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October 2024

FINAL
Environmental Impact Statement

for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)

VOLUME 3
Appendix E: Comment Response Document

U.S. Department of Energy
Office of Nuclear Energy

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Reader's Guide

This Comment Response Document (CRD) portion of this *Final Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)* (the "HALEU EIS") (DOE/EIS-0559) consists of four sections.

Section 1 – Overview of the Public Comment Process

This section describes the public comment process for the Draft HALEU EIS; the format used in the public hearings; the organization of this CRD, and the changes made to the Draft EIS in response to comments received.

Section 2 – Topics of Interest

This section presents summaries of topics identified from the public comments received on the Draft HALEU EIS and DOE's response to each issue.

Section 3 – Public Comments and DOE Responses

This section presents a side-by-side display of all of the comments received by DOE on the Draft HALEU EIS and DOE's response to each comment. The comments were obtained at public hearings on the Draft HALEU EIS; during Tribal Listening Sessions; and via email, U.S. mail, or through www.regulations.gov.

Section 4 – Scoping Comment Summary

This section present summaries of public comments received during the initial scoping period.

Section 5 – References

This section contains the references cited throughout this CRD.

To Find a Specific Comment and DOE Response

Refer to the "List of Commenters" immediately following the Table of Contents. This list is organized alphabetically by commenter name and shows the corresponding page number(s) where commenters can find their comment(s).

DOE has made a good faith effort to interpret the spelling of names that were either hand-written on comment forms and letters, or transcribed from oral statements made during public hearings.

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List of Commenters

Public Officials, Organizations, and Interest Groups

Individuals

Acronyms and Abbreviations

ACO	American Centrifuge Operating, LLC
ANR	Advanced Nuclear Reactor
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CO_2e	carbon dioxide equivalent
CRD	Comment Response Document
DOE	U.S. Department of Energy
DOE-NE	DOE Office of Nuclear Energy
DU	depleted uranium
DUF_6	depleted uranium hexafluoride
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ET	Eastern Time
Fed. Reg.	Federal Register
g	gram
GHG	greenhouse gas
HALEU	high-assay low-enriched uranium
HEU	highly enriched uranium
IAEA	International Atomic Energy Agency
ISR	in-situ recovery
kWh	kilowatt-hour
LEU	low-enriched uranium
LWR	light water reactor
MT	Metric Ton
MW-h	megawatt-hour
NEPA	National Environmental Policy Act
NOA	Notice of Availability
NOI	Notice of Intent
NRC	U.S. Nuclear Regulatory Commission
NTSF	National Transportation Stakeholders Forum
Pub. L.	Public Law
rem	roentgen equivalent man
RFI	*Request for Information Regarding the Establishment of a Program to Support the Availability of High-Assay Low-Enriched Uranium for Civilian Domestic Research, Development, Demonstration, and Commercial Use*
ROD	Record of Decision
SME	subject matter expert
SNF	spent nuclear fuel
SRS	Savannah River Site
TEPP	Transportation Emergency Preparedness Program
U-235	uranium-235
UF_6	uranium hexafluoride
USDOT	U.S. Department of Transportation

SECTION 1
OVERVIEW OF THE PUBLIC COMMENT PROCESS

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1.0 Overview of the Public Comment Process

This section of this Comment Response Document (CRD) describes the public comment process for the *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)* (the "Draft HALEU EIS") and the procedures used to respond to those comments. Section 1.1 describes the public comment process and the means of receiving comments on the Draft HALEU EIS. It also identifies the comment period and the locations and dates of the public hearings on the Draft HALEU EIS. Section 1.2 addresses the public hearing format. Section 1.3 describes the organization of this CRD, including how the comments were categorized, addressed, and documented. Section 1.4 summarizes the changes made to the Environmental Impact Statement (EIS) that resulted from the public comment process and developments that occurred since publication of the Draft HALEU EIS. Section 1.5 summarizes the next steps the U.S. Department of Energy (DOE) will take after publication of this Final HALEU EIS.

Comment document – A communication in the form of an electronic statement (website entry, document upload, or email), a letter, transcript, or written comment from a public hearing or Tribal Listening Session that contains comments from a Tribe, government agency, organization, or member of the public regarding the Draft HALEU EIS.

Comment – A statement or question regarding Draft HALEU EIS content that conveys approval or disapproval of proposed actions, recommends changes, or seeks additional information.

Response – DOE's answer to a statement or question; an explanation of a topic raised by a comment.

1.1 Public Comment Process

DOE prepared the Draft HALEU EIS in accordance with the National Environmental Policy Act of 1969 (NEPA), Public Law (Pub. L.) 91-190, 83 Stat. 852, codified at 42 U.S.C. §4321, and in compliance with Council on Environmental Quality (CEQ) regulations, 40 Code of Federal Regulations (C.F.R.) §1500, and DOE NEPA Implementing Procedures (10 C.F.R. §1021). An important part of the NEPA process is solicitation of public comments on a draft EIS and consideration of those comments in preparing a final EIS.

On March 8, 2024, the U.S. Environmental Protection Agency (EPA) published a Notice of Availability (NOA) for the Draft HALEU EIS, 89 *Federal Register* (Fed. Reg.) 16,765 (Mar. 8, 2024), (see Volume 2, Appendix C, *Federal Register Notices*). Publication of the NOA initiated a 45-day public comment period.

Notices of the public comment period and three virtual public hearings were published as press releases, email notifications, DOE Office of Nuclear Energy (DOE-NE) social media posts, and in newspaper outlets in states with historic ties to nuclear energy production activities (i.e., Arizona, Colorado, Idaho, Illinois, Nebraska, New Mexico, North Carolina, Ohio, South Dakota, Tennessee, Texas, Utah, Virginia, and Wyoming). A national notice was also distributed through USA Today to ensure maximum coverage. Additionally, notices of the three Tribal Listening Sessions were distributed as formal letters to all 574 federally recognized Tribes and published in newspaper outlets in states with Tribes historically impacted by uranium mining and milling (e.g., Arizona, New Mexico, Wyoming, Utah, Texas) as well as other states with large Tribal populations (e.g., Oklahoman, California, Nevada, Washington, and South Dakota). Regional and national notices were also published to ensure maximum coverage for Tribal communities.

DOE-NE hosted three consecutive virtual public hearings at 6:00 p.m. Eastern Time (ET), 8:00 p.m. ET, and 10:00 p.m. ET on April 3, 2024. Due to the national scope of this EIS, virtual meetings were chosen to promote accessibility across the country and were scheduled to accommodate different time zones. The purpose of these hearings was both to explain the process used to analyze the Proposed Action and alternatives, and to provide opportunities for the public to submit comments on the Draft HALEU EIS. DOE-NE also hosted two virtual Tribal Listening Sessions: 6:00 p.m. ET on Wednesday, April 10, 2024, and 8:00 p.m. ET on Thursday, April 11, 2024, as well as one in-person Tribal Listening Session at 5:30 p.m. Mountain Time on Tuesday, April 16, 2024. Similar to the public hearings, virtual listening sessions were

chosen to promote accessibility across the country and were scheduled to accommodate different time zones. The in-person meeting was held in cooperation with an existing Tribal conference with national attendance to increase participation and attendance of Tribal communities. The purpose of these listening sessions was to meaningfully engage with communities historically marginalized by the uranium industry and listen to Tribal questions, concerns, and formal comments regarding the analysis provided in the Draft HALEU EIS.

DOE ensured that all virtual hearings and listening sessions had a call-in number to facilitate participation if internet access was intermittent or not available. For those unable to attend hearings or listening sessions, recordings were posted on the project website. Due to the national scope of this EIS, DOE uploaded Spanish closed captioning to the public hearing recordings to accommodate linguistically isolated populations. The hearings also included an American Sign Language interpreter both during the live events as well as in the uploaded recordings. DOE was prepared to make Tribal language accommodations, but did not receive any translation requests for the Tribal Listening Session materials. Both the public hearings and Tribal Listening Sessions were an important component of DOE's continued efforts to provide stakeholders, the public, and Tribes with opportunities to participate in the NEPA process.

In addition to providing oral comments at the public hearings and/or Tribal Listening Sessions, interested parties were informed that they could provide written comments by email to HALEU-EIS@nuclear.energy.gov, or by U.S. mail to Mr. James Lovejoy, DOE EIS Document Manager, U.S. Department of Energy, Idaho Operations Office, 1955 Fremont Avenue, MS 1235, Idaho Falls, ID 83415.

Upon receipt, all written comment documents were assigned a document number for tracking during the comment response process. Each commenter's name in the transcripts from the public hearings also was assigned a document number. All comment documents were then processed for inclusion in this CRD. In processing the comment documents, each document was analyzed to identify individual comments (which were numbered sequentially) and DOE prepared responses to each numbered comment. In preparing this Final HALEU EIS, DOE responded to all comments received, including the few received after the end of the comment period. Comments that DOE determined to be outside the scope of the HALEU EIS are acknowledged as such in this CRD. The remaining comments were then reviewed and responded to by policy experts, subject matter experts (SMEs), and NEPA specialists, as appropriate. This CRD presents the comment documents, including the campaigns[1], as well as the public hearing and Tribal Listening Session transcripts and DOE's responses to the comments in these documents. Figure 1-1 illustrates the process used for collecting, tracking, and responding to the comments.

The comments and DOE responses were compiled in a side-by-side format, with each identified comment receiving a separate response. All comments and responses are numbered with a comment identification number to facilitate matching a comment with its response.

During preparation of this Final HALEU EIS, all comments received on the Draft HALEU EIS were considered. This effort served to focus the revision process and ensure consistency throughout the final document. The comments assisted in determining whether the alternatives and analyses presented in the Draft HALEU EIS should be modified or augmented, whether information presented in the Draft HALEU EIS needed to be corrected or updated, and whether additional clarification was necessary to facilitate better understanding of certain issues. Change bars in the margins of pages in the Summary and Volumes 1 and 2 of this Final HALEU EIS indicate where substantive changes were made and where text was added or deleted. Editorial changes are not marked.

[1] A comment document was considered to be part of a campaign if a number of comment documents were received with the same text appearing in the body of the comment.

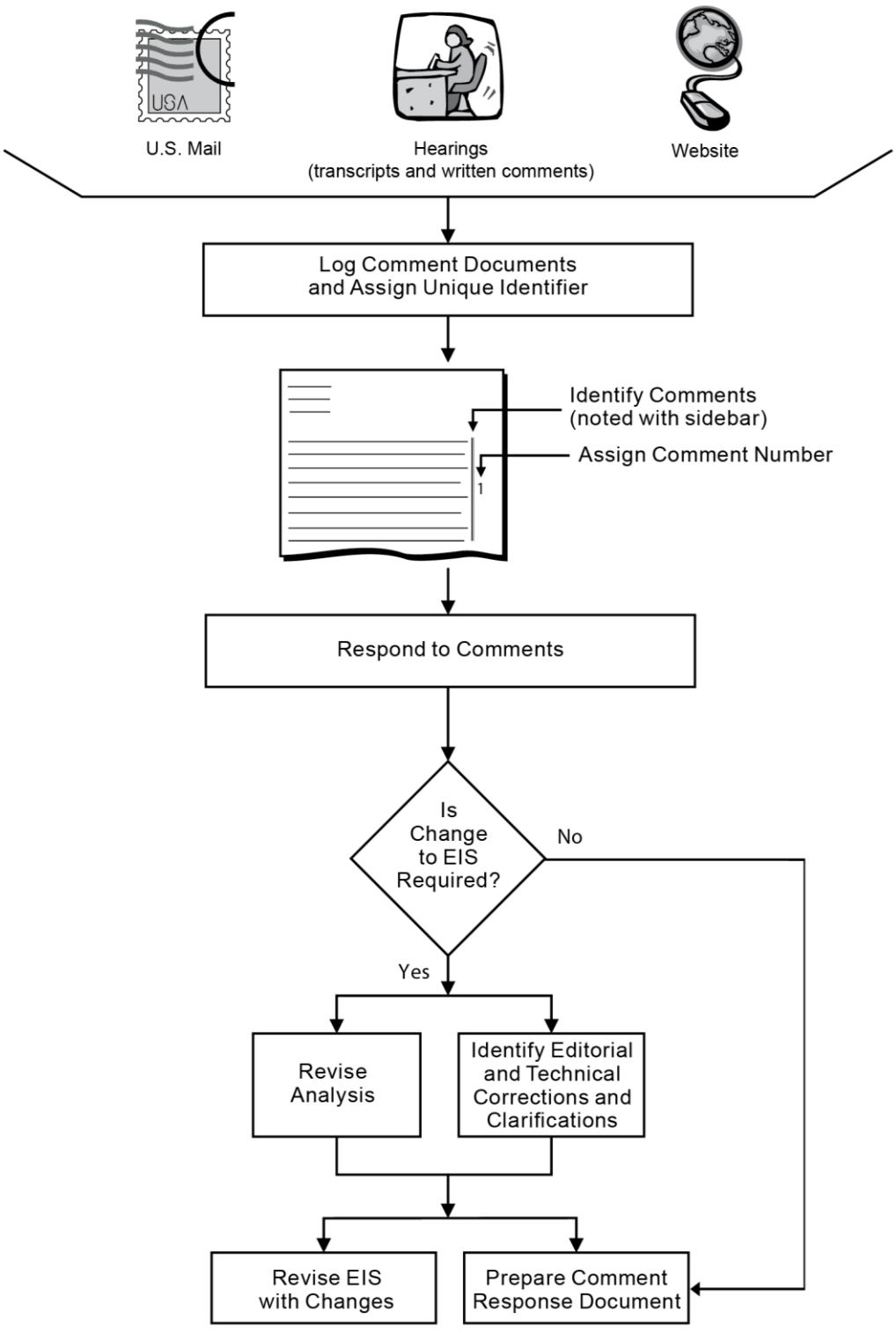

Figure 1-1. Comment Response Process for the Final High-Assay Low-Enriched Uranium Environmental Impact Statement

1.2 Public Hearing and Tribal Listening Session Format

The public hearings and Tribal Listening Sessions were designed to offer information about the NEPA process, DOE's Proposed Action, and the analysis of alternatives results presented in the Draft HALEU EIS. DOE also invited public and Tribal comments on the document at these respective meetings. A court reporter recorded and prepared a transcript of the comments that were presented at each meeting. These transcripts are included in Section 3 of this CRD.

At the public hearings, the DOE HALEU Program Manager opened the hearings with a pre-recorded presentation that included welcoming remarks, information about the HALEU project, and gave an overview of the Draft HALEU EIS and the NEPA process. After the pre-recorded presentation, a meeting moderator opened the comment session. A time limit was established to ensure that everyone who wished to speak would have an opportunity to provide oral comments. Everyone who was asked to conclude their remarks to comply with the time limitation was encouraged to submit additional comments in writing. After all commenters were provided an opportunity to comment, the remaining hearing time was used to give commenters the opportunity to provide additional comments.

The Tribal Listening Sessions were conducted in a similar manner; however, the presentation was not prerecorded, and commenters were not limited by time or length of their comments. The sessions also included a question-and-answer event with DOE management staff, which was facilitated by the moderator. Questions asked during this event were not accepted as formal comments on the Draft HALEU EIS, and participants were requested to reiterate their questions in the form of a comment during the oral comment period if interested in submitting it for the formal record. Questions and answers during this session are available for review in the Tribal Listening Session transcripts. The formal comment period followed the question and answer event. Methods for submitting written comments were also provided during these sessions.

As part of the comment response process, the transcripts collected at both the hearings and Tribal Listening Sessions were reviewed for comments on the Draft HALEU EIS, as described in Section 1.1 of this CRD.

1.3 Organization of this Comment Response Document

This CRD is organized into the following sections:

- Section 1 describes the public comment process for the Draft HALEU EIS, the format used in the hearings and Tribal Listening Sessions, the organization of this CRD, and the changes made to the Draft HALEU EIS in response to comments received.
- Section 2 presents topics of interest that appeared frequently in the public comments received on the Draft HALEU EIS as well as DOE's response to each topic.
- Section 3 presents comment documents, received via email and U.S. mail, and the transcripts of the oral comments, received during the hearings and Tribal Listening Sessions. The comment documents and DOE's responses to the comments delineated within each comment document are presented side by side.
- Section 4 presents summaries of public comments received during the initial scoping period.
- Section 5 lists the references cited in this CRD. The references are available via https://www.energy.gov/ne/haleu-environmental-impact-statement.

1.4 Changes to the *Draft High-Assay Low-Enriched Uranium Environmental Impact Statement*

In preparing this Final HALEU EIS, DOE revised the Draft HALEU EIS in response to comments received from other Federal agencies and state and local government entities; Tribes; and the public. In addition, DOE updated information due to events or the availability of information in other documents that were not completed in time to be incorporated into the Draft HALEU EIS. DOE also revised the EIS to provide more-recent environmental baseline information, updated project data, and revised consequence analyses, as well as to correct inaccuracies, make editorial corrections, and clarify text. Vertical change bars appear alongside such changes in the Summary and Volumes 1 and 2 of this Final HALEU EIS. Editorial changes are not marked. The following descriptions summarize the major changes made to the Final HALEU EIS.

- Some commenters wanted DOE to evaluate the past, current, and future impacts of specific mining and milling operations along with include a discussion of legacy issues associated with past mining and milling activities.
    - DOE recognizes the concerns, but also emphasizes that the Proposed Action is to fund enrichment of uranium to make HALEU. Uranium for those activities would be purchased not by DOE, but by others from the commercial United States, North American, and worldwide markets.
        - For the Final HALEU EIS, more emphasis has been placed on the use of open-market, commercial uranium. While the EIS attempts to report impacts from the entire HALEU fuel cycle, the commercial purchase of uranium as feed for the enrichment plants would come from the same types of sources as feed for existing enrichment plants that support existing low-enriched uranium (LEU)-fueled reactors. At least for the near-term, or reasonably foreseeable future, the uranium demand for HALEU-fueled reactors would be a fraction of the demand for uranium for LEU-fueled reactors.
        - Legacy issues associated with past uranium mining, milling, and enrichment activities are discussed in Section 2.4 of this CRD. This Final HALEU EIS does not support the selection of specific sites for the HALEU fuel cycle activities. Legacy issues associated with past operations at specific sites are not within the scope of this EIS.
        - To project the cradle-to-grave impacts of DOE's Proposed Action, the SMEs supporting this EIS used the available environmental impact information from a few sites to project the impacts that would be associated with HALEU from the on-going uranium mining, milling, and conversion operations. DOE recognizes that there are a wide range of operations and impacts, and that ore and uranium hexafluoride for HALEU may come from outside the United States. More details on the assumptions and impacts associated with uranium mining, milling, and uranium enrichment are presented in Vol. 1, Sections 3.1 and 3.3, and Vol. 2, Sections A.1 and A.3, of this EIS, and Sections 1 and 3 of the **Technical Report (Leidos, 2023)**.
- Some commenters wanted DOE to more thoroughly evaluate the specific impacts of sites that would support the Proposed Action. More detailed and/or specific impact areas that commenters thought were needed included water resources (including waste water, storm water, aquifers, National Pollutant Discharge Elimination System requirements, etc.), land use, air impacts (including specific impacts of greenhouse gases by species), impacts on the site and facility due to climate change, detailed environmental justice impacts for specific sites, and transportation impacts.

- DOE recognizes the desire to include detailed impact evaluations of specific sites, but the selection of specific locations and facilities will not be a part of the Record of Decision for this EIS. The decisions to be supported are whether or not to acquire HALEU from commercial sources and to facilitate commercial HALEU fuel production capability.
  - DOE added more emphasis on the analysis approach in the Final HALEU EIS to (1) explain why the desire for specific-site evaluations was not reasonable, and (2) explain how a surrogate method that uses assessments by SMEs of available information to project the impacts of HALEU production was more reasonable. See Vol. 1, Sections 3.0.1, *Approach to Impact Analysis*, and 3.0.2, *Assumptions*, and Vol. 2, *Environmental Consequences Supporting Information*, for more information.

- Some commenters appeared to not understand that the impacts summarized in the Summary and Vol. 1, Chapter 2, tables were for impact areas that might not fall into the "SMALL" category and there was more detail elsewhere in the EIS.
  - DOE modified the Final HALEU EIS to better describe the overall approach to develop the impact ratings by subject area and emphasize the large body of backup information developed to support the ratings reported in the Summary and Vol. 1, Chapter 2, tables.
    - That backup information included detailed analyses in Vol. 2, Appendix A, and the Technical Report (Leidos, 2023).
    - The Final HALEU EIS was modified to include more emphasis on the Technical Report. Hot links throughout the Final HALEU EIS and specific hot links in appropriate impact areas and Appendix A were added that lead directly to specific supporting sections in the Technical Report.
      - The Technical Report is a 500+-page report that contains summary information from NEPA documentation addressing construction and operation of existing and proposed fuel cycle (mainly LEU fuel cycle) facilities used to develop the information regarding the impacts of the Proposed Action provided in the appendices, Vol. 1 chapters, and Summary of this EIS. This report summarizes relevant environmental impact information from these documents and provides the assessment of how these impacts could be used to assess impacts associated with the Proposed Action. Information is provided for the Proposed Action and related pre- and post-action activities (mining and milling, conversion, enrichment, deconversion, storage, fuel fabrication, and fuel use at advanced reactors). Impact assessments for all resource areas are provided.

- Some commenters requested information on impacts that DOE considers speculative.
  - DOE recognizes the desire to better understand the impacts of reasonably foreseeable activities if the Proposed Action to support HALEU succeeds and had attempted to project those impacts in Vol. 1, Chapters 3 and 4, and Vol. 2, Appendix A. Some detailed, longer-term impacts are not reasonably foreseeable and are considered speculative. DOE has enhanced the discussion of why such impacts are speculative and not appropriate for analysis in the Final HALEU EIS.

- Some commenters expressed concerns about managing radioactive waste, including waste associated with reactor disposition and spent nuclear fuel (SNF). These concerns included the potential for SNF storage at reactor locations or interim storage facilities and the lack of long-term solutions for the management and disposition of SNF. Some commenters expressed legacy waste management concerns and concerns about the depleted uranium hexafluoride (DUF_6) byproduct from uranium enrichment.

  - DOE acknowledges the concerns and includes a discussion on radioactive waste, SNF management, and disposal in Section 2.5 of this CRD, which provides an overview and references to the various sections throughout the EIS that address those topics.

- Some commenters expressed nonproliferation concerns associated with use and misuse of HALEU and supporting technologies with the implementation of the Proposed Action.
  - DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of LEU. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and the benefits of the use of HALEU in advanced reactors outweighs the potential proliferation risks. Both the U.S. Nuclear Regulatory Commission (NRC) (domestically) and the International Atomic Energy Agency (IAEA) (internationally) have addressed the use of HALEU fuel and have implemented appropriate controls. DOE has updated Vol. 1, Section 3.9, of this Final HALEU EIS to address the concerns. Also, see Section 2.3, *Nonproliferation and Terrorism*, of this CRD.

1.5 Next Steps

DOE will use the analysis presented in this Final HALEU EIS, as well as other information, in preparing one or more Records of Decision (RODs) for the Proposed Action. DOE will issue a ROD no sooner than 30 days after the EPA publication of the NOA of this Final HALEU EIS in the *Federal Register*.

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SECTION 2
TOPICS OF INTEREST

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2.0 Topics of Interest

Upon review of the comments received on the Draft HALEU EIS, DOE identified several topics of interest to be addressed in this section of the Comment Response Document (CRD). These include topics of broad interest or concern as indicated by their recurrence in comments or technical topics that warrant a more detailed discussion than might be afforded in responding to an individual comment. This section summarizes the comments received on this subset of topics, followed by DOE's response:

- Support and Opposition
- Purpose and Need
- Nonproliferation and Terrorism
- Legacy Issues
- Radioactive Wastes and Spent Nuclear Fuel Management and Disposal
- Transportation
- NEPA Process
- Out of Scope

In addition to the provided responses here in Section 2.1, *Support and Opposition*, through Section 2.8, *Out of Scope*, individual responses to comments are contained in Section 3 of the CRD.

2.1 Support and Opposition

Comments Summary

Many commenters included a statement of support or opposition to the Proposed Action, often including concerns to support their position. In general, commenters in support expressed:

- General support for the Proposed Action;
- Support for faster environmental review timelines; and
- Support for the use of existing NEPA documentation in the impacts analysis.

Many of those in favor of the Proposed Action cited HALEU's role in decarbonization and clean energy efforts, citing both the need to meet national and global greenhouse gas emission and climate goals. Other commenters supported DOE's use of existing NEPA documentation for current LEU activities in its analysis, DOE's commitment to end foreign reliance on imported uranium and foster a domestic supply of HALEU production, and DOE's responsibilities under the Energy Act of 2020.

Those in opposition expressed concerns regarding several aspects of the Proposed Action:

- General opposition to the Proposed Action or support for the No Action Alternative.
- Cost – In addition to concerns about the total cost of implementing the Proposed Action, some commenters expressed the desire to see the money spent on renewable energy technologies and for the money to come from sources other than government subsidies or taxpayer dollars.
- SNF and nuclear waste management – Commenters expressed concerns about the longevity, and long-term management, of radioactive waste as well as SNF that would be generated; other commenters expressed opposition because a permanent SNF storage facility does not exist.

- Reactor technologies – Commenters expressed distrust in the viability of new reactor technologies due to concerns that small modular reactors are speculative technologies at this time and may not come online fast enough to be an effective climate solution.
- Environmental impacts – Commenters expressed concern about the environmental impacts associated with HALEU activities.
- Proliferation – Commenters expressed concerns about global security risks and potential proliferation implications of HALEU because of its 19.75% uranium-235 (U-235) enrichment.

DOE Response

DOE acknowledges the commenters' preferences regarding DOE activities related to the Proposed Action. There were a variety of preferences expressed, some generally in favor of the Proposed Action and some opposed. DOE considers every comment equally in the EIS process regardless of the number of comments received for or against a project. DOE reiterates CEQ statement that says, "Commenting is not a form of 'voting' on an alternative" (CEQ, 2021). The number of comments received for or against a particular alternative does not dictate the action that a Federal agency must take.

The preferred alternative reflects DOE's position at the time the Final HALEU EIS is issued; however, it does not reflect the final decision by DOE. DOE will announce its final decision in the ROD issued no sooner than 30 days after publication in the *Federal Register* of the U.S. Environmental Protection Agency (EPA) NOA for this Final HALEU EIS.

DOE considered all comments received on the Draft HALEU EIS in the development of this Final HALEU EIS. In stating their preference for or against the Proposed Action, many commenters identified issues in support of their preference. Issues identified by multiple commenters in opposition to the Proposed Action, or that involved complex technical issues, were addressed in separate topics in this section of the CRD. Readers can refer to Sections 2.1 through 2.8 for detailed discussions of those issues. Other issues raised by the commenters are discussed further as individual comments and responses in the CRD.

Many commenters expressed opposition in preference for an alternative in which the funding allocated for HALEU is invested into renewable energy technologies. Commenters also expressed concerns about the total cost of the Proposed Action.

The purpose and need for the Proposed Action is met by a narrowly defined scope of activities. Because the purpose and need (as discussed in Section 1.1 of Volume 1 of this EIS) for the Proposed Action is specifically related to HALEU availability (primarily for energy production), alternative energy (or electrical production capabilities) such as wind and solar power would not meet the identified purpose and need. Therefore, such alternatives were not considered in this EIS. Vol. 1, Chapter 2, specifically Section 2.4, of this EIS further discusses alternatives considered and dismissed from analysis.

As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Support and funding for nuclear energy versus renewable energy technologies is outside the scope of this EIS. In statements expressing opposition to the Proposed Action, commenters made general reference to environmental concerns.

Vol. 1, Chapter 3 of the Final HALEU EIS addresses the environmental impacts associated with the Proposed Action and No Action Alternative where impacts are characterized as having potential MODERATE and LARGE impact ratings. Resources characterized with SMALL impacts are addressed in the Appendices and the Technical Report (Leidos, 2023). In addition to the general concerns expressed, these commenters often provided additional, more specific concerns (e.g., identifying a specific resource concern). For these specific environmental concerns, the commenter is referred to the individual comment response provided in this CRD.

Several commenters mentioned that Advanced Nuclear Reactors (ANRs) have not been licensed or built and, therefore, cannot prove clean energy viability. Additionally, commenters stated that slow construction and licensing timelines would not allow ANRs to be effective in combatting climate change or carbon emission reduction goals in a timely manner.

DOE developed the Proposed Action based on Congressional direction in the Energy Act of 2020 and DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final HALEU EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Please refer to Section 2.2, *Purpose and Need*, of this CRD for further discussion of this topic.

In this EIS, DOE identifies projected demand for HALEU through 2050 (see Vol. 1, Section 1.1, *Purpose and Need*). Further, many carbon emission goals are targeted to the year 2050, more than two decades from now. The United Nations has publicly stated to keep global warming to no more than 1.5°C—as called for in the Paris Agreement—emissions need to be reduced by 45% by 2030 and reach net zero by 2050. President Biden's Executive Order 14057 on catalyzing American clean energy industries and jobs through Federal sustainability and accompanying Federal Sustainability Plan (collectively referred to as "The Federal Sustainability Plan") outlines a path to achieve net-zero emissions across Federal operations by 2050, Executive Order No. 14057, 86 Fed. Reg. 70,935 (2021). The White House has also set the goal of achieving a net-zero emissions economy by 2050. Advanced nuclear reactors can be one of the technologies employed to help eliminate fossil fuel dependance and address carbon emission reduction and climate change goals. In support of this position, the EIS cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050 (International Energy Agency, 2021).

ANR designs are being developed and parameters have been identified to aid in licensing these reactors. The NRC is involved in the licensing process for potential HALEU-fueled ANRs which will encourage construction of future reactors. As explained in Section 1.1 of the EIS,

DOE projects that more than 40 metric tons (MT) of HALEU will be needed by 2030 with additional amounts required each year thereafter to deploy a new fleet of advanced reactors in a timeframe that supports the Administration's 2050 net-zero emissions target (DOE, n.d.). DOE also predicts that commercial demand will increase to over 50 MT per year of HALEU by 2035 and over 500 MT of HALEU per year by 2050. As indicated by many commercial entities that responded to DOE's *Request for Information (RFI) Regarding Planning for Establishment of a Program to Support the Availability of High-Assay Low Enriched Uranium (HALEU) for Civilian Domestic Research, Development, Demonstration, and Commercial Use*, 86 Fed. Reg. 71,055 (Dec. 14, 2021), (referred to as the "RFI"), there is a potential timing/coordination issue with developing domestic commercial HALEU enrichment capability. Those interested in designing, building, and operating advanced reactor designs that use HALEU fuel are hesitant to invest in the technology without a firm source of HALEU fuel. Likewise, those interested in providing HALEU fuel are hesitant to invest in facilities without a firm demand. As described in multiple responses to the RFI, this is a "chicken-and-egg" dilemma.

Development of a domestic HALEU supply chain would support development of HALEU-fueled reactors. Chapter 8, *Reactor Operations with HALEU*, of the **Technical Report (Leidos, 2023)** further discusses HALEU fueled reactors and their potential impacts.

2.2 Purpose and Need

Comments Summary

Commenters questioned the need for HALEU stating that DOE's analysis is based on speculative nuclear power plant projects that will likely never be built. Commenters used the cancellation of the Utah Associated Municipal Power Systems small modular reactors as an example of projects not being built.

DOE Response

Vol. 1, Section 1.1, of the Final HALEU EIS has been updated to describe the Purpose and Need more clearly. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act of 2020 and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors.

DOE's Proposed Action is rooted in direction received from Congress via the Energy Act of 2020, specifically Section 2001(a)(2)(D)(v). On a broad level, the Energy Act of 2020 directs DOE to establish and carry out, through DOE-NE, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026, 42 U.S.C. §16281(a)(1); (2)(H). More narrowly, Section 2001(a)(2)(D)(v) of the Energy Act specifically directs DOE to consider using enrichment technology to make HALEU available for commercial use or demonstration projects, where such HALEU is produced in the United States by—(I) a United States-owned commercial entity operating United States-origin technology; (II) a United States-owned commercial entity operating a foreign-origin technology; or (III) a foreign-owned entity operating a foreign-origin technology, 42 U.S.C. §16281(a)(2)(D)(v). DOE developed the Proposed Action based on this direction, as well as DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a domestic HALEU fuel cycle.

HALEU is not sufficiently available from domestic suppliers, and gaps in supply could delay the deployment of advanced reactors. In addition to clarifying this information in the EIS, DOE has clarified that the estimates provided in the EIS reflect available estimates for potential future demand.

Regarding comments about speculative nuclear power plant projects that will likely never be built, the estimated amount of HALEU that may be needed to power future advanced reactors described in this EIS, was based on best available data at the time the EIS was being prepared. Note the Utah Associated Municipal Power Systems small modular reactors, cited by a commenter as an example of cancelled nuclear projects, would have been powered by low enriched uranium fuel similar to that used in existing commercial light water reactors, and would not have been powered by the HALEU analyzed in this EIS.

2.3 Nonproliferation[2] and Terrorism

Comments Summary

DOE received 36 comments from individuals expressing concerns that the Proposed Action (as presented in the Draft HALEU EIS) would increase the risks of nuclear proliferation and terrorism. In addition, during the scoping period for the EIS, DOE received 26 comments from 13 individuals, including 10 individuals representing organizations, requesting that the EIS scope include consideration of United States and

[2] Nuclear proliferation is the spread of nuclear weapons, nuclear weapons technology, or fissile material to countries that do not already possess them. Therefore, in this context, nonproliferation is preventing nuclear proliferation.

international proliferation and nonproliferation concerns associated with use and misuse of HALEU and supporting technologies with the implementation of the Proposed Action. In response to the scoping comments, DOE presented a detailed discussion on nonproliferation and terrorism concerns in Vol. 1, Section 3.9, of the EIS that addressed the issues identified during scoping. The comments and concerns received on the Draft HALEU EIS were generally similar to those received during scoping—namely, that implementation of the Proposed Action would increase the risk of nuclear proliferation and terrorism.

- One organization requested, as they did during scoping, that DOE prepare a Nonproliferation Impact Assessment on the Proposed Action and any alternatives to it. Another group stated, "It is incumbent on DOE as part of [its] federally mandated HALEU planning, to assess and report back to Congress on the potential proliferation dangers of this technology."
- One organization filed comments after the Draft HALEU EIS comment period closed asking that DOE reconsider their request to prepare a Nonproliferation Impact Assessment based on the June 7, 2024, publication of a Policy Forum article in the journal Science, "The weapons potential of high-assay low-enriched uranium" (Kemp et al., 2024). That article argues that Congress should direct DOE/NNSA to "commission a fresh review of HALEU proliferation and security risks by US weapons laboratory experts." The concerns and recommendations of this article have now been repeated by several other organizations that presented both scoping and Draft HALEU EIS comments.
- Groups also repeated the concerns expressed during scoping that DOE follow the recommendations of the National Academies of Science (NAS, 2023), who studied advanced reactors and reviewed many topics, including the proliferation impacts of the use of HALEU fuel.
- The remaining concerns generally argued that HALEU posed proliferation risks that could lead to the spread of enrichment technology, weapons, and terrorism. These concerns were addressed in Vol. 1, Section 3.9, of this EIS.

One group offered praise in this area, indicating that the benefits of using HALEU in advanced reactor fuels outweigh any potential proliferation risks. They indicated that, as discussed in Section 3.9 of the Draft HALEU EIS, they agreed with DOE's conclusion that adequate controls exist to reduce the proliferation concerns to acceptable levels, and that the benefits of using HALEU in advanced reactor fuels outweigh the potential proliferation risks.

DOE Response

The scoping process proved effective and provided DOE with a full range of comments on the potential impacts of the Proposed Action on nonproliferation and terrorism. As a result, Section 3.9 of the EIS was prepared by DOE to ensure that these issues and concerns were addressed, and further addresses concerns about a new Nonproliferation Impact Assessment on HALEU. Almost all of the comments received on the Draft HALEU EIS included information or ideas that DOE had already considered as it was preparing the Draft HALEU EIS, but one new comment received requested that DOE follow the recommendations presented in the journal Science article (Kemp et al., 2024). DOE has updated Section 3.9 of the Final HALEU EIS to acknowledge the concerns and recommendations presented in the journal Science article (Kemp et al., 2024).

DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation concerns than the use of both HEU and LEU. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE

assesses that adequate structures are in place to reduce the evolving proliferation concerns to acceptable levels and the benefits of using HALEU in advanced reactors outweigh the potential proliferation risks. Both the NRC (domestically) and the International Atomic Energy Agency (internationally) have addressed the use of HALEU fuel and have implemented appropriate controls. Domestically, the NRC requires that inventories of 10 kilograms or more of uranium enriched between 10% and less than 20% U-235 are designated as NRC Category II, special nuclear material of moderate strategic significance. Details of the NRC requirements for HALEU NRC Category II material are specified in the NRC's *Fuel Cycle: Physical Security Requirements for Facilities with Category II Special Nuclear Material Information Sheet* (NRC, 2023a). The NRC staff have reviewed its regulatory framework, to include requirements in Title 10 of the Code of Federal Regulations and supplemental security measures issued through license conditions, and concluded that, taken together, they are sufficient to provide reasonable assurance of adequate protection of public health and safety with regard to HALEU. DOE has been using HALEU for nonproliferation purposes as a substitute for highly enriched uranium (HEU) in research reactors worldwide for decades and is aware of the proliferation risks and benefits of the production, transportation, and uses of HALEU. DOE has examined the security impacts of increased use of HALEU in two representative designs as compared to LEU in current nuclear power plants, and concluded that there is no significant change in the sabotage risk profile for HALEU. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in advanced small modular reactors, and will work with civil nuclear stakeholders to address any new risks that are identified.

2.4 Legacy Issues

Comments Summary

Many commenters expressed the opinion that this EIS should address legacy impacts at many of the fuel cycle sites whose NEPA documentation was used to develop the impacts analysis. Furthermore, commenters highlighted the disproportionate impacts from these activities that Tribes historically and currently face. In particular, legacy impacts were identified at many of the sites associated with mining and milling, at the site of the former Portsmouth Gaseous Diffusion Plant, and at the BWX Technologies, Inc. facility in Erwin, Tennessee. Commenters also expressed the opinion that the legacy impacts should be used to assess future operations at the fuel cycle facilities. Most of the comments were directed toward the legacy impacts of mining and milling, which disproportionately affect Tribes.

DOE Response

As stated in the HALEU EIS, this is not a decision document for the selection of specific sites for HALEU fuel cycle facilities. As stated in Vol. 1, Section 1.6, of this EIS, "This EIS provides information to support a decision regarding whether to:

(1) Facilitate the establishment of commercial HALEU fuel production capability.

(2) Acquire (through procurement of HALEU as enriched uranium hexafluoride and deconversion services) from commercial sources, up to 290 MT of HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance."

Because specific sites are not being analyzed for this EIS, the information used in the assessment is predominantly impacts information from analyses of sites at which activities, or similar activities, have been performed in the past. This existing information was then assessed by subject matter experts to

forecast the potential impacts associated with fuel cycle activities at existing facilities, brownfield and greenfield sites. Multiple sites were used in collecting this information. The sites used for analysis were based on the availability of NEPA documentation and do not indicate any preference for the use of a site to implement the Proposed Action. Given the lack of site-specific information and the range of potential locations for all of the fuel cycle facilities, collection and analysis of affected environment information (e.g., legacy impacts, monitoring data, etc.) at existing sites would not be a reasonable undertaking. Additionally, much of the information would also ultimately not be relevant to any future environmental review of future specific-site activities. Thus, a full discussion of the existing environments and the impact on those existing environments, including legacy impacts, is best left to site-specific environmental analysis under the relevant regulatory authority. However, due to the public interest in legacy impacts, a brief discussion has been incorporated into Vol. 2, Appendix A, of the Final HALEU EIS for both mining/milling and enrichment. This discussion is not meant to be encyclopedic (more information would be expected in site-specific documentation), but rather to provide a perspective on impacts and public concerns resulting from past practices.

Additionally, DOE does not believe that past impacts would be an appropriate representation of potential impacts. Using the past experience as the basis for the future impacts from the HALEU fuel cycle would likely overestimate potential impacts because past fuel cycle activities were conducted under a different regulatory regime that is not fully representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring fuel cycle facilities are generally expected to be more stringent than historic practices. An example of such a current requirement is the Mine Safety and Health Administration limit of worker exposures to less than 4 working-level months per year. (The working-level month is when human lungs have been exposed for 170 hours [a typical month's work] to air which has 3.7 kilobecquerel of radon-222.) To reduce worker exposures and keep below these limits, mine operators have instituted improved mine ventilation systems and the use of personal protective equipment. Additionally, one of the source NEPA documents used to support the analysis of mining impacts in the HALEU EIS was the *Draft Environmental Impact Statement for Roca Honda Mine* (USDA, 2013)(from Vol. 2 of the HALEU EIS).

This HALEU EIS had an extensive discussion of the existing human health environment, including those that can be considered legacy health issues. Mitigative measures that would be available for future mining operations, and that were not employed in the past, were identified to limit the exposure of the local (non-worker) population and minimize health impacts, primarily by limiting non-workers to mine related dust. Workers would not take work clothes home and would be able to shower before leaving the mine. Trucks transporting ore would be sprayed down and the cargo area securely covered prior to leaving the mine. (All water from showers and truck cleaning would be collected and treated before being released for use.) Additional best management practices could also be employed. Worker protections include improved mine ventilation (lowering the radon concentration in the mine air) and the use of personal protective equipment. These protections would be used to limit worker exposure to less than the limits required by the Mine Safety and Health Administration. In the *Draft Environmental Impact Statement for Roca Honda Mine*, assessment of the impacts considered the effect of the worker and public protections that would be available for today's mines that were not implemented in earlier years of mining operations. The EIS identified the impacts from future operations as less than significant, while the cumulative impacts on human health and safety did rise to significant in part due to impacts from past operations

In the HALEU EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological

and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes.

Unrelated to the Proposed Action but related to various concerns about legacy issues, DOE's Office of Legacy Management (https://www.energy.gov/lm/office-legacy-management) was established to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the environment. In addressing its mission, the Office of Legacy Management functions to:

- Protect human health and the environment through effective and efficient long-term surveillance and maintenance.
- Preserve, protect and make accessible legacy records and information.
- Support an effective and efficient workforce structured to accomplish departmental missions.
- Implement departmental policy concerning continuity of worker pension and medical benefits.
- Manage legacy land and assets, emphasizing safety, reuse, and disposition.
- Mitigate community impacts resulting from the cleanup of legacy waste and changing departmental missions.
- Actively act as liaison and coordinates all policy issues with appropriate departmental organizations.

Additionally, government agencies are actively addressing legacy issues within their jurisdiction (https://www.epa.gov/radtown/radioactive-waste-uranium-mining-and-milling#:~:text=The%20solid%20radioactive%20wastes%20that,chemicals%20from%20the%20recovery%20process).

- The **U.S. Environmental Protection Agency (EPA)** relies on several regulations and laws to protect people and the environment from radiation exposure from the uranium extraction process. The Uranium Mill Tailings Radiation Control Act sets limits on radium in soil from mill tailings, which EPA enforces through Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings. The Clean Air Act limits the amount of radon that can be released from tailings impoundments and underground uranium mines. Runoff water from mines, mills, and ore piles is regulated under the Clean Water Act. The Safe Drinking Water Act sets limits for radionuclides in drinking water. Some uranium mining and milling sites are cleaned up under the EPA Superfund program.
- The **U.S. Nuclear Regulatory Commission (NRC)** licenses and oversees the operations of mills, heaps and in situ leaching mines. The NRC rules for tailings impoundments are based on EPA limits. NRC regulations for mining and milling are found in Chapter 1 of Tittle 10 of the Code of Federal Regulations, including 10 C.F.R. §20, 10 C.F.R. §40 and Appendix A to 10 C.F.R. §40. Guidance for licensees and applicants to implement the NRC regulations are found in multiple Regulatory Guides. Facilities must have a radiation safety program to protect workers in order to get an NRC license.
- Many states**,** known as **Agreement States**, have signed formal agreements with the NRC to exercise authority over the licensing and operations at mills and in situ leaching mines. Agreement States inspect facilities to make sure the staff is properly trained and that equipment is operating safely.

- The **U.S. Department of Labor, Mine Safety and Health Administration** enforces safety and health rules at mines and mills. These rules help to reduce health hazards and accidents in the nation's mines and mills.
- The **U.S. Department of the Interior, the Bureau of Land Management** manages millions of acres of land—about one-eighth of the land in the United States. The Bureau manages about 700 million more acres of underground mines, including uranium mines. The Office of Surface Mining provides funds to many state and Tribal agencies for cleaning up uranium mines on their land.
- The **U.S. Army Corps of Engineers** operates the Formerly Utilized Site Remedial Action Program. Its job is to identify and clean up old, contaminated facilities that supported the Federal government in the early years of the nation's atomic energy program. Some of these sites have radioactivity levels above today's regulatory limits. The U.S. Army Corps of Engineers also assists the EPA and Tribes in cleaning up abandoned mines on Tribal lands.

The efforts associated with the Proposed Action are independent of the efforts to address legacy issues. Any action DOE takes to implement the Proposed Action would not impact the efforts DOE or other regulatory bodies are taking to address legacy issues associated with defense and commercial uranium production.

2.5 Radioactive Waste and Spent Nuclear Fuel Management and Disposal

Comments Summary

Commenters expressed concerns about generating radioactive waste, including waste associated with reactor disposition and SNF management. These concerns included the potential for SNF storage at reactor locations or interim storage facilities and the lack of long-term solutions for the management and disposition of SNF. Some commenters expressed legacy waste management concerns and concerns about the DUF_6 byproduct from uranium enrichment.

DOE Response

As discussed in Vol. 1, Section 2.6.1.10, of this EIS, waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. Wastes (i.e., radioactive, mixed-radioactive, and non-radioactive wastes) associated with HALEU production are the same as those associated with LEU production and do not pose unique characteristics.

Waste quantities generated from the production of HALEU would represent small fractions of the commercial facilities' capacities. The HALEU SNF that could be generated from the implementation of the Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF.

As described in Vol. 1, Sections 2.1.7.3 and 3.7.3, HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. At-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible (as further discussed in Section 3.7.3.1). Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF.

The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and Federal consolidated interim storage. In the interim, as previously described, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, *Existing NEPA Documentation*. This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity at the reactor. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF.

Regarding legacy issues, please see the section titled *Legacy Issues*.

Regarding concerns about DUF_6, DOE notes that depleted uranium (DU) is not a waste. It is a resource being stored for future use as needed. The less than 18,000 MT of DUF_6 that may be generated under the Proposed Action is a small fraction of the more than 740,000 MT of existing inventory being managed by the DOE. The DU inventory is required to be maintained consistent with Federal, state, and local requirements.

2.6 Transportation

Comments Summary

Some commenters were concerned about the risk to public health and safety from the transportation of radioactive materials (uranium ore and HALEU products) from mines to various facilities for milling, conversion, and enrichment. Most commenters were especially concerned with the transport of ores, which does not require specific containment for their transport on local and highway routes. Additionally, some commenters raised concerns about potential accidents and impacts during transport.

DOE Response

The transportation of uranium products during the HALEU fuel cycle activities is expected to result in low overall human health risks, as these activities would be conducted in a safe manner based on compliance with Federal and state comprehensive regulatory requirements.

The transportation activities during the HALEU fuel cycle are similar to those that are currently occurring to support existing nuclear power plant operations. The NRC has established the basis for evaluating the contribution of environmental effects, including transportation impacts, of a nuclear fuel cycle and the transportation of fuel and wastes to and from light water reactors (LWRs) in Tables S-3 and S-4 of 10 C.F.R. §51, with a conclusion that these impacts are SMALL. The NRC's conclusions were based on analyses of the environmental effects of the transportation during the fuel cycle in the *Environmental Survey of the Uranium Fuel Cycle*, WASH-1248 (AEC, 1974); transportation of fuel and waste to and from LWRs in the *Environmental Survey of Transportation of Radioactive Materials To and From Nuclear Power Plants*, WASH-1238 (AEC, 1972); and in a supplement to WASH-1238, NUREG-75/038 (NRC, 1975). Impacts are provided for normal conditions of transport and accidents in transport for a reference 1,100 megawatts electric LWR. Table S-3, 10 C.F.R. §51.51, summarizes the environmental impacts of transportation for the fuel cycle to be 2.5 person-roentgen equivalent man (rem) exposure to the workers and public per year. Table S-4, 10 C.F.R. §51.52, summarizes the estimated dose to transportation workers during normal transportation operations to be 4 person-rem and collective dose to the public along the route and the dose to onlookers were estimated to result in 3 person-rem per reactor per year of operation.

Since the publication of WASH-1238 (AEC, 1972), WASH-1248 (AEC, 1974), and NUREG-75/038 (NRC, 1975), additional studies have been performed regarding the risk from the transportation of fuel cycle materials, unirradiated fuel, and SNF. In 1977, the NRC published NUREG-0170, *Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes*, which assessed the adequacy of the regulations in 10 C.F.R. §71, then titled *Packaging and Transportation of Radioactive Waste* – NUREG-0170 (NRC, 1977). In that assessment, the measure of safety was the risk associated with radiation doses to the public under routine and accident transport conditions, and the risk was found to be acceptable.

Notwithstanding the above conclusion, the HALEU EIS includes a detailed transportation analysis of the HALEU fuel cycle activities. The analyses in this EIS show that such risks are SMALL. As discussed in Vol. 1, Section 3.6, and in Vol. 2, Section A.6 in Appendix A of the Final HALEU EIS, the transportation activities would result in a small collective population risk, which is a measure of the total risk posed to society as a whole. Specific details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Table A-8 of Appendix A in the Final HALEU EIS summarizes the transportation risks for each activity within the HALEU fuel cycle.

The human health transportation risk analysis in this HALEU EIS incorporates by reference resource conditions and impact considerations of the existing NEPA documentation prepared by the NRC and DOE, as listed in Section A.6.2.2 of Appendix A of the HALEU EIS. These are standard analyses that have been used consistent with Federal regulations, 10 C.F.R. §51 and 10 C.F.R. §71.

Both radiological and nonradiological transportation impacts are evaluated in this EIS.

The primary radiological transportation risk to the public is from the low level of radiation emanating from the transport vehicle. The magnitude of the collective population risk is primarily determined by the number of routes, the length of each route, the number of shipments along each route, the external dose rate of each shipment, and the population density along a given route. Thus, higher collective population risks are associated with activities that require transportation over longer distances. Only truck transports of radioactive materials (uranium and HALEU products) are considered.

Potential radiological human health impacts from transportation accidents were evaluated. The risks to human health from the radiological nature of the shipments include analyses of various exposure pathways: (1) external exposure to a passing radioactive cloud; (2) external exposure to contaminated ground; (3) internal exposure from inhalation of airborne contaminants; and (4) internal exposure from the ingestion of contaminated food (related to potential releases in rural areas). The analysis of accident risks accounts for a spectrum of accidents ranging from high-probability accidents of low severity (e.g., a "fender bender") to hypothetical high-severity accidents that have a corresponding low probability of occurrence.

Nonradiological impacts are independent of the nature of the cargo being transported and are expressed as traffic accident fatalities resulting only from the physical forces that accidents could impart to humans.

Even though the EIS does not identify specific locations for fuel cycle facilities, the EIS transportation analysis used conservative assumptions about the distances traveled during transportation (considering longest distances between the potential locations/facilities of source and product materials [e.g., mines to conversion, conversions to enrichment, enrichment to fuel fabrication and/or deconversion, and deconversion to storage]). The analysis is expected to bound the population impacts regardless of where the facilities would be located. The analysis considered transportation of all forms of uranium materials: from the mines to the mills, from an in situ recovery or mill to the conversion facility, from the conversion facility to enrichment facilities, from the enrichment facility to a deconversion facility, from the deconversion facility to a storage facility, and from the storage facility to the fuel fabrication facility. For

the transportation analysis, all facilities were conservatively assumed to be independently sited (i.e., no co-location of facilities).

The U.S. Department of Transportation (USDOT) regulates the transportation of hazardous materials in commerce by land, air, and water. USDOT specifically regulates the carriers of radioactive materials and the activities related to transport, such as marking and labeling, routing, handling and storage, and vehicle and driver requirements. The NRC regulates certain aspects of the packaging and transportation of radioactive material for its licensees, including transportation by commercial shippers of radioactive materials. DOE, through its management directives, orders, and contractual agreements, further ensures the protection of public health and safety by imposing a variety of requirements and standards for transportation activities done by or on behalf of DOE incorporating the requirements and standards of USDOT and NRC and establishing that all Departmental shipments achieve an equivalent level of safety to that required by USDOT and NRC. DOE-NE currently has five cooperative agreements with states and Tribes to support engagements on topics related to transportation of SNF. DOE largely engages with states and Tribes through DOE's National Transportation Stakeholders Forum (NTSF), which hosts various meetings, activities, and working groups allowing for state and Tribal input and engagement on transportation related projects and programs.

With regards to the state-level interface, the Senior Executive Transportation Forum was established by the Secretary of Energy in January 1998 to coordinate the efforts of Departmental elements involved in the transportation of radioactive materials and waste. In response to recommendations from various DOE programs and external stakeholders, the Forum agreed to evaluate the shipping practices being used or planned for use throughout the Department, document them, and, where appropriate, standardize them. The results of that effort are reflected in the DOE Manual 460.2-1A, *Radioactive Material Transportation Practices Manual* (DOE, 2008), and later in the revised DOE Order 460.2B (DOE, 2022), replacing the DOE Manual 460.2-1A. This Manual established a set of standard transportation practices for DOE to use in planning and executing offsite shipments of radioactive materials including radioactive waste. These practices establish a standardized process and framework for interacting with state, Tribal, and local authorities and transportation contractors and carriers regarding DOE radioactive material shipments. The Manual was developed in a collaborative effort with the State Regional Groups (Western Governors Association, Southern States Energy Board, Midwest and Northeast Councils of State Governments) and Tribal representatives. The DOE maintains a working relationship with the State Regional Groups to address transportation planning issues as they arise. Use of the State Regional Groups ensures that we address concerns from one region to another when planning routing. It should be noted that for radioactive waste transports, the carrier is responsible for the routing of the shipment in accordance with USDOT 49 C.F.R. §172 requirements. The DOE has also established the Transportation Emergency Preparedness Program (TEPP) to address the concerns and help ensure Federal, state, Tribal, and local responders have access to the plans, training, and technical assistance necessary to safely, efficiently, and effectively respond to radiological transportation accidents. TEPP focuses training and outreach along active or planned DOE transportation corridors and is coordinated with local and state officials in the affected jurisdictions. TEPP actively works with the corridor states and tribes to provide training, planning assistance and exercises. More information on TEPP can be found at www.em.doe.gov/otem.

The analyzed transportation routes in all of the incorporated NEPA analyses were generated using a route selection computer program software, which is a geographic information system-based transportation analysis computer program used to identify the highway routes for transporting radioactive materials within the United States. The features in this software allow users to determine routes for shipment of radioactive materials that conform to USDOT regulations as specified in 49 C.F.R. §397 for “highway route

controlled quantities" of radioactive material. All of the shipment routes evaluated follow the USDOT transport routing regulations for highway route controlled quantities. The objectives of the regulations are to reduce the impacts from transporting radioactive materials, establish consistent and uniform requirements for route selection, and identify the role of state and local governments in routing radioactive materials. The regulations require the carrier of radioactive materials to ensure that (1) the vehicle is operated on routes that minimize radiological risks and (2) accident rates, transit times, population density and activity, time of day, and day of week are considered in determining risk. The routes were selected to be reasonable and consistent with routing regulations and general practice, but they are representative routes only because the actual routes would be chosen in the future.

Transportation packaging for radioactive materials is designed, constructed, and maintained to ensure that the package contains the package contents and provides radiation shielding. The type of packaging used is determined by the total radioactive hazard presented by the material within the packaging. For example, natural uranium ore is classified as a low-specific activity material with no activity limit and no specific packaging requirements, as covered under 49 C.F.R. §173, (Shippers – General Requirements for Shipments and Packaging). Requirements for motor carrier transportation can also be found in 49 C.F.R. §350–399. The ores can be transported unpackaged by haul trucks (10 C.F.R. §173.427 (c)), with cover tarps to minimize dust generation through their transports. The refined uranium ore concentrate (yellowcake product) is packed in 55-gallon containers (or drums) and is classified as type industrial packaging (see 49 C.F.R. §171–189). The packaging needs for the other uranium products are identified and discussed in Attachment A to Section 6 of the Technical Report (Leidos, 2023). In addition, Section 2001 of the Energy Act of 2020 has provisions for the design and certification of packages specifically for the storage and transportation of HALEU.

In the HALEU EIS, the HALEU products (uranium hexafluoride, uranium metals or oxides) were assumed to be transported in currently certified packages such as 30B-20 cylinders for the HALEU hexafluoride in DN30-X protective structural packaging (NRC, 2023b), Optimus-L for HALEU oxides, and ES-3100 for HALEU metal (Leidos, 2023). The NRC recently certified Optimus-L for transporting HALEU in tri-structural isotropic (or TRISO form, which is uranium carbide and application for uranium oxides would be similar.

Table 6-4 of the referenced Technical Report (Leidos, 2023) summarizes the quantitative results of the transportation impacts for the various activities within the HALEU fuel cycle. As shown in this table as well as Table A-7 in Vol. 2 of the HALEU EIS, the impacts of transporting radioactive materials under the Proposed Action are expected to be SMALL. Overall, there would be a maximum of 380 to 415 annual shipments of various uranium products, and over 1 million kilometers (621,371 miles) traveled annually, covering the activities in various steps between the uranium recovery and storage facility for production of 25 MT of HALEU per year. For a 50 MT HALEU production per, there would be on the average less than three truck transports per day, and about 1.3 million miles of transports per year. The results indicate that it is unlikely the transportation activities under the Proposed Action would lead to a latent cancer fatality among the workers or general populations from radiological exposures in these transports.

Table 4.2-1 of the HALEU EIS summarizes cumulative transportation impacts. This table provides the expected total impacts, in terms of total doses received by workers (truck drivers) and the general population, from transportation of various forms of uranium materials for an annual production of 50 MT of HALEU. The population doses include both the exposures from incident-free operation and potential accident conditions during transport. To get a better perspective on the cumulative transportation risk, the analysis in Vol. 1, Section 4.2, included risks from historical shipments, general radioactive materials transportation that was not related to any particular action, and reasonably foreseeable actions. As shown in Table 4.2-1, the transportation impacts from the Proposed Action are expected to be SMALL and would not substantially contribute to cumulative impacts.

With respect to emergency response, in the event of a radiological release from a shipment along a route, trained and equipped local emergency response personnel would be expected to arrive first at the accident scene. It is expected that response actions would be taken in accordance with the guidance in the *National Response Framework* (DHS, 2019) and the related *Nuclear/Radiological Incident Annex* (DHS, 2023). Based on the initial assessment at the scene, training, and available equipment, first responders would involve Federal and state resources, as necessary. First responders and/or Federal and state responders would initiate actions in accordance with the USDOT *Emergency Response Guidebook* (USDOT, 2024) to isolate the incident and perform the actions necessary to protect human health and the environment (such as evacuations or other means to reduce or prevent impacts to the public). Cleanup actions are the responsibility of the carrier. DOE engages with states and Tribes on topics of emergency response and transportation through NTSF meetings, webinars, and ad hoc working groups. One ad hoc working group is focused on evaluating the Department's proposed Section 180(c) policy and helping DOE consider issues of importance to state, Tribal and other government entities to effectively conduct planning and training for emergency response in support of a national SNF shipping program. NTSF members also receive information on the TEPP, an emergency response training program managed by the Office of Environmental Management.

To mitigate the possibility of an accident, DOE issued the DOE Order 460.2B, *Departmental Material Transportation Management* (DOE, 2022). This order specifies requirements for the planning of operational events (contingencies) and for emergency response. Carriers are expected to exercise due caution and care in dispatching shipments and determine the acceptability of weather and road conditions, whether a shipment should be held before departure, and when actions should be taken while en-route. The order emphasizes that shipments should not be dispatched if severe weather or bad road conditions make travel hazardous. Current weather conditions (at the point of origin and along the entire route), and the weather forecast would be considered before dispatching a shipment.

2.7 NEPA Process

Several commenters submitted various comments with questions about the preparation of the HALEU EIS, the mechanisms for getting a response to the public, as well as other agency involvement in this EIS. However, a large number of commenters expressed interests in the following categories:

- Support for comment extensions, and
- Support for faster environmental review timelines.

Given the number of submissions on both topics, two summary responses are included here. Other comments about the NEPA process are addressed individually in this CRD.

Comments Summary

Several commenters requested formal comment extensions on the basis of having inadequate time to complete their analysis of the Proposed Action activities outlined in this EIS and a premature closure of the regulations.gov website as a comment submission mechanism.

DOE Response

Consistent with NEPA requirements regarding public review of EISs (10 C.F.R. §102.313), and informed by DOE's NEPA experience with stakeholders in submitting comments on Federal projects, DOE offered a public review and comment period of 45 days. However, DOE-NE also accommodated comments submitted past the close of the comment period to the extent practicable and additionally began accepting comments with the publication of the DOE NOA on February 29, 2024, more than a week prior to EPA's publication of the NOA. Therefore, DOE did not feel a formal comment period extension was warranted.

DOE also received several requests for extensions which cited the premature closure of the www.regulations.gov website. Regulations.gov is an official website used to increase participation in the government's regulatory activities by offering a central point for submitting comments on regulations. This system compiles all active government projects into one location and accepts comments on behalf of the agencies involved. The close of the comment period was incorrectly listed on regulations.gov as March 8, 2024, instead of April 22, 2024. March 8, 2024, was the day the NOA was published by EPA in the *Federal Register,* 89 Fed. Reg. 16,765 (Mar. 8, 2024).

DOE was notified of this error with only a few days left in the comment period. While DOE understands the inconvenience of this website's premature closure, regulations.gov was not listed as a formal comment submission mechanism for the HALEU EIS. Formal submission methods were listed in the Draft HALEU EIS as the project email (HALEU-EIS@nuclear.energy.gov) or via U.S. mail to Mr. James Lovejoy, HALEU EIS Document Manager, U.S. Department of Energy, Idaho Operations Office, 1955 Fremont Avenue, MS 1235, Idaho Falls, ID 83415. Each of these addresses was included in the Draft HALEU EIS, notification materials, public hearings, and Tribal Listening Sessions. Additionally, regulations.gov included the HALEU NOA on its submission page, which listed the formal comment pathways as well as the correct end date for the public comment period.

A comment extension was not deemed necessary under these circumstances.

Exceptions were made for Tribal members who requested extensions during the Tribal Listening Sessions. These extensions were made on an individual basis, but DOE remained open to further Tribal requests for extensions. These extensions were granted due to technological barriers that may cause accessibility issues with internet-hosted documents, Tribal Listening Sessions being held later in the comment period, and DOE's commitment to understanding Tribal perspectives on Federal actions.

Comments Summary

Several commentors requested DOE strictly adhere to or speed up the project timeline. Of these commenters, some suggested removing duplicative reviews and others suggested preparing an Environmental Assessment or Categorical Exclusions for certain LEU activities, instead of an EIS.

DOE Response

DOE prepared an EIS to comprehensively evaluate the Proposed Action activities. This provides a single, high-level document without segmenting the various activities' evaluations in different documents and in varying levels of detail. This is consistent with the intent and implementing requirements for a NEPA evaluation. Additionally, the NEPA process, including review cycles for the HALEU EIS were planned to be as efficient as possible to ensure informed decision-making in a timely manner and without unnecessary delay.

2.8 Out of Scope

Several commenters submitted comments about other nuclear reactor plants and SNF reprocessing projects, worker compensation programs both for legacy and future activities, as well as congressional decisions initiating the HALEU Availability Program. However, a large number of commenters expressed interests in the following categories:

- Renewable energy technologies as an alternative to the Proposed Action;
- Requests for cost transparency related to the implementation to this program; and
- Requests that risks and costs of this program be taken up by industry, rather than government subsidies.

Given the number of submissions on these topics, three summary responses are included here. Other comments related to out of scope topics are addressed individually in this CRD.

Comments Summary

Many commenters supported renewable energy technologies such as solar and wind as alternatives to the Proposed Action. These commenters cited long construction timelines associated with nuclear reactors, unproven and expensive ANR technologies, and the need for cleaner alternatives to nuclear.

DOE Response

Renewable energy technologies would not be a reasonable alternative for the HALEU EIS as they would not satisfy the purpose and need. One of the aspects of a clean energy future is sustainment and expanded development of safe and affordable nuclear power, and one key element of that goal is the availability of fuel to power advanced reactors. Congress, in Section 2001(a) of the Energy Act of 2020 charged the Secretary of Energy with establishing and carrying out, through DOE-NE, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use 42 U.S.C. §16281(a).

DOE projects that more than 40 MT of HALEU will be needed by 2030 with additional amounts required each year thereafter to deploy a new fleet of advanced reactors in a timeframe that supports the Administration's 2050 net-zero emissions target (DOE, n.d.). DOE also predicts that commercial demand will increase to over 50 MT per year of HALEU by 2035 and over 500 MT of HALEU per year by 2050.

As discussed in Section 1.1, *Purpose and Need*, of this EIS, the Proposed Action is needed to create a supply of HALEU (primarily for energy production). Thus, additional DOE support for alternative energy (electrical production capabilities) such as wind and solar power, would not meet the identified purpose and need. Therefore, renewable energy alternatives were not considered reasonable alternatives for this EIS. Vol. 1, Chapter 2, specifically Section 2.4, further discusses alternatives considered and dismissed from analysis.

It is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller, safer reactors that could be licensed and constructed in less time and at less cost than traditional light water reactors. Because many of these advanced reactor designs would be first of a kind, there is a large level of uncertainty in the time required to design, license, and construct these reactors. The commercial industry is working with the Federal government regulators (primarily the NRC) to overcome these obstacles.

As described in Vol. 1, Section 2.6.2, of this EIS, the full-lifecycle greenhouse gas (GHG) emissions of coal and natural gas-power generation sources are substantially higher than for nuclear power. For instance, coal generates 820 grams (g) of carbon dioxide equivalent (CO_2e) per kilowatt-hour (g CO_2e/kWh) of electricity, while natural gas produces 490 g CO_2e/kWh. Even hydroelectric and solar produce lifecycle emissions at 24 g CO_2e/kWh and 41 g CO_2e/kWh, respectively. In contrast, nuclear power produces 12 g CO_2e/kWh. Therefore, using coal or natural gas (and even hydroelectric and solar) to generate electricity would result in higher GHG emissions.

Also as described in Vol. 1, Section 2.7.1.3, of the HALEU EIS, emissions from the Proposed Action and related activities and could add between 770,000 to 2.45 million MT of CO_2e to global GHG emissions. Offsetting the CO_2e emissions from the Proposed Action and related activities would be the expected reduction of CO_2e emissions if the power produced were from reactors fueled by the up to 290 MT of HALEU instead of power produced by existing electrical power generation sources within regions across the United States. The total electrical power that could be generated by advanced reactors with the use of HALEU fuel produced under the Proposed Action is estimated to be up to 64 gigawatt-years (electricity),

or 569,000,000 megawatt-hours (MW-h). Total CO_2e emitted from the generation of 569,000,000 MW-h could range from 61.7 million MT to a high of 420 million MT, depending upon the mix of current generation capabilities assumed. These estimates reveal that electrical power generated by HALEU-fueled ANRs could result in 94% to greater than 99% lower CO_2e emissions, compared to power generated from the combination of existing sources.

Comment Summary

Many commenters requested transparency about how much funding was allocated toward the HALEU Availability Program. Similarly, several commenters requested to see directly how that money is being used for this Proposed Action. Other commenters requested cost comparisons between funding allocations designated to the Proposed Action compared to reinvestment of those funds into in solar or wind technologies.

DOE Response

The Inflation Reduction Act, Pub. L. 117-169, 136 Stat. 2051, Part 7, Section 50173, provided $700 million in support of various HALEU Availability Program activities directed in the Energy Act of 2020. From this amount, under the Proposed Action, $500 million would be used to enter into contracts for enrichment, deconversion, and storage of HALEU, pursuant to DOE issued Requests for Proposals. The Requests for Proposals are Indefinite Delivery/Indefinite Quantity contracts. Task Orders would be assigned by DOE, after award of the contracts and once work is identified as needed. Each Task Order would describe the type of work to be performed with associated work products or deliverables, the due date(s) of the work products and deliverables, the quality requirements, and any unique requirements for the Task Order. Further, Section 312 of the Consolidated Appropriations Act of 2024 authorized additional funding to carry out the Nuclear Fuel Security Act of 2023 (Section 3131 of the National Defense Authorization Act for Fiscal Year 2024), Pub. L. 118-31, 137 Stat. 795, Subtitle C, codified at 42 U.S.C. §16282(b)(1), which seeks to increase domestic production of HALEU to meet the needs of advanced nuclear reactor developers and the consortium established under Section 2001(a) of the Energy Act of 2020.

These funds were allocated for HALEU, and therefore, could not be used to reinvest into renewable energy technologies. A cost comparison of the allocated HALEU funds being used for HALEU versus funds being used for reinvestment in solar and wind technologies is outside the scope of this EIS.

It should be noted that the Inflation Reduction Act made significant investments in climate and energy initiatives. These investments also fund other programs within DOE and other Federal agencies to stimulate renewable energy technologies (including wind and solar). Such funding allocations range in billions of dollars of investments compared to HALEU's $700 million in investments.

Comment Summary

Several commenters expressed the view that the risks and costs of the Proposed Action should fall on industry instead of relying on government subsidies or taxpayer dollars.

DOE Response

Congress passed, and the President signed, legislation into law directing the Secretary to establish and carry out a program to support the availability of HALEU and appropriated funding for this activity. The Proposed Action addresses the proposed implementation of that legislation. The Energy Act of 2020 directs the DOE to "establish and carry out . . . a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use" 42 U.S.C. §16281(a)(1); (2)(H). In response to the RFI, many responses from industry indicated a potential timing/coordination issue with developing domestic commercial HALEU enrichment capability. Those interested in designing, building,

and operating advanced reactor designs that use HALEU fuel were hesitant to invest in the technology without a firm source of HALEU fuel. Likewise, those interested in providing HALEU fuel were hesitant to invest in facilities without a firm demand. As described in multiple responses to the RFI, this is a "chicken-and-egg" dilemma.

To address this issue, an initial public/private partnership, in the form of the Proposed Action, was proposed to accelerate development of a sustainable commercial HALEU supply capability. If successful, this partnership could provide the incentive for the private sector to incrementally expand the capacity in a modular fashion as a sustainable market develops. Until that time, initial subsidies are needed to help stimulate these industries per the direction of the Energy Act of 2020.

SECTION 3
PUBLIC COMMENTS AND DOE RESPONSES

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3.0 Public Comments and DOE Responses

This section presents a side-by-side display of the comments received by DOE during the public comment period on the Draft HALEU EIS and DOE's response to each comment. To find a specific commenter or comment in the following pages, refer to the "List of Commenters" immediately following the Table of Contents. This list is organized alphabetically by commenter name and shows the corresponding page number(s) where commenters can find their comment(s).

If commenters provided written comment documents that are essentially the same, these comment documents may be treated as a campaign. Commenters who submitted documents as part of a campaign are referred to a copy of the initial campaign comment document DOE received (e.g., Comment ID 132). This section only contains one representative copy of each campaign.

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Commenter No. 1: John Sullivan

From: johnsullivan
To: HALEU-EIS
Subject: [EXTERNAL] Comment on EIS
Date: Saturday, March 2, 2024 8:54:11 AM

It is imperative that the EIS take into account the not only the deaths that will occur due to uranium mining, but also the environmental impact of the end product of nuclear fission, i.e. highly radioactive material that must be kept out of the general environment for over 100,000 years. Nuclear fission is a dead end technology due to the fact that there is no rational solution to the problem of nuclear waste. There is a reason that there is no permanent national nuclear waste disposal site. It is simply that no population is the US wishes to have this material stored near them nor near anything that they might use, such as an underground aquafer. I call on the Department of Energy and the EPA to reject any further nuclear mining or development of nuclear fuel.
Sent from Mail for Windows

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001-1

001-2

001-3

001-1 The HALEU EIS does address, in Chapter 3 and Appendix A, the potential health impacts of all activities associated with the HALEU fuel cycle activities needed to support the Proposed Action. These include the impacts associated with mining and milling, conversion, enrichment to HALEU levels, deconversion, storage, and transportation. The assessments of potential health impacts are based on multiple NEPA documents and documented in a Leidos Technical Report (Leidos, 2023).

001-2 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, HALEU Spent Nuclear Fuel Storage and Disposition, HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute

Commenter No. 1 (cont'd): John Sullivan

to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, Environmental Consequences Supporting Information. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

001-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. This EIS only evaluates HALEU, other fuels for nuclear power (e.g., LEU fuel, thorium fuel, etc.) are outside the scope of the HALEU EIS. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 2: James Sprinkle

From: James Sprinkle
To: HALEU-EIS
Subject: [EXTERNAL] Support Haleu production
Date: Thursday, February 29, 2024 5:22:54 PM

The US should proceed expeditiously with HALEU production domestically. ▮ ***002-1***
James Sprinkle
LANL (retired)

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002-1 DOE acknowledges your support for the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 3: Gail Tackett, Nevada Department of Environmental Protection

From: Gail Tackett
To: HALEU-EIS
Subject: [EXTERNAL] NEWS: DOE Issues Draft EIS on Proposed HALEU Activities
Date: Thursday, February 29, 2024 6:22:22 PM
Attachments: image001.gif
image002.png
image003.png
image004.png
image005.png
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Dear Mr. Lovejoy. The Bureau of Federal Facilities is respectfully requesting a Hard Copy of this report. Is this something we can do? If so, please send to:
NDEP / BFF
375 E Warm Springs Rd.
Suite 200
Las Vegas, NV 89119
Please contact me at 702-668-3904 if you require further information or if we need to make other arrangements.
Thank you!

Gail Tackett
Administrative Assistant III
Bureau of Federal Facilities
Nevada Division of Environmental Protection
Department of Conservation and Natural Resources
375 E. Warm Springs Road, Suite 200
Las Vegas, NV 89119
gtackett@ndep.nv.gov
(O) 702-668-3904 | (F) 702-486-2863

From: Office of Nuclear Energy <NECommunications@public.govdelivery.com>
Sent: Thursday, February 29, 2024 8:08 AM
To: Justin Costa Rica <jcostarica@ndep.nv.gov>
Subject: NEWS: DOE Issues Draft EIS on Proposed HALEU Activities

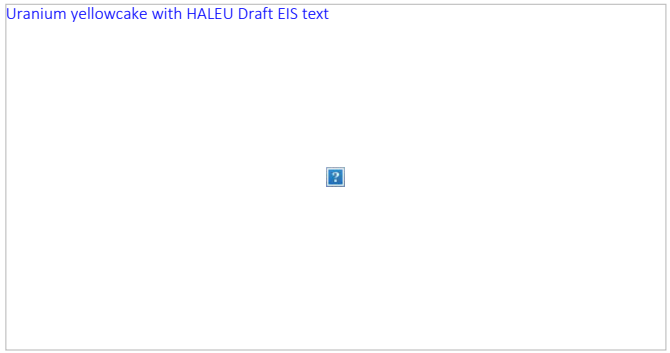
003-1

003-1 This is not a comment. It is a request for a hard copy, which was provided.

Commenter No. 3 (cont'd): Gail Tackett, Nevada Department of Environmental Protection

February 29, 2024

DOE Issues Draft Environmental Impact Statement Advancing Biden-Harris Administration's Goal to Boost Domestic HALEU Production



DOE Seeks Public Feedback on HALEU Activities

WASHINGTON, D.C. – The U.S. Department of Energy (DOE) today released a draft Environmental Impact Statement (EIS) analyzing potential impacts of the Department's proposed action to acquire high-assay low-enriched uranium (HALEU). The Biden-Harris Administration is committed to securing a domestic supply of HALEU, a key material needed for most U.S. advanced reactors to achieve smaller designs, longer operating cycles, and increased efficiencies over current nuclear energy technologies. HALEU is not currently available from domestic suppliers, which could significantly impact the deployment of advanced reactors.

DOE is seeking public comment on the draft EIS, which evaluates the impacts of DOE's plans to acquire HALEU for use in commercial nuclear energy production or demonstration projects, as well as establish commercial production of HALEU in the United States.

"Establishing a secure, domestic HALEU supply is an important step in demonstrating and commercializing advanced nuclear reactors, which are key to meeting the Biden-Harris Administration's clean energy goals by 2035," **said U.S. Assistant Secretary for Nuclear Energy Dr. Kathryn Huff**. "Public feedback on the draft EIS will strengthen the process and help ensure we're considering all the environmental effects of commercial HALEU production."

The Energy Act of 2020 directs DOE to establish and carry out a program to support the availability of HALEU for civilian, domestic research, development, demonstration, and

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Commenter No. 3 (cont'd): Gail Tackett, Nevada Department of Environmental Protection

commercial use. Consistent with this direction, the proposed action of this draft EIS focuses on the acquisition of HALEU produced by commercial entities using enrichment technology and making it available for commercial use or demonstration projects.

DOE will host three virtual public hearings to share information on the process used to analyze the proposed action and alternatives, gather oral comments and feedback on the draft EIS, and enhance opportunities for public participation. The public hearings will be held on April 3, 2024.

DOE invites all interested parties to comment on the draft EIS now through April 22, 2024. Written comments received through the mail must be postmarked by April 22, 2024, to ensure consideration.

Written comments can be submitted by mail and email to the following addresses:

Mail:

Mr. James Lovejoy

DOE EIS Document Manager

U.S. Department of Energy,

Idaho Operations Office,

1955 Fremont Avenue, MS 1235,

Idaho Falls, Idaho 83415

E-mail: HALEU-EIS@nuclear.energy.gov

The comments received will help DOE refine its analysis, identify new information, and consider additional alternatives in preparation of the final EIS. Responses to comments and any associated revisions will be included in the final EIS.

For more information on the draft EIS and to register for the virtual public hearings, visit HERE.

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Media Inquiries: (202)-586-4940 | DOENews@hq.doe.gov

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Commenter No. 3 (cont'd): Gail Tackett, Nevada Department of Environmental Protection

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Commenter No. 4: John Kutsch
Thorium Energy Alliance

From: John Kutsch
To: HALEU-EIS
Subject: [EXTERNAL] JHK - When did the HALEU E.I.S. process start
Date: Thursday, February 29, 2024 1:38:55 PM

Dear HALEU at DoE

when did the HALEU environmental impact statement process start? ***004-1***

was it done all internally or were contractors engaged?

John Kutsch
Executive Director
Thorium Energy Alliance .com
1-312-303-5019

004-1 On June 5, 2023, the DOE Office of Nuclear Energy (DOE-NE) published a Notice of Intent (NOI) to prepare an EIS for DOE activities in support of commercial production of HALEU (88 Fed. Reg. 36573) (see Volume 2, Appendix C, *Federal Register Notices*). DOE produced the HALEU EIS with Leidos and Potomac Hudson Engineering as subcontractors which is further discussed in Chapter 8, "List of Preparers," of Volume 1 of the HALEU EIS.

Commenter No. 5: Diana Cahall

-----Original Message-----
From: Diana Cahall [redacted]
Sent: Friday, March 1, 2024 1:12 PM
To: Lawson, Miranda (CONTR) <miranda.lawson@nuclear.energy.gov>
Subject: [EXTERNAL] Request for draft EIS HALEU

Dear Miranda,
Thank you for your prompt response. I would actually prefer a hard copy of the EIS, if that is possible.
My mailing address is:
Diana Cahall
[redacted]
If you are only able to provide an email copy that is acceptable.
Sincerely,
Diana Cahall
Sent from my iPad

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005-1

005-1 This is not a comment. It is a request for a hard copy, which was provided.

Commenter No. 6: Lonna Richmond

From: Lonna Richmond
To: HALEU-EIS
Subject: [EXTERNAL] HALEU
Date: Saturday, March 9, 2024 1:23:07 PM

hello people,

my two cents is that we have no business making nuclear anything until we have a clear plan for the spent fuel. it is almost synonymous with our plastic pollution - it continues to be made even though its discarded remains are causing a huge problem for our planet and our wildlife. there must be some accountability for these products when all stages of their lives are NOT considered. ***006-1***

sincerely,
lonna richmond

--

006-1 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, Environmental Consequences Supporting Information. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 7: Dwight Rousu

From: Dwight Rousu
To: HALEU-EIS
Subject: [EXTERNAL] waste
Date: Saturday, March 9, 2024 2:02:20 AM

Until there is a permanent storage site for nuclear fuel, no more nuclear fuel should be mined nor processed.

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007-1

007-1 DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 8: Bernadette Ann Brierty, Morongo Band of Mission Indians

TRIBAL HISTORIC PRESERVATION OFFICE

VIA ELECTRONIC MAIL

HALEU-EIS@nuclear.energy.gov

March 23, 2024

Charles Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415

MORONGO BAND OF MISSION INDIANS
A SOVEREIGN NATION

Re: Section 106 Government-to-Government Consultation U.S. Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium

Dear Mr. Lovejoy:

The Morongo Band of Mission Indians ("MBMI" or the "Tribe") Tribal Historic Preservation Office (THPO) received on March 19, 2024,the U.S. Department of Energy (DOE) letter regarding the availability of the Draft EIS for allowing commercial activities in the provisioning of nuclear fuel (uranium). The proposed activity (Project) and the review process required by *Section 106 of the National Historic Preservation Act of 1966 (NHPA), and its implementing regulations at* 36 C.F.R. Part 800, is of interest to the MBMI. This letter serves as notice of the Tribe's intent to participate in *meaningful* government-to-government consultation with the DOE.

Within your letter, there is no indication of the locations where the activities indicated might take place. MBMI is highly committed to the protection of the ancestral territory and traditional use area of the Cahuilla and Serrano people of the MBMI but is also concerned with the natural and cultural environments throughout the USA.

This letter is a request to initiate Section 106 government-to-government consultation regarding the *Draft Environmental Impact Statement (EIS) for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)*. Please provide MBMI with a hard copy of the EIS for study and review. Thank you.

This letter does not conclude consultation. Upon receipt of the requested documents, the MBMI THPO may further provide comments, recommendations, and/or mitigation measures.

The lead contact for this Project is Bernadette Ann Brierty, Tribal Historic Preservation Officer (THPO). Dr. Joan Schneider, Tribal Archaeologist, will be assisting the Tribe in the review of this project. Please do not hesitate to contact us at ABrierty@morongo-nsn.gov, THPO@morongo-nsn.gov, or [redacted], should you have any questions. The Tribe looks forward to meaningful government-to-government consultation with the DOE.

12700 Pumarra Road – Banning, CA 92220 – (951) 755-5259 – Fax (951) 572-6004 – THPO@morongo-nsn.gov

008-1

008-2

008-1 (cont'd)

008-1 While DOE understands and shares Tribal interests in preserving historic and cultural resources and supports the Section 106 consultation process, DOE is not considering site-specific facility or activity locations in this EIS. Therefore, the activities described in the HALEU EIS are not ripe for meaningful Section 106 consultation. DOE expects that other Federal agencies will be involved in the authorization of the HALEU activities and will have obligations to comply with applicable environmental and Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies. Regardless of this limitation, DOE continued to encourage Tribal participation and remains available for government-to-government consultations consistent with its trust responsibilities. Additional information on consultation has been added to Section 6.1 of the EIS.

A hard copy of the Draft EIS was delivered to the Morongo Band of Mission Indians on April 3, 2024, and confirmation of receipt was received on April 29, 2024.

008-2 The HALEU EIS is not intended to support site selection for the activities under and related to the Proposed Action. Those decisions are expected to be the subject of additional environmental analysis prepared by the cognizant regulatory (Federal or state) licensing authority. See also the response to Comment 008-1.

Commenter No. 8 (cont'd): Bernadette Ann Brierty, Morongo Band of Mission Indians

Respectfully,

Bernadette Ann Brierty

Bernadette Ann Brierty

Tribal Historic Preservation Officer

Morongo Band of Mission Indians

CC: Morongo THPO

Response side of this page intentionally left blank.

Commenter No. 9: Tom Clements, Savannah River Site Watch

From: Clements, Tom <Alert>
To: HALEU-EIS
Subject: [EXTERNAL] Comment on Draft EIS on HALEU production
Date: Monday, April 1, 2024 6:23:18 PM
Attachments: draft HALEU EIS comments by SRS Watch April 1 2024.pdf

Attached is a comment on DOE's *Draft Environmental Impact Statement for High-Assay Low-Enriched Uranium (HALEU) Availability Program Activities in Support of Commercial Production of HALEU Fuel*.

Thank you for confirming receipt of the attachment.

Sincerely,

Tom Clements
Savannah River Site Watch
1112 Florence Street
Columbia, SC 29201
https://srswatch.org/

Response side of this page intentionally left blank.

Commenter No. 9 (cont'd): Tom Clements, Savannah River Site Watch

SRS WATCH
Savannah River Site Watch

April 1, 2023

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
HALEU-EIS@nuclear.energy.gov

Comment on *Draft Environmental Impact Statement for High-Assay Low-Enriched Uranium (HALEU) Availability Program Activities in Support of Commercial Production of HALEU Fuel* – posted at: https://www.energy.gov/ne/haleu-environmental-impact-statement

To Whom it Concerns:

I hereby send in these comments on the draft EIS on HALEU production and availability. I submit these comments on behalf of the public-interest group Savannah River Site Watch (SRS Watch), based in Columbia, South Carolina, and request that be made part of the EIS record and also be made publicly available.

Volume 1 of the draft EIS in section 3.9 "Nonproliferation and Terrorism Concerns," states:

"DOE acknowledges that the widescale deployment of HALEU fuels in U.S. reactors, which could be facilitated by the Proposed Action, does present different proliferation concerns than the use of LEU, but believes that (1) adequate controls are in place to reduce the proliferation concerns to acceptable levels and that (2) the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks."

While getting HEU out of commerce is a positive step the question at hand concerns proliferation and security risks of HALEU.

The draft EIS goes on to point out proliferation and security concerns related to HALEU and says "DOE expects that any new assessment would affirm the conclusion that the merits of the use of HALEU outweigh the nonproliferation risks involved."

Likewise, the draft EIS confirms a Nonproliferation Impact Assessment (NPIA) was requested in the scoping comments as part of the EIS process but then does not affirm that a NPIA will be

009-1

009-1 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to

Commenter No. 9 (cont'd): Tom Clements, Savannah River Site Watch

prepared and does not explain why it won't be prepared. No conclusion can be made concerning a proliferation "assessment" about HALEU if no such document exists. How can DOE conclude that "merits of the use of HALEU outweigh the nonproliferation risks involved" if there is no DOE analysis of those risks?

I reiterate that as part of the EIS process and for the record that DOE must prepare a Nonproliferation Impact Assessment on the "proposed action" and on any alternatives to it. I below repeat some of the things I submitted in my scoping comments.

In order to assess the potential proliferation impacts of production and use of uranium fuel enriched to the 20% level, just below the amount of enrichment defined as being HEU (bomb-grade uranium), a NPIA must be prepared. This would assess not only the ability of the enrichment process to exceed the 20% level but also the usability of HALEU, enriched to 20% and lower, to be used in some form of nuclear explosive device.

Such a NPIA would be used by DOE, other agencies and the public to assess and potential proliferation impacts of the technology reviewed in the "proposed action." Such a NPIA would be integral to supporting U.S. non-proliferation policies aimed at halting the spread of nuclear weapons materials and technologies. Absent a NPIA, DOE will not be able to demonstrate that HALEU use is acceptable from a proliferation viewpoint.

As an example of what must be done in this case, DOE has many times in the past conducted, as part of environmental analyses, NPIAs on programs that hold potential proliferation impacts, including:

Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel. USDOE. July 1999.

Nonproliferation Impacts Assessment for the Management of Savannah River Site Spent Nuclear Fuel. DOE/NN-99001919. USDOE. December 1998.

Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives. DOE/NN-0007. USDOE. January 1997.

Draft Nonproliferation Impact Assessment: Companion to the Global Nuclear Energy Partnership Programmatic Environmental Impact Statement, 2008.

If no NPIA is to be prepared as part of the EIS process please explain why not. Further, if no NPIA is to be prepared, please explain how decisions can be made that conform with U.S. nuclear non-proliferation policies without the information that such an essential analysis would provide.

I repeat, a NPIA must be prepared as part of the EIS process.

009-1 (cont'd)

the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 9 (cont'd): Tom Clements, Savannah River Site Watch

And, as part of the NPIA, or in some separate analysis, it must be reviewed if any new HALEU production facility would be utilized to process unobligated uranium into fuel to use in TVA reactors that produce tritium for use in U.S. nuclear weapons. NE should work with other offices in DOE as well as the Government Accountability Office to assess the goal of production of unobligated uranium to be used as TVA fuel.

009-2

Additionally, the EIS must explain details about processing of off-spec or surplus HEU into HALEU. The draft EIS (starting on page 1-6) says this DOE HALEU production is being done, which would be for commercial use:

> The potential near-term supply of HALEU will be from processing DOE materials at DOE facilities. These activities are estimated to produce HALEU as follows:
> • Up to 10 MT of HALEU14 produced from Experimental Breeder Reactor-II fuel at the Idaho National Laboratory (INL)
> • Approximately to 2.5 MT of HALEU produced from existing HEU uranyl nitrate solution in storage at H-Canyon at the Savannah River Site
> • Up to 2.4 MT of HALEU produced by BWX Technologies (BWXT)15 using HEU from Y-12 National Security Complex
> These DOE capabilities could supply up to a total of 14.9 MT of HALEU.
>
> These DOE capabilities could supply up to a total of 14.9 MT of HALEU. There may be other DOE inventories that could provide some additional HALEU for advanced reactor developers, but this would not stimulate commercial development of a domestic HALEU production capability nor meet all near-term HALEU needs; therefore, it is not analyzed in this EIS.

009-3

DOE affirms that this HALEU production would be for commercial purposes. As that is the very subject of the EIS, such HALEU production should be analyzed in depth in it. That analysis would both environmental impacts, worker exposure impacts and proliferation impacts. Such HALEU production, and the associated management of the HEU to be downblended, should also be covered in the requested NPIA.

These comments are submitted by:

Tom Clements
Director, Savannah River Site Watch
1112 Florence Street
Columbia, SC 29201

009-2 The production of unobligated uranium for defense purposes is outside the scope of the HALEU EIS. The purpose and need for the HALEU commercialization effort, as described in Section 1.1, "Purpose and Need," of Volume 1 of the Final EIS, describes DOE's responsibility to fulfill requirements set by the Energy Act of 2020. This act directs DOE "establish and carry out … a program to support the availability of HA-LEU for civilian domestic research, development, demonstration, and commercial use." HALEU produced by the Office of Nuclear Energy would primarily be used for energy production, and otherwise used for research purposes and demonstration capabilities, not defense-related capabilities.

009-3 Downblending of HEU is not part of the Proposed Action. As discussed in Section 2.4 of the HALEU EIS, including downblending of existing stockpiles of HEU in DOE's possession was an alternative considered but dismissed from detailed analysis. Since no alternative considers downblending HEU, the impacts of that action is not addressed in this EIS. Also, since the HALEU EIS does not analyze specific sites as locations for any fuel cycle activity, the limited cumulative analysis performed could not address impacts that were associated with site specific activities including the impacts of downblending at DOE facilities.

Commenter No. 10: Delores Stachura

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] HALEU EIS
Date: Tuesday, April 2, 2024 9:25:35 AM

I strongly oppose any and all development of nuclear energy in the US and elsewhere. -- Delores Stachura

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010-1

010-1 This EIS only evaluates HALEU. Other fuel for nuclear power (e.g., LEU fuel, thorium fuel) are outside the scope of the HALEU EIS. DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 11: Anne Kiley

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] COMMENT on Department's proposal to acquire HALEU for commercial nuclear energy use
Date: Friday, March 8, 2024 12:42:08 PM

No kind of nuclear energy is safe. In this time of geological upset due to the rapidly warming planet, to even consider nuclear energy is any capacity is lunacy. Never mind the fact that there is no safe and secure way to "get rid" of spent nuclear fuel. *011-1* *011-2* *011-3*

Do you want to be responsible for approving this proposal and condemning the people of this country to exposure to a nuclear accident? *011-1 (cont'd)*

We do not need nuclear energy. We need renewable solar and wind. Period. *011-2 (cont'd)*

Anne Kiley
[redacted]

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011-1 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not a sufficient domestic supply of HALEU for these reactors. The HALEU EIS evaluates the impacts, including accident impacts, from nuclear fuel cycle facilities that would be required for HALEU fuel commercialization and from reasonably foreseeable activities related to using HALEU. The comprehensive evaluation of impacts allows DOE to make informed decisions related to the proposed action. Furthermore, the U.S. nuclear industry continues to be recognized as one of the safest industrial working environments in the nation. Many requirements exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. As part of the licensing process for nuclear facilities, a comprehensive set of accident sequences and the likelihood and consequences of these accidents would be analyzed to assure safety of the public and workers. Advanced nuclear reactors would be designed to include features that make the reactors passively safe and prevent or mitigate the consequences of accidents considered by the reactor designers.

011-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Renewable energy technologies would not fulfill the purpose and need of the Proposed Action and fall outside the scope of this EIS. Please reference Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," for additional information.

011-3 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition

Commenter No. 11 (cont'd): Anne Kiley

are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 12: Ginny Schneider

From: Ginny Schneider
To: HALEU-EIS
Subject: [EXTERNAL] Public Comment on Acquiring high-assay low-enriched uranium (HALEU) for commercial nuclear energy use
Date: Friday, March 8, 2024 1:11:30 PM

Dear Mr. Lovejoy,

Due to the long-term toxicity of uranium and nuclear waste, I oppose any acquisition of uranium. As you likely, know many people in New Mexico have been adversely affected by uranium. In fact, here on Cochiti Pueblo we risk contamination if a uranium mine floods here and spreads the toxin across the land here. ***012-1*** ***012-2***

Please do not proceed with this project. ***012-3***

Sincerely,

Ginny Schneider
[redacted]

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012-1 DOE acknowledges your opposition to any acquisition of uranium. To your comment relative to the long-term toxicity of uranium and nuclear waste, the HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Sections 2.1, "Support and Opposition," and 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a further discussion of these topics and DOE's responses.

Commenter No. 12 (cont'd): Ginny Schneider

012-2 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes.(Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD.

012-3 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 13: Anne Kiley

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] HALEU EIS--We don"t need it.
Date: Tuesday, April 2, 2024 1:40:13 PM

Building any further nuclear power plants of any description is nothing less than insane. In this time of climate chaos causing geological disturbances, a nuclear accident is becoming more and more possible every day. Never mind the fact that there is no good and safe way to dispose of spent nuclear fuel. ***013-1*** ***013-2*** ***013-3***

Wake up and stop any further nuclear power infrastructure. We have vast sources of renewable energy. We do not need nuclear power. ***013-4***

Anne Kiley
[redacted]

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013-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. However, DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," and Section 2.2 "Purpose and Need," of this CRD for additional information.

013-2 As stated in the EIS, one aspect of a clean energy future is sustainment and expanded development of safe and affordable nuclear power. The Proposed Action is a component of this initiative. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change (see EIS Section 4.3.2, "Greenhouse Gases and Climate Change," and Section A.8, "Greenhous Gas Emissions Calculations"). Potential impacts from transportation accidents and accidents at nuclear fuel cycle facilities associated with the Proposed Action are considered in Volume 2 of the EIS and in the Leidos technical report (Leidos, 2023). If the Proposed Action is adopted, DOE expects that site-specific accident analysis, including impacts related to climate change and opportunities for resiliency, would be evaluated by the regulatory agencies responsible for permitting and/or licensing the nuclear facilities and transportation activities. The likelihood of accidents associated with geological disturbances such as earthquakes would be considered.

013-3 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3,

Commenter No. 13 (cont'd): Anne Kiley

"HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

013-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. This EIS only evaluates HALEU. Other nuclear power infrastructure (e.g., LEU fueled reactors, thorium fueled reactors, etc.) are outside the scope of the HALEU EIS. Additionally, renewable energy technologies are outside the scope of

Commenter No. 13 (cont'd): Anne Kiley

this EIS. Please refer to Section 2.2, "Purpose and Need," and Section 2.8, "Out of Scope," of this CRD for further discussions on renewable energy technologies and how they do not fulfill the purpose and need. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 14: Ginny Schneider

From: Ginny Schneider
To: HALEU-EIS
Subject: [EXTERNAL] Submitte in Response to public hearings for the Draft HALEU EIS
Date: Tuesday, April 2, 2024 11:37:17 AM

Dear Mr. Lovejoy,

Please ban the use of uranium of any kind. ***014-1***

Sincerely,

Ginny Schneider

US military policy is like playing whack a mole at a cost of a trillion $s a year, death, maiming and environmental destruction. -- Ginny Schneider, 3/26/24

014-1 This EIS only evaluates HALEU, other fuels for nuclear power (e.g., LEU fuel, thorium fuel, etc.) are outside the scope of the HALEU EIS. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," and Section 2.2, "Purpose and Need," of this CRD for additional information.

Commenter No. 15: Lonna Richmond

From: Lonna Richmond
To: HALEU-EIS
Subject: [EXTERNAL] HALEU
Date: Tuesday, April 2, 2024 11:33:30 AM

hello -

i don't know much about this, but i imagine that using HALEU and creating energy through its use, you will still be left with waste that is
radioactive and dangerous. i just read that the US and UK are considering sending nuclear waste to australia. i am sorry, but i do not
support any expansion of nuclear energy until the waste can be dealt with. ***015-1***

sending our waste (like plastic) to another country is unfair and wrong. until the waste can be eliminated or converted to non-radioactive and
safely stored, it is not a viable alternate energy. and besides the fact that it is not sustainable either.

thank you,
lonna richmond

--

015-1 DOE acknowledges your opposition to support any expansion of nuclear energy. Additionally, the Proposed Action does not include sending nuclear waste to other countries. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, Existing NEPA Documentation. This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Sections 2.1, "Support and Opposition," and 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a further discussion of these topics and DOE's responses.

Commenter No. 16: Martin Melkonian

From: Martin Melkonian
To: HALEU-EIS
Cc: Martin Melkonian
Subject: [EXTERNAL] HALEU
Date: Tuesday, April 2, 2024 9:40:19 AM

Dear Sirs:

It is my understanding to unleash HALEU will prolong the life of a technology that is costly and dangerous to humanity.It is time to seek alternatives to our energy needs, including the softer power of wind,solar,geothermal ect.and most important, the reduction of energy demand to meet our most essential needs.

Martin Melkonian
Adjunct Associate Professor,Economics
Hofstra University

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016-1

016-2

016-1 DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," and Section 2.2, "Purpose and Need," of this CRD for additional information.

016-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Renewable energy technology like wind, solar, and geothermal are outside the scope of the HALEU EIS. Please see the discussion in Section 2.2, "Purpose and Need," and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 17: Peter Crownfield

From: Peter
To: HALEU-EIS
Cc: Lawson, Miranda (CONTR)
Subject: [EXTERNAL] HALEU
Date: Tuesday, April 2, 2024 10:02:11 AM

The serious health & environmental impacts of uranium mining, processing, and use are rarely discussed. ***017-1***

The last thing the world needs is more enriched uranium or other radioactive material. All existing nuclear reactors should be decommissioned as rapidly as possible, and no new reactors should be permitted. ***017-2***

The tax dollars spent on subsidizing, via research and assumption of liability, could be much better spent on developing low-impact sustainable energy and incentivizing its rapid development — not to mention funding for universal healthcare & education! ***017-3***

Peter

Peter Crownfield
[redacted]

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017-1 The Technical Report (Leidos, 2023) prepared by DOE in support of the EIS contains a detailed analysis of the potential health and environmental impacts associated with ISR mining and conventional mining and milling and processing. Please refer to Chapter 1 of this Technical Report for further information specific to mining and milling, Chapter 2 for Uranium Conversion, and Chapter 3 for Uranium Enrichment. The Final EIS has been updated to include specific hot links to the appropriate section of the 500+-page Technical Report (Leidos, 2023) to provide more detailed analyses of the basis for the conclusions. Please see also Section 2.4, "Legacy Issues," of this CRD for additional information.

017-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.2, "Purpose and Need," and Section 2.1, "Support and Opposition," of this CRD for additional information.

017-3 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. DOE acknowledges your opposition to nuclear energy and the Proposed Action. Please see the discussion in Section 2.2, "Purpose and Need," and Section 2.1, "Support and Opposition," of this CRD for additional information. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. Using funding allocated for the Proposed Action for universal healthcare or education would not meet the purpose and need and is outside the scope of this EIS. The scope of the Proposed Action is described in Section 1.5 of the Final EIS.

Commenter No. 18: Patricia Carter

From: Pat Carter
To: HALEU-EIS
Subject: [EXTERNAL] Fwd: Reminder: DOE to Host Public Hearings on the Draft HALEU EIS Tomorrow (4/3)
Date: Wednesday, April 3, 2024 8:34:13 AM

TO: James Lovejoy

FROM: Patricia Carter

First: I received the notice of meeting YESTERDAY, Tuesday, April 2. One day isn't actually notification, since the meeting is today, Wednesday, April 3. I suggest you set up a calendar for notifications. ***018-1***

Secondly, although you are in the business of promoting nuclear, and there isn't any hope of being heard, I would like to, as a citizen, object to the acquisition of the so-called HALEU. As a victim of TMI, I know far more about the subject than I would like. There is no SAFE nuclear anything and terminology like "low-level" and "small" reactors would be amusing were it not so dangerous. ***018-2*** ***018-3***

Please pass this objection along to the proper channels, and/or inform me where this objection should be filed. ***018-4***

Patricia Carter
[redacted]

---------- Forwarded message ---------
From: **Lawson, Miranda (CONTR)** <miranda.lawson@nuclear.energy.gov>
Date: Tue, Apr 2, 2024 at 9:09 AM
Subject: Reminder: DOE to Host Public Hearings on the Draft HALEU EIS Tomorrow (4/3)
To: HALEU-EIS <haleu-eis@nuclear.energy.gov>

This email serves as a reminder that public hearings for the Draft HALEU EIS are tomorrow, Wednesday, April 3, 2024.

Sent on behalf of Mr. James Lovejoy.

In accordance with the National Environmental Policy Act (NEPA), the U.S. Department of Energy (DOE) released a draft Environmental Impact Statement (EIS) to analyze the impacts of the Department's proposed action to acquire high-assay low-enriched uranium (HALEU) for commercial nuclear energy use or demonstration projects and to facilitate the domestic commercialization of HALEU fuel production. The draft EIS evaluates potential environmental impacts of DOE's proposed action on various environmental and community resources.
HALEU is a crucial material required by most U.S. advanced reactors to achieve smaller designs,

018-1 The notice referred to in the comment was one of two rounds of email notifications regarding the public hearings. The first was sent shortly after the publication of Notice of Availability for the Draft EIS on March 8, 2024, the second was sent April 2, 2024, as a reminder for the upcoming hearings. Based on our records, your email address was included on both email notifications.

018-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.2, "Purpose and Need," and Section 2.1, "Support and Opposition," of this CRD for additional information.

018-3 Hazards for HALEU production, storage, use, and transport as well as advanced reactors would be further evaluated by the regulatory agencies responsible for the permitting and/or licensing of fuel cycle facilities associated with the Proposed Action in the HALEU EIS. With regard to nuclear reactors, the HALEU EIS addresses, as a reasonably foreseeable activity, impacts related to advanced nuclear reactor operations using HALEU but does not consider specific advanced nuclear reactor designs or spent nuclear fuel storage operations. To develop representative impacts for the reasonably foreseeable action of operating advanced nuclear reactors, the HALEU EIS considers information from the advanced nuclear reactor generic EIS and the site parameter envelope and plant parameter envelope that would be reviewed when licensing advanced nuclear reactors. Reactor-specific analyses would be performed by the cognizant permitting or licensing agency.

018-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.2, "Purpose and Need," and Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 18 (cont'd): Patricia Carter

longer operating cycles, and increased efficiencies over current nuclear energy technologies. HALEU is not currently available from domestic suppliers. A lack of this commercial supply chain could significantly impact the development and deployment of U.S. advanced reactors and increase the risk and uncertainty for private investment in the production of HALEU.

DOE will host three virtual public hearings to share information on the process used to analyze the proposed action and alternatives, gather oral comments and feedback on the draft EIS, and enhance opportunities for public participation. The public hearings will be held on April 3, 2024. Pre-register for these virtual hearings here: https://wirestream.tv/customer/DOE/2024/publichearings/

DOE invites all interested parties to comment on the draft EIS now through April 22, 2024. Written comments received through the mail must be postmarked by April 22, 2024, to ensure consideration.

Written comments can be submitted by mail and email to the following addresses:

Mail:

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy,
Idaho Operations Office,
1955 Fremont Avenue, MS 1235,
Idaho Falls, Idaho 83415

E-mail: HALEU-EIS@nuclear.energy.gov

The comments received will help DOE refine its analysis, identify new information, and consider additional alternatives in preparation of the final EIS.

More information on the draft EIS and registration for the virtual public hearings can be found at, https://www.energy.gov/ne/haleu-environmental-impact-statement.

Miranda Lawson (she/her)
Environmental Analyst II
DOE NEPA Services

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Commenter No. 19: Paul Sullivan

From: DRENERGY
To: HALEU-EIS
Subject: [EXTERNAL] Is it possible to have the entire HALEU supply chain within the USA?
Date: Wednesday, April 3, 2024 2:35:52 PM

019-1

Dr. Paul J. Sullivan

Adviser to Energy Companies

Lecturer, Johns Hopkins
Energy and Environmental Security

Instructor, Yale Alumni College
(Economic Strategies, Oceans, Environment, Brainstorming World Issues,
Energy, Natural Resources, Supply Chains, International Trade)

Non-Resident Senior Fellow
Global Energy Center
Atlantic Council

International Advisory Panel
Windsor Energy Group (UK)

Distinguished International Fellow, National Council on US-Arab Relations

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Unless specifically stated, the sender neither supports nor criticizes any attachments to the email. All opinions expressed within the text of this email are those of the sender alone. If you have received this email in error, please advise Dr. Sullivan of that fact. This email is intended to be confidential between the sender and the recipient(s) unless otherwise stated.

Live as if you were to die tomorrow. Learn as if you were to live forever.
Mohandas Gandhi

Life can only be understood backwards; but it must be lived forwards.

Soren Kierkegaard

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019-1 Yes, it is possible. Uranium has been mined, and converted for enrichment in the United States, although currently these activities are being performed at a very low production level, and a commercial enrichment and multiple commercial fuel fabrication facilities currently operate in the United States that could produce HALEU. See Section 2.1 of the HALEU EIS for a description of these activities

Commenter No. 20: Lee Blackburn, Ohio Nuclear Free Network

From: Lee Blackburn
To: HALEU-EIS
Subject: [EXTERNAL] Comments on DOE DEIS for HALEU
Date: Friday, April 5, 2024 11:16:23 AM
Attachments: DOE DEIS HALEU Comments.pdf

Attn: Mr. James Lovejoy

Attached, please find a .pdf file containing comments on the Department of Energy's (DOE) Draft Environmental Impact Statement (DEIS) for High Assay Low Enriched Uranium (HALEU).

Respectfully,
Lee Blackburn
Ohio Nuclear Free Network

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Commenter No. 20 (cont'd): Lee Blackburn, Ohio Nuclear Free Network

DOE DEIS HALEU Comments

I am shocked that the Draft Environmental Impact Statement (DEIS) for HALEU makes no reference to potential and actual off-site contamination from HALEU production. For years now, the Department of Energy (DOE) has been dealing with the issue of enriched uranium found off-site in both a local school as well as the attic of a home some 10 miles from the Portsmouth Nuclear Site outside Piketon, Ohio. *020-1*

This is an issue of significant public health and safety that must be addressed. Ignoring it does not make it go away. Nor does saying its inconsequential. The public in surrounding communities are concerned about off-site contamination and rightfully so.

In addition, saying No Action is a viable alternative is absurd given that HALEU production is **already being performed** at the above mentioned site. *020-2*

Another absurdity is saying HALEU will be uranium enrichment of between 19.75% and 20% U-235. Even the Nuclear Regulatory Commission acknowledges this absurdity by providing American Centrifuge Operating, LLC with a license (SNM-2011) to enrich up to 25% U-235. *020-3*

On the issue of off-site contamination, in early 2019, enriched uranium was found inside Zahn's Corner Middle School (Ketterer study, April 27, 2019), 4 miles northeast of the former Portsmouth Gaseous Diffusion Plant. The Portsmouth Nuclear Site is, of course, home to the American Centrifuge Plant or ACP, where, as mentioned above, HALEU is currently being produced.

DOE commissioned an independent third-party report of a six-mile radius around the Portsmouth Nuclear Site. That independent report, known as the Auxier report, was finally released some four years later in May 2023 (Final Human Health Risk Assessment, Auxier, May 2023). Unfortunately for DOE, the Auxier report found issues of Tc-99 in locally grown produce and Pu-238 in area fish.

The discovery of enriched uranium inside Zahn's Corner Middle School led to its closure, with DOE's initial response being a disgraceful 16 page report that cited just 2 references (DOE, Sampling Analysis Report, July 2019) and fully contradicted a later, more extensive, study by the Agency for Toxic Substances and Disease Registry (ATSDR) (Health Consultation, March 29, 2024). *020-1 (cont'd)*

The initial DOE report said only naturally occurring radionuclides were found in any of the samples; saying none of the samples indicated any excess radiological risk above background to the public. Yet the ATSDR study said the average annual net concentration of all variants of uranium from an air monitor directly across from Zahn's Corner Middle School were all above background levels for the entire five-year period from 2016 to 2020.

I mention this as an example of why the public doesn't trust DOE. More importantly however, is the harm being done to the inhabitants of southern Ohio by the off-site release of enriched uranium.

020-1 The EIS does address the American Centrifuge Plant and the potential impacts associated with use of that facility as part of the Proposed Action. However, the EIS has limited ability to present site-specific impacts for future activities because DOE's Proposed Action does not entail making site-specific decisions and because the eventual site-specific decisions involve commercial activities regulated by the NRC, States, and other Federal agencies. The assessments of the Proposed Action in the EIS focus on past NEPA analysis for facilities which subject matter experts evaluated to determine the potential impact of future operations in support of the Proposed Action, including health and safety. DOE acknowledges that issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. However, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. (Section A.3.3.8 has been added to Volume 2 of the EIS discussing some of the legacy issues associated with the Portsmouth site.) As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include assessments of the existing affected environments, including health impacts from prior operations at specific locations, including, if applicable, the Portsmouth site. For additional information see Section 2.4, "Legacy Issues," of this CRD.

020-2 HALEU is being produced as part of a demonstration contract at CENTRUS. That activity was undertaken separate from the Proposed Action. Additionally, the CENTRUS effort is not a production scale effort and would not meet the needs of the Proposed Action. The No Action Alternative reflects the option of not undertaking the Proposed Action of procuring up to 290 MT of HALEU and not facilitating the establishment of a commercial HALEU fuel cycle

020-3 The commenter is correct that the NRC license for the ACO plant allows for production of uranium enriched to up to 25%. However, this limit is set to allow for operational variations in uranium enrichment. Operational history shows that small amounts of higher enriched material can occur during the uranium enrichment process. The license limit allows for small process fluctuations during enrichment to less than 20% (NRC, 2021e). The product from enrichment under this license would be HALEU of less than 20% enrichment. While generally limited to possessing uranium enriched to less than 20%, a licensee is allowed to possess small quantities

Commenter No. 20 (cont'd): Lee Blackburn, Ohio Nuclear Free Network

For instance, in August 2022, Joseph Mangano, Executive Director of the Radiation and Public Health Project, released an epidemiological study which found that Pike County's cancer rates in 2010-2019 was the highest among all 88 counties in Ohio. In addition, in 2009-2020, the cancer death rate was some 50% higher than the U.S., for all age groups except for persons over 75 (Mangano study, August 15, 2022). Pike County is the home to the ACP.

In addition, the Department of Labor has paid out some $1.3 billion in medical and compensation to former Portsmouth Gaseous Diffusion Plant workers and their families.

Finally, simultaneously with the first production of HALEU at the ACP in October 2023, independently owned air monitors near the facility registered higher than typical levels of enriched uranium.

So, if DOE truly intends to be protective of the environment and public safety, you need to seriously rethink the issues of public and occupational health under **all** operational circumstances.

Respectfully,
Lee Blackburn
Ohio Nuclear Free Network

020-1 (cont'd)

of uranium enriched above 20% in U-235 (as much as 5 kg) when licensed as a Category II facility. (See Section 1.0.5.1 of the HALEU EIS for Facility Category definitions. The Proposed Action addresses an enriched uranium product [HALEU] with enrichment levels of at least 19.75 weight percent and less than 20 weight percent.)

Commenter No. 21: Madison Schroder, Generation Atomic

From: Madison Schroder
To: HALEU-EIS
Subject: [EXTERNAL] HALEU Environmental Impact Statement Comments- Generation Atomic
Date: Friday, April 5, 2024 2:20:44 PM
Attachments: HALEU EIS Statement- Generation Atomic.pdf

Mr. James Lovejoy,

Attached below is public comment for the HALEU Environmental Impact Statement on behalf of Generation Atomic.

Please let me know if you have any questions, and thank you for the opportunity to submit comments.

Madison Schroder
Policy Coordinator
Generation Atomic

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Commenter No. 21 (cont'd): Madison Schroder, Generation Atomic

Generation Atomic
1878 Pascal Street
Saint Paul, MN 55113

April 5th, 2024

To the Department of Energy HALEU EIS Committee,

Thank you for the opportunity to provide testimony on the Draft Environmental Impact Statement (EIS) for the U.S. Department of Energy's proposed acquisition of high-assay low-enriched uranium (HALEU) and facilitation of commercial HALEU production. We, Generation Atomic, would like to express our strong support for this important initiative and provide comments on the proposed draft.

Generation Atomic is a non-profit organization that advocates for the development and deployment of nuclear power. We believe that nuclear energy, including those advanced reactors fueled by HALEU, will play a vital role in decarbonization and achieving a clean energy future.

After reviewing the Draft EIS, we are pleased to see that the potential environmental impacts of the proposed HALEU activities have been evaluated as minimal and manageable. The EIS thoroughly analyzes the uranium fuel cycle activities associated with HALEU production and concludes that the environmental consequences are generally small to moderate. Importantly, the moderate impacts tend to be associated with site-specific conditions or temporary construction activities rather than the HALEU operations themselves. This demonstrates that with proper planning and mitigation measures, HALEU can be produced in an environmentally responsible manner.

The EIS also correctly highlights that the Proposed Action will result in significantly lower greenhouse gas emissions compared to generating the same amount of electricity from existing non-nuclear sources. Specifically, the use of HALEU fuel produced under the Proposed Action could lead to a reduction of 47.4 to 326 million metric tons of CO2 equivalent emissions compared to existing non-nuclear sources. This substantial reduction in emissions underscores the critical role that advanced nuclear reactors can play in mitigating climate change.

021-1 **021-1** DOE acknowledges your support for the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

021-2 **021-2** Thank you for your comment. Please also see the discussion in Section 2.1, "Support and Opposition," of this CRD.

Commenter No. 21 (cont'd): Madison Schroder, Generation Atomic

Further, the Proposed Action is expected to generate significant positive economic impacts. Establishing a domestic HALEU supply chain will create jobs, stimulate investment, and bolster America's leadership in nuclear power technologies. This will not only benefit the communities where HALEU facilities are located but also contribute to the Nation's energy security and competitiveness in the global clean energy race.

021-2 (cont'd)

In addition to the environmental and economic benefits, the development of a robust HALEU infrastructure is critical for enabling the deployment of many advanced reactors. These innovative designs offer improved safety and efficiency, and the potential for diverse applications such as industrial heat and hydrogen production. By providing the necessary fuel for these reactors, the Proposed Action will help unlock their immense potential to decarbonize our energy system and combat climate change.

021-3

In conclusion, Generation Atomic strongly supports the Department of Energy's efforts to establish a commercial HALEU supply chain. The Draft EIS demonstrates that this can be done in an environmentally responsible way while delivering substantial economic and clean energy benefits. We urge the Department to move forward with this vital initiative and ensure that America remains at the forefront of advanced nuclear innovation.

021-1 (cont'd)

Thank you for considering our testimony.

Eric Meyer
Executive Director
Generation Atomic

Madison Schroder
Policy Coordinator
Generation Atomic

021-3 DOE acknowledges your support for the Proposed Action and development of a robust HALEU infrastructure. Please refer to Section 2.1, "Support and Opposition," and Section 2.2, "Purpose and Need," of this CRD for a discussion of these topics and DOE's response.

Commenter No. 22: Ryan Sedgeley

From: Ryan Sedgeley
To: HALEU-EIS
Subject: [EXTERNAL] Stop Funding Uranium Enrichment and Nuclear Power
Date: Monday, April 8, 2024 8:10:30 PM

Dear DOE Administrator,

Nuclear is a bad deal for everyone involved. I am appalled that the DOE is even considering more subsidies to enrich uranium for HALEU fuels. As someone that lives near where uranium has been mined I can tell you first hand, nuclear energy is anything but clean. It poisons our water and air here and is a silent killer across the western United States. In addition to the deadly impacts on local areas subject to uranium mining, there is still no permanent safe repository for high level waste including spent fuel rods. Until these two issues can be mitigated the DOE should not continue to subsidize this deadly industry. The DOE needs to consider the entire life-cycle of nuclear fuels and energy. *022-1* *022-2* *022-3* *022-1 (cont'd)* *022-4*

I am also deeply concerned about the waste of taxpayer dollars on speculative reactors that have fundamental problems. The "Natrium" reactor uses a sodium coolant that has been proven dangerous and problematic over and over again and has been abandoned at each attempt. While the engineering possibilities are attractive, the payoff is not worth the amount of tax payer dollars set to be spent on this experiment. This is especially true given that there is no supplier of the specialized fuel needed to operate this novel reactor. Building facilities to produce this fuel for one EXPERIMENTAL reactor is absurd and deeply wasteful. On top of that, these facilities are subsided on every level by taxpayers including insuring them against calamity. It is a parasitic welfare industry from start to finish and rate payers and taxpayers get taken advantage of. *022-5*

Climate change is a threat to all of our lives and we must take action immediately. This means deploying proven and safe technology now. Nuclear power plants take a decade at best to be built, we don't have that time and cutting regulations to speed things up is insane and reckless. Just look to Boeing as an example, hundreds of people die when a plane drops out of the sky, millions could be killed and sickened if a nuclear plant has a problem. You can and should instead focus your efforts on funding rooftop virtual power plants and storage across the country. You should be focused on enhanced geothermal, geothermal loop systems, reconductoring, and the variety of other proven technologies that can be rolled out today. It doesn't have to be perfect, it just needs to happen and fast. *022-6* *022-7*

Finally, the DOE needs to take threats of security very seriously. My understanding is that these reactors produce plutonium. This incredibly deadly material is not only a threat to the lives and communities that could be exposed during an accident, but also pose a risk by bad actors wanting to steal or intentionally use the materials for harming other people. The deployment of "small modular reactors" creates additional vulnerabilities because of their proposed distribution. We cannot expect political stability going forward and the threat from right-wing terrorism, including threats of states that go rogue, must be considered and taken seriously. *022-8*

Please stop this wasteful dangerous plan. I beg you, for the sake of our children and grandchildren, focus on PV, wind, geothermal, and other safe proven tech. We don't have time to waste and should not have to pay for the engineering adventurism of a billionaire. *022-1 (cont'd)*

Take Care,

Ryan C. Sedgeley

He/Him/His

022-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," and Section 2.2 "Purpose and Need," of this CRD for additional information. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action.

022-2 The Proposed Action does not include selecting site-specific locations; site-specific locations are expected to be proposed in the future and would be evaluated by the cognizant regulatory agency, in many cases the Nuclear Regulatory Commission (NRC). Because the Proposed Action involves numerous actions (e.g. mining, enrichment, deconversion, etc.) and does not propose to select site-specific locations, given the potential possibilities of all actions and locations, it would not be reasonable to accumulate and assess operating and environmental data for all potential activities. DOE acknowledges the lack of site-specific locations in its EIS and consistent with 40 C.F.R. 1502.21 includes a detailed explanation, in the EIS, Appendix A, and the Technical Report (Leidos, 2023) of the credible information that its analysis is based on as well as the research and evaluation methodologies used by DOE to extrapolate reasonably foreseeable impacts. However, in the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Section A.1.3.12, a discussion of mining and milling legacy issues, has been added to Volume 2 of the EIS. Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices.

Commenter No. 22 (cont'd): Ryan Sedgeley

[redacted]
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See Section 2.4, "Legacy Issues," of this CRD for more information.

022-3 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please see the response to Comment 0022-2 and refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 22 (cont'd): Ryan Sedgeley

022-4 Thank you for your comment. The EIS does analyze all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6 of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

022-5 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Commercialization of the HALEU fuel cycle would provide incentive for companies to invest in the development of HALEU fuel production capabilities which in turn would provide advanced reactor developers with the surety that fuel would be available for their reactor designs. Sections S.8.1.7, 2.1.7.2, 3.7.2, and A.7.2 of the EIS, along with Section 8 of the Leidos Technical Report (Leidos, 2023), address the reasonably foreseeable activity of advanced nuclear reactor operation with HALEU to the extent practicable. There are a number of proposed reactors other than Natrium that plan to use HALEU. For example, X-energy, Oklo, Kairos, Westinghouse, and Ultra Safe Nuclear have plans to use HALEU (see Technical Report Leidos 2023 Section 8.1.3). An in-depth analysis of advanced reactors is not ripe for this EIS and therefore, consideration of specific reactor accidents and impacts for specific advanced reactor designs are out of scope for this EIS. However, the safety of proposed advanced reactors, including those that use sodium as a coolant, are expected to be addressed during the licensing of an advanced nuclear reactor. The licensing process for advanced reactors, that would be undertaken in the future by the cognizant regulatory authority would be expected to consider a comprehensive set of accident sequences and the likelihood and consequences of these accidents. The analyses for these accidents may consider that the Experimental Breeder Reactor (EBR)-II and the Fast Flux Test Facility (FFTF) demonstrated safe operation with sodium as the coolant. The advanced nuclear reactors would be designed to prevent or mitigate the consequences of accidents considered by the reactor designers. Regarding funding, please see Section 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 22 (cont'd): Ryan Sedgeley

022-6 Thank you for your comment. As stated in the EIS, one of the aspects of a clean energy future is sustainment and expanded development of safe and affordable nuclear power. The Proposed Action is a component of this initiative.

022-7 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives.Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Even with the timeline the commenter identified, nuclear could contribute to the reduction in carbon emissions by then. And, it can be done without shortcutting regulations. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," for further information.

022-8 Reactors that utilize HALEU as fuel produce substantially less plutonium than conventional reactors. The NRC would be the responsible regulatory authority for any HALEU fuel cycle facility that would possess HALEU (enrichment to HALEU enriched in uranium-235 to 10% and above, HALEU deconversion, HALEU storage, HALEU fuel fabrication). The NRC promulgated regulations at 10 C.F.R. Part 37 in 2013 to establish security requirements for the transportation and use of category I (strategic special nuclear material) and category II (special nuclear

Commenter No. 22 (cont'd): Ryan Sedgeley

material of moderate strategic significance) radioactive materials. As stated in the HALEU EIS, the HALEU that would be produced under the Proposed Action is considered a category II material. Therefore, these facilities would need to meet the NRC requirements for a facility possessing this category II material. Facilities that possess category II quantities of special nuclear material (SNM) would need to implement additional security measures beyond those required for category III (special nuclear material of low strategic significance). These measures could include: access controls, such as background checks; controlled access area (CAA) portals and vehicle access; escort requirements; random entry and exit searches; alarm stations; security patrols; communication and coordination with law enforcement; and a security equipment maintenance program. The NRC would undergo an additional case-by-case review for HALEU facilities to determine the need and extent of supplemental security measures beyond the requirements in the regulations necessary to ensure adequate protection of public health and safety and common defense and security. There are nuclear facilities within the US that currently are required to meet these security requirements (and the more stringent requirements for Category I material). DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. DOE expects that intentional destructive acts (e.g., terroristic acts) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns" of the HALEU EIS." Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 23: Gloria McCloskey

From: Gloria McCloskey
To: HALEU-EIS
Subject: [EXTERNAL] Money
Date: Monday, April 8, 2024 7:32:53 PM

We do not need any more government subitizing of coal or oil
they leave a mess when closing or going under, and have a complete disregard of the land, people's, environment, and my water well. Case in point
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023-1

023-1 This comment falls outside the scope of the HALEU EIS. The Proposed Action does not include coal or oil as an energy source. The EIS does note that if the No Action Alternative were selected, the Proposed Action would not be undertaken and where no significant HALEU production ever materializes, existing electrical generation capacity and associated fuel sources would continue to operate. Traditional electricity generation sources, including LWRs, hydropower, solar, wind- and fossil-fueled plants, would continue to be relied on to supply our nation's energy demand and energy security. See Section 2.8, "Out of Scope," for additional information.

Commenter No. 24: Jeffery and Arlene Holomon

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] Re: Nuclear power
Date: Monday, April 8, 2024 6:44:20 PM

Since the DOE is asking for our comment on its proposed decision to acquire HALEU to encourage commercial development of this kind of nuclear fuel.

We vote NO as we don't need more taxpayer subsidies for nuclear power. ▮ ***024-1***

Jeffery & Arlene Holomon
[redacted]

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024-1 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 25: Debra Higbee

From: Debra Higbee
To: HALEU-EIS
Subject: [EXTERNAL]
Date: Tuesday, April 9, 2024 3:56:25 PM

Dear Decision Maker,

We DO NOT need more taxpayer subsidies for nuclear power. I am a taxpayer, and I do not support throwing away money, which is what happens when investing in nuclear energy. It's too expensive, too slow to be built and is not a climate solution. My hometown is Salt Lake City, Utah, and UAMPS (Utah Associated Municipal Power Systems) had an agreement with NuScale to support their SMR in Idaho. It turned out to be a scam. It was too expensive, too slow, and is not a climate solution as they advertised. UAMPS finally needed to break the contract. The Biden Administration needs to understand that the problems with NuScale are the rule, not the exception. So please do not subsidize or pour money into HALEU. It highly radioactive, and the SMRs that it will be used for is a similar failed solution to climate change for the reason stated above. And below are more reasons to reject this project. ***025-1***

I appreciate your time,
Debra Higbee
[redacted]

-DOE must disclose the total amount of taxpayer money they plan to spend on this project so the public is aware of the true cost of subsidizing the nuclear fuel cycle. ***025-2***

-DOE should be conservative in its spending and its estimate of need for HALEU. The DOE's analysis is based on speculative nuclear power plant projects that will likely never get built. ***025-3***

-Companies building new nuclear power plants should bear the risks and costs just like any other industry. The federal government shouldn't subsidize this industry with more taxpayer dollars. ***025-4***

-The DOE should consider the full opportunity cost of spending taxpayer dollars on HALEU as opposed to other projects DOE could be supporting, such as renewable energy research & development - projects that would be able to be deployed in a short time frame to be an effective solution to climate change. In contrast, new nuclear power plants take years - or decades - to design and build, and they won't come online fast enough to address climate change or other environmental issues related to energy production. ***025-5***

-DOE must consider the full life cycle impacts of its proposal, including the negative impacts of additional uranium mining and milling, transportation of fuels, and waste disposal. ***025-6***

-DOE must acknowledge that there is no permanent disposal facility for ***025-7***

025-1 Utah Associated Municipal Power Systems (UAMPS) and NuScale's SMR designs operate on low-enriched uranium (LEU) and not HALEU and are not part of the Proposed Action. DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

025-2 DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

025-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Regarding comments about the speculative nature of the advanced reactors, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's response.

025-4 DOE acknowledges your comment, but also notes that in the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic

Commenter No. 25 (cont'd): Debra Higbee

nuclear waste in the U.S. and until such a facility exists new nuclear power plants are unwise. We shouldn't be creating new nuclear waste when we have no place to safely and permanently store the waste that already exists.

025-7 (cont'd)

research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see the discussions in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

025-5 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Section 2.2 "Purpose and Need," of this CRD for a discussion of this topic and DOE's response. Renewable energy projects would not meet the purpose and need and are outside the scope of the HALEU EIS. Please refer to Section 2.8, "Out of Scope," of this CRD for discussion of this topic and DOE's response. It is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles.

025-6 Thank you for your comment. The EIS does analyze all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6 of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 25 (cont'd): Debra Higbee

025-7 As illustrated in Sections 1.0.5.2, 2.1 and the remainder of the EIS document and supporting Technical Report (Leidos 2023), the entire cycle of HALEU from mining to enrichment to reactors to spent fuel is considered in the EIS. DOE acknowledges that there is currently no permanent waste repository. However, the HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, HALEU Spent Nuclear Fuel Storage and Disposition, HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 26: Rodney Knudson

From: Rodney Knudson
To: HALEU-EIS
Subject: [EXTERNAL] HALEU reactors
Date: Tuesday, April 9, 2024 12:10:40 PM

Dear Sirs,

It strikes me that there was a surge in the building of nuclear reactors following the development of nuclear bombs and their use. To greenwash this horror it was decided to employ nuclear fission in peaceful applications; i.e., building nuclear reactors to produce electricity. And today there are hundreds of nuclear reactors around the world many of which are being deactivated. One of the problems experienced has been meltdowns with catastrophic consequences: Three Mile Island; Chernobyl, Fuskushima are the most notable examples. Large swathes of land have in some cases been made uninhabitable accompanied by carcinogenic health impacts on both human and wild life. The long term consequences of these incidents will be manifested in genetic abnormalities experienced in generations to come. The cost of this is underestimated for sure. ***026-1***

Nuclear waste has no place to be reposited. Yucca Mountain was supposed to be such a facility and was constructed at the cost of several billions of dollars only to find that there was water communication with the cavities and that there was the possibility of ground water contamination possibly even as far as Los Vegas located some 80 miles SE of the repository. Generating more nuclear waste that requires at least ten but some say 20 half-lives before these nuclear wastes lose their radioactive impacts on living things doesn't make sense. Given that we have such a limited time left before the carbon dioxide, nitrogen oxides and methane accumulation in the atmosphere reach a tipping point where the damage is irreversible, the expense and time required to build a nuclear reactor and the dangers of meltdowns, it make more sense to pursue solar and wind generation with battery park backups. With all this in mind Germany has backed away from nuclear power. It remains to be seen what France will do because of their heavy reliance on nuclear power. What is frightful is the proxy war we have going on in the Ukraine with several nuclear reactors in jeopardy. Anyway, doing the same thing over and over again and expecting a different result was given a definition by Albert Einstein: insanity. ***026-2***

Given the limited time we have left to addressed the global climate crisis there ***026-3*** ***026-3 (cont'd)***

026-1 The commenter mentions three incidents involving nuclear reactors and ascribed consequences. In the Volume 1 glossary definition of radiation effects, the EIS addresses somatic and genetic effects of radiation exposure. DOE acknowledges that accidents have occurred in the past. DOE, other nuclear regulators, and the nuclear industry have taken the opportunity to learn from past accidents. Costs and specific reactor accidents and consequences for advanced reactor designs are out of scope for this EIS. However, as part of the licensing process for advanced reactors, DOE expects that the cognizant regulatory authority will perform analyses to consider various accident sequences and the likelihood and consequences of these accidents. The advanced nuclear reactors would be expected to be designed to include features that make the reactors passively safe and preclude the occurrence of accidents mentioned by the commenter and also prevent or mitigate the consequences of other accidents considered by the reactor designers.

026-2 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing

Commenter No. 26 (cont'd): Rodney Knudson

are limited approaches to solving this problem: solar and wind and perhaps hydroelectric. Nuclear is not the answer. We should all be looking at China, as it is showing us the way. They are producing solar panels at a massive scale and I believe wind generators as well. Tesla's solar generating plant with battery farm in Australia is another example.

026-3 (cont'd)

of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. See section 2.6.1.10 for more information. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

026-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics. Renewable energy projects would not meet the purpose and need and are outside the scope of this EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 27: David Lee Beidelman

From: David Beidelman
To: HALEU-EIS
Subject: [EXTERNAL] Comments on HALEU EIS
Date: Tuesday, April 9, 2024 12:34:59 AM

Dear Mr. Lovejoy,

I have the following comments on this EIS as follows:

1. The EIS is inadequate. This is primarily due to the fact that the EIS does not address the environmental effects of the need to store and dispose of the additional spent fuel that would be created. As you know, the United States does not yet have an approved facility for the disposal of spent nuclear fuel. ***027-1***

2. Because of the prior comment, I strongly support S.10.1.2, the No Action Alternative. ***027-2***

David Lee Beidelman
[redacted]

Sent from my iPad

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027-1 As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

027-2 DOE acknowledges your support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

Commenter No. 28: Ed Koncel

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] No to Subsidizing TerraPower and HALEU
Date: Wednesday, April 10, 2024 3:04:10 PM

Hi—

For a number of years in the 1970's I worked around nuclear power plants conducting surveys on the effects of the plants on the surrounding environment. Even back then there was concern about what to do with nuclear waste that would take thousands of years to decay to a point that it was no longer threatening human and animal life. In addition to the tens or hundreds of thousands of years this waste must be stored to reach that point, consideration must be given to the full life cycle impacts of nuclear fuel, including the negative impacts of uranium mining and milling as well as the costs and dangers posed by transportation of these fuels. ***028-1***

Now, to propose spending even more tax money on HALEU (high-assay low-enriched uranium) fuel for this unproven technology is even more unwise! This money could be better spent exploring and developing more reliable sources and forms of renewable energy. ***028-2***

To me, spending billions of tax dollars on unproven technology without solving the problems created by this technology is an unwise decision for now and for future generations. I hope you will make the wise decision and not subsidize this technology or its fuel. ***028-3***

Ed Koncel
[redacted] ***028-4***

028-1 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

028-2 Thank you for your comment. The EIS does analyze all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6

Commenter No. 28 (cont'd): Ed Koncel

of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

028-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Section 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a discussion of this topic. Renewable energy would not meet the purpose and need and is outside the scope of this EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

028-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

Commenter No. 29: Maria Katherman

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] Proposed nuclear power plant in Wyoming & taxpayer money
Date: Wednesday, April 10, 2024 8:01:29 PM

Dear DOE staff;

I live in Wyoming and have become progressively more distressed as money is poured into the proposed natrium power plant supposedly sponsored by Bill Gates, but more accurately by US taxpayers. This industry has a very bad track record of over spending estimated budgets and not meeting stated time-lines. Particularly in the case of this experimental plant that the people of Wyoming were never consulted about. *029-1*

It is time for the DOW to really tell us the total amount of taxpayer money that has been spent and that they plant to spend in the future. If the public realizes the true cost of subsidizing the building of this plant as well as the cost of subsidizing the HALEU fuel cycle, it might get the attention it deserves instead of being unknown to people outside of Wyoming.

This is an industry like any other, and yet it is not treated that way. It is a vast hole of speculation at no risk because it is based on spending tax dollars. Compare it truthfully to wind or solar for timeline and success of projections! If this plant is ever built (which I doubt) it will contribute minimally to the grid. Wyoming already produces excess power from existing coal/gas plants and coming wind and solar projects.

At huge cost and risk this plant would never be thought about because it will take so long to bring the technology to market scale. It is just a waste and a dangerous, risky waste at that. Compare what is being spent just on producing HALEU with where that money could go in refining solar or wind technology!

Here in Wyoming the uranium mining companies left abandoned tailings and unusable water tables from the previous boom in uranium demand. This will not be different and what for, when renewable energy is the proven answer. *029-2* *029-3*

And, of course, the elephant in the room: what is to become of the nuclear waste. It is now sketched out to be "temporarily" stored on site. Temporarily, like for the next 10,000 years. This problem already exists and should be solved BEFORE spending tax dollars on generating more of the stuff. Honestly. The whole project is just a colossal boondoggle. *029-4* *029-1 (cont'd)*

Thank you for your attention, I hope for more transparency about the costs and some attention to public comments. *029-5*

--Maria Katherman

[redacted]

029-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for further discussion of these topics. The cost of the proposed Natrium power plant falls outside the scope of this EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information about costs.

029-2 Thank you for your comment. Potential impacts to water resources from mining activities under the Proposed Action including impacts from tailings impoundments are analyzed in the EIS (Volume 1, Section 3.1.4). Additional details related to water quality and potential contaminants resulting from mining activities have been added to the final EIS (Volume 1, Section 3.1.4). DOE acknowledges that issues could exist at a HALEU mining facilities with unresolved legacy contamination. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include assessments of the existing affected environments, including health impacts from prior operations at specific locations. For additional information see Section 2.4, "Legacy Issues," of this CRD.

029-3 Please see response to Comment 029-1.

029-4 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power

Commenter No. 29 (cont'd): Maria Katherman

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reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

029-5 All public comments are responded to in this CRD and have been considered in preparing the Final HALEU EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information related to costs of the Proposed Action.

Commenter No. 30: Jeri Fry

From: Jeri Fry
To: HALEU-EIS
Subject: [EXTERNAL] test
Date: Wednesday, April 10, 2024 3:39:34 PM

030-1

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030-1 This document contained no comments.

Commenter No. 31: Dudley Case

From: M. Dudley Case
To: HALEU-EIS
Subject: [EXTERNAL] HALEU Comments
Date: Friday, April 12, 2024 5:07:39 PM

To Whom It May Concern:

My comments on the HALUE-EIS are as follows:

DOE should disclose the total amount of taxpayer money they plan to spend on this project so the public is aware of the true cost of subsidizing the nuclear fuel cycle. ***031-1***

DOE should be conservative in its spending and its estimate of need for HALEU. The DOE's analysis is based on speculative nuclear power plant projects that will likely never get built. ***031-2***

Companies building new nuclear power plants should bear the risks and costs just like any other industry. The federal government shouldn't subsidize this industry with more taxpayer dollars. ***031-3***

The DOE should consider the full opportunity cost of spending taxpayer dollars on HALEU as opposed to other projects DOE could be supporting, such as renewable energy research & development - projects that would be able to be deployed in a short time frame to be an effective solution to climate change. In contrast, new nuclear power plants take years - or decades - to design and build, and they won't come online fast enough to address climate change or other environmental issues related to energy production. ***031-4***

DOE must consider the full life cycle impacts of its proposal, including the negative impacts of additional uranium mining and milling, transportation of fuels, and waste disposal. ***031-5***

DOE must acknowledge that there is no permanent disposal facility for nuclear waste in the U.S. and until such a facility exists new nuclear power plants are unwise. We shouldn't be creating new nuclear waste when we have no place to safely and permanently store the waste that alre-ady exists. ***031-6***

Thank you for your attention to my comments.

Dudley Case
[redacted]

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031-1 DOE acknowledges your concern regarding the cost of the HALEU program. DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

031-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Regarding comments about the speculative nature of the advanced reactors, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's response.

031-3 DOE acknowledges your comment, but also notes that in the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see the discussion in Sections

Commenter No. 31 (cont'd): Dudley Case

2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

031-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Section 2.2, "Purpose and Need," of this CRD for a discussion of this topic and DOE's response. Renewable energy projects would not meet the purpose and need and are outside the scope of the HALEU EIS. Please refer to Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for further discussion of these topics and DOE's responses. It is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles.

031-5 Thank you for your comment. The EIS analyzes all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6 of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

031-6 DOE acknowledges that there is currently no permanent waste repository. SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the

United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 32: Tudor Marks

From: Tudor Marks
To: HALEU-EIS
Subject: [EXTERNAL] Proposed acquisition of HALEU for nuclear power
Date: Saturday, April 13, 2024 7:08:52 PM

I have the following comments:
* The proposed users of the HALEU fuel do not currently exist and will take years for design and build making acquisition of HALEU a speculative venture using tax dollars. A speculation of this magnitude should be undertaken by private industry not the government. ***032-1***
* The nuclear plants which would be the end users of the product would not come online quickly enough to address the critical climate change issues we face. ***032-2***
* There is no current permanent disposal facility for nuclear waste in the U.S., making nuclear plants an unreasonable option. ***032-3***
* The costs of HALEU acquisition could be better spent supporting increased research and deployment of renewable energy options. ***032-4***

Thank you for the opportunity to comment.
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032-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. DOE acknowledges your preference for not using taxpayer money; however, in response to a Request for Information Regarding Planning for Establishment of a Program to Support the Availability of High-Assay Low Enriched Uranium (HALEU) for Civilian Domestic Research, Development, Demonstration, and Commercial Use (86 Federal Register 71055, December 2021) (referred to as the "RFI"), many responses from industry indicated a potential timing/coordination issue with developing domestic commercial HALEU enrichment capability. Those interested in designing, building, and operating advanced reactor designs that use HALEU fuel were hesitant to invest in the technology without a firm source of HALEU fuel. Likewise, those interested in providing HALEU fuel were hesitant to invest in facilities without a firm demand. As described in multiple responses to the RFI, this is a "chicken-and-egg" dilemma. To address this issue, an initial public/private partnership, in the form of the Proposed Action, was proposed to accelerate development of a sustainable commercial HALEU supply capability. If successful, this partnership could provide the incentive for the private sector to incrementally expand the capacity in a modular fashion as a sustainable market develops. Until that time, initial subsidies are needed to help stimulate these industries. Regarding your comment about the speculative nature of the ventures, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. Please refer to Sections 2.1, "Support and Opposition," 2.2, "Purpose and Need," and 2.8, "Out of Scope," of this CRD for a further discussion of these topics and DOE's responses.

032-2 DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this

Commenter No. 32 (cont'd): Tudor Marks

information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Please refer to Section 1.1 of the EIS Vol. 1, and Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for further discussion of this topic and DOE's response. It is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the alure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles.

032-3 DOE acknowledges that there is currently no permanent waste repository. SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing

Commenter No. 32 (cont'd): Tudor Marks

of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

032-4 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Supporting increase research and development of renewable energy options as mentioned by the commenter, would not meet the Purpose and Need (see Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. Those actions would not facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. The Inflation Reduction Act of 2020 contained billions of dollars for such activities. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussions in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 33: Kay Denniston

From: Kay Denniston
To: HALEU-EIS
Subject: [EXTERNAL] HALEU
Date: Sunday, April 14, 2024 3:50:31 PM

i AM STRONGLY OPPOSED TO THE PRODUCTION OF HALEU. We live a community effected by the Lincoln Park /cotter superfund site . This nuclear industry is NOT CLEAN ENERGY. It has been years and the site is still not cleaned up!
Kay Denniston [redacted]
****
This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.

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033-1
033-2

033-1 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

033-2 DOE acknowledges your concerns about the Lincoln Park Superfund Site which was previously operated as a uranium processing facility. In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Mining and milling operations have, in particular, resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. However, previously contaminated sites are not in the scope of the Proposed Action and therefore are not evaluated in this EIS. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD. The uranium ore mined and processed to produce the HALEU under the Proposed Action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no mining/milling wastes with unique characteristics. All mining/milling wastes have a path to disposal. Waste quantities generated would represent small fractions of the commercial facilities' capacities. As stated in Section 2.6.1.10, waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. Also, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management.

Commenter No. 34: Joseph Mangano

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] Comment on EIS - Joseph Mangano
Date: Wednesday, April 17, 2024 1:13:35 PM

Mr. James Lovejoy, DOE EIS Document Manager

U.S. Department of Energy

By Email HALEU-EIS@nuclear.energy.gov

Dear Mr. Lovejoy:
Please accept the following comments to the recent draft Environmental Impact Statement (EIS) by the U.S. Department of Energy analyzing impacts of the proposed action to acquire high-assay low-enriched uranium (HALEU) at the Portsmouth site in Ohio.

The EIS does not include any reference to offsite environmental radioactivity contamination near Portsmouth. Testing by Dr. Michael Ketterer, professor emeritus of chemistry and biochemistry at Northern Arizona University, has detected various radionuclides in the Portsmouth area. A summary of Dr. Ketterer's work can be found at https://local12.com/news/investigates/is-there-a-danger-on-our-doorstep-cincinnati-ohio-indiana-kentucky-duane-pohlman-cancer.

Evidence of such contamination raises the issue of whether the health of the local population has been adversely affected. However, nowhere in the EIS is this issue addressed. Any assumption that radioactivity is not harmful to health – regardless of the levels of this radioactivity - without review of epidemiological and medical studies is dangerous.

In the past 18 months, two studies of local health near Portsmouth have been released. The first reviewed health data from the U.S. Centers for Disease Control and Prevention, and the Ohio Cancer Registry.

Pike County's current (2010-2019) cancer incidence rate was the highest of all 88 Ohio counties. In addition, the county's current (2017-2020) premature mortality rate (< age 75) was 85% above the U.S. This gap has significantly worsened since the early 1990s (when it was only 2% higher), and is one of the highest death rates of all 3,100 U.S. counties (https://radiation.org/rphp-report-finds-soaring-death-rate-near-ohio-uranium-plant/).

A second report showed the current premature death rate for the seven-county area closest to Portsmouth was 77% above the U.S., and well above the rate for Ohio counties with comparable socioeconomic problems. These data suggest that potential hazards from Portsmouth may extend beyond the Pike County border (https://radiation.org/wp-content/uploads/2023/06/Portsmouth-2nd-report-final.pdf).

While not required by regulations, it is extremely important that the Department of

034-1

034-1 The HALEU EIS will inform DOE's decision whether to (1) Facilitate the establishment of commercial HALEU fuel production capability and (2) Acquire (through HALEU as enriched uranium hexafluoride and deconversion services) from commercial sources, up to 290 MT of HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance. It does not support decisions on the selection of specific sites for all of the activities, including enrichment, needed to implement a commercial HALEU fuel cycle. DOE acknowledges concerns regarding HALEU nuclear fuel cycle facility sites with unresolved legacy contamination. However, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. An assessment of the affected environments, including health impacts from prior operations at specific locations, is not appropriate for this EIS but would be included in future NEPA analysis by the relevant regulatory authority for sites ultimately identified as potential locations for fuel cycle activities. A discussion of the various studies addressing the impacts of the radiological environment surrounding the Portsmouth site should be included in the site specific NEPA analysis if the site were selected as a location for enrichment of uranium to the HALEU enrichments associated with the Proposed Action. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. For additional information see Section 2.4, "Legacy Issues," of this CRD.

Commenter No. 34 (cont'd): Joseph Mangano

Energy recognize and address patterns of radioactive contamination near Portsmouth, along with patterns of morbidity and mortality, before any decision to proceed with acquisition of HALEU at the site.

34-1 (cont'd)

Joseph Mangano MPH MBA
Executive Director
Radiation and Public Health Project
[redacted]

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Commenter No. 35: Patricia Marida, Ohio Nuclear Free Network

From: Pat Marida
To: HALEU-EIS
Cc: Joe Mangano
Subject: [EXTERNAL] Requesting Extension for HALEU DEIS Comments
Date: Wednesday, April 17, 2024 1:31:06 PM

Dear Mr. Lovejoy,

We respectfully request an extension of comments on the DEIS for HALEU. *035-1*

We believe that sixty days would be better than 30 days. Looking at environmental impacts from so many industries – uranium mining, milling, and enrichment, the operation of the reactors themselves, and the ongoing isolation of radioactive waste is an enormous undertaking. Commenters need time to review these industries.

We would also like to request that the HALEU Scoping Comments be made available to the public. We have not been able to find them at the links provided. It would be extremely helpful if these could be made easily searchable by the public. *035-2*

Thank you for your consideration.

Sincerely,

Patricia Marida, coordinator,
The Ohio Nuclear Free Network
316 North Michigan Street, Suite 520
Toledo, OH 43604

Joseph Mangano, Executive Director
The Radiation and Public Health Project
P.O. Box 1260
Ocean City, NJ 08226

035-1 The formal comment period started March 8, 2024, and continued until April 22, 2024, which was a 45-day comment period. DOE-NE began accepting comments with the publication of the DOE Notice of Availability (NOA) on February 29, 2024, more than a week prior to EPA's publication of the NOA and accepted comments submitted past the end of the comment period to the extent practicable. While NE understands time is needed to meaningfully review the Proposed Action activities, previous practices have proved that 45-days is generally sufficient to receive stakeholder input. Therefore, DOE did not feel a formal comment period extension was warranted. Please reference the response provided in Section 2.7, "NEPA Process," for further discussions about comment extensions.

035-2 DOE evaluated and considered all comments received during the Scoping process. The comments received are summarized in Section 4 of this CRD.

Commenter No. 36: Diane D'Arrigo, Nuclear Information and Resource Service

Nuclear Information and Resource Service * Beyond Nuclear
Ohio Nuclear Free Network * Uranium Watch
Coalition for A Nuclear Free Great Lakes * Don't Waste Michigan
Sustainable Energy and Economic Development Coalition

Mr. James Lovejoy
HALEU EIS Document Manager
U.S. Department of Energy, Idaho Operations Office
1955 Fremont Avenue, MS 1235, Idaho Falls, Idaho 83415
HALEU-EIS@nuclear.energy.gov
lovejojb@id.doe.gov
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April 17, 2024

RE: Request for 90-day extension on comment period on DOE/EIS–0559 *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)* (Draft HALEU EIS)

We thank DOE for opening a comment period and holding a few public listening sessions on the Draft HALEU EIS because it would make an enormous shift in the direction of communities, the country and world. Because of the major significance of the proposal, we ask for 90 days more time to comment. ***036-1***

Plans for a new generation of nuclear reactors that would use High-Assay Low-Enriched Uranium (HALEU) could directly impact scores of communities across the US (and more internationally) in the mining, milling, conversion and reconversion, enrichment, fuel fabrication, reactor operation, and management/"disposal" of uranium tailings, "low-level" and high-level radioactive waste and eventual decommissioning. This is consistent with information in the Draft HALEU EIS assessment that the 6 steps in HALEU fuel chain and the resulting waste from every link in that chain will affect many locations and the national energy policy overall. ***036-2***

This heightens the importance of this process above many others as it is essentially reviving an uncompetitive, polluting industry (dramatically increasing the intensity of the radioactivity), restarting the nuclear arms race, accelerating a plutonium economy and initiating an unending, possibly unsustainable national and international energy plan which has been legitimately shown to worsen not help climate change. Public input is warranted for such an enormous action, unprecedented since the secretive, massive Manhattan Project. Let the public help update the older information in the Draft HALEU EIS by giving us additional time. ***036-3***

REQUEST FOR 90 DAY EXTENSION OF PUBLIC COMMENT PERIOD

We ask that the comment period for the DOE/EIS–0559 *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-* ***036-1 (cont'd)***

036-1 The formal comment period started March 8, 2024, and continued until April 22, 2024, which was a 45-day comment period. DOE-NE began accepting comments with the publication of the DOE Notice of Availability (NOA) on February 29, 2024, more than a week prior to EPA's publication of the NOA and accepted comments submitted past the end of the comment period to the extent practicable. While NE understands time is needed to meaningfully review the Proposed Action activities, previous practices have proved that 45-days is generally sufficient to receive stakeholder input. Therefore, DOE did not feel a formal comment period extension was warranted. Please reference the response provided in Section 2.7, "NEPA Process," for further discussions about comment extensions.

036-2 Thank you for your comment. As shown in Table 2.6-1 of the EIS, which summarizes the potential impacts of the Proposed Action for each activity, DOE anticipates most of the impacts from implementation as small to moderate. Impacts information on each of the 16 resources analyzed under the Proposed Action plus transportation and post-Proposed Action activities (fuel fabrication, reactor operations, and spent nuclear fuel management) is presented in the text following the table as well as Chapter 3, Affected Environment and Environmental Consequences, and/or Appendix A, Environmental Consequences Supporting Information. Please also see Sections 3.1 and A-1 for impacts of mining and milling. Each of the major activities is included in Appendix A. Please also refer to the Technical Report (Leidos, 2023) for additional information regarding impacts and impact characterization.

036-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Section 2.2, "Purpose and Need," of this CRD for a discussion of this topic and DOE's response.

Irradiated (spent) HALEU fuel would not be significantly more radioactive than "normal" commercial LEU fuel and could be managed in the same facilities (see https://fuelcycleoptions.inl.gov/SiteAssets/SitePages/Home/182926.pdf). Uranium-235 is the fissile material in HALEU.

There is no plutonium in unirradiated HALEU and irradiated HALEU would not contain a significant quantity of fissile plutonium (see https://fuelcycleoptions.inl.gov/SiteAssets/SitePages/Home/182926.pdf).

Commenter No. 36 (cont'd): Diane D'Arrigo, Nuclear Information and Resource Service

Enriched Uranium (HALEU) be extended for 90 days. Extending this public comment period will enable increased public respect for the DOE process and perceptions of fairness by enabling more participation at a more meaningful level. It will allow greater inclusivity and participation, especially among those less connected and politically empowered. Finally, it will result in a more thorough, scientifically accurate and objective final statement if the additional perspectives and information that will result from an extension are permitted and fully considered.

JUSTIFICATION FOR REQUEST FOR EXTENSION

Potentially affected communities and concerned organizations need to be informed and have an opportunity to review and respond to the possibility of new, re-opened or expanded nuclear fuel chain facilities. The current forty-five day time frame is not sufficient to learn about and review such a complex issue and extensive Environmental Impact Statement.

More time is needed for those potentially affected to become aware of and meaningfully review of the Draft HALEU EIS and the direction that massive tax-payer funding of HALEU will take their towns and the nation.

036-1 (cont'd)

The Draft HALEU EIS uses existing environmental reviews for many of the fuel-"cycle" (chain) facilities and concludes that the difference in impacts would not be significant for this much higher enriched/concentrated fuel. But it does not acknowledge the contamination and struggles in those communities. People who have been part of the existing fuel chain should be afforded additional time to report to DOE on how they have been affected. DOE must review the technical information available on the existing impacts, for example, the plutonium contamination that resulted in closure of a school in Ohio.

036-4

Congress directed DOE to do an EIS on HALEU. It is incumbent on DOE to fully assess the impact that this fuel and the reactors (whose designs are yet to be technically completed, licensed, and built)will have on environment and the global nuclear arms race and proliferation.

036-5

Since the Draft HALEU EIS is relying on older environmental assessments and reports that must be updated for the current understanding of climate change on water, wind, other forces that impact nuclear reactors, additional comment time will allow for the provision of updated information. Further, it will provide a chance for communities that have experienced impacts from the existing facilities that were not included in the Draft HALEU EIS to inform the process and analysis.

036-1 (cont'd)

INTERNATIONAL NUCLEAR PROLIFERATION

Because of the inherently international nature of the nuclear fuel chain and current push to export nuclear technology, the dangers of proliferation of weapons grade nuclear material requires greater technical review and political review by arms control experts. HALEU fuel is at the edge or actually in the range of atomic weapons grade (equal to or greater than 20 % Uranium-235).

It is incumbent on DOE as part of your federally mandated HALEU planning, to assess and report back to Congress on the potential proliferation dangers of this technology. Extending the

036-6

DOE is not aware of any authoritative studies that connect a HALEU or LEU fuel cycle with accelerated climate change. In contrast, there are numerous studies showing the benefits of nuclear energy on reducing greenhouse gas emissions and their impacts on climate change (see https://world-nuclear.org/nuclear-essentials/how-can-nuclear-combat-climate-change#:~:text=Nuclear%20power%20plants%20produce%20no,electricity%20when%20compared%20with%20solar and https://www.iaea.org/bulletin/what-is-the-clean-energy-transition-and-how-does-nuclear-power-fit-in).

As described in Section 2.6.2 of the HALEU EIS, the full-lifecycle GHG emissions of coal and natural gas-power generation sources are substantially higher than for nuclear power. For instance, coal generates 820 grams (g) of carbon dioxide equivalent (CO_2e) per kilowatt-hour (g CO_2e/kWh) of electricity, while natural gas produces 490 g CO_2e/kWh. Even hydroelectric and solar produce lifecycle emissions at 24 g CO_2e/kWh and 41 g CO_2e/kWh, respectively. In contrast, nuclear power produces 12 g CO_2e/kWh (Schlömer et al., 2014). Therefore, using coal or natural gas (and even hydroelectric and solar) to generate electricity would result in higher GHG emissions. Also as described in Section 2.7.1.3 of the HALEU EIS, emissions from the Proposed Action (construction and operations of facilities and inter-site transportation) and related activities would occur over a period of up to 10 years (except up to 60 years for advanced reactors operations with the use of HALEU fuel) and could add between 770,000 to 2.45 million MT of CO_2e to global GHG emissions. Offsetting the CO_2e emissions from the Proposed Action and related activities would be the expected reduction of CO_2e emissions if the power produced were from reactors fueled by the up to 290 MT of HALEU instead of power produced by existing electrical power generation sources within regions across the United States. The total electrical power that could be generated by advanced reactors with the use of HALEU fuel produced under the Proposed Action is estimated to be roughly between roughly 44 and 64 gigawatt-years (electricity), or between 385,000,000 and 569,000,000 megawatt-hours (MW-h). Total CO_2e emitted from the generation of roughly 385,000,000 MW-h by existing electrical power generation sources could range from a low of 42,4 million MT to a high of 288.8 million MT, and from the generation of 569,000,000 MW-h could range from 61.7 million MT to a high of 420 million MT depending upon the mix of current generation capabilities assumed. These estimates reveal that electrical power generated by HALEU-fueled ANRs would result in 94% to greater than 99% lower CO_2e emissions, compared to power generated from the combination of existing non-nuclear sources. Regarding proliferation, please see Section 2.3, "Nonproliferation and Terrorism," of this CRD for further information.

Commenter No. 36 (cont'd): Diane D'Arrigo, Nuclear Information and Resource Service

comment period will enable more expert and public input on this vital aspect of HALEU, which is more complex than the current nuclear fuel chain ("cycle").

036-6 (cont'd)

GLITCH IN EXISTING COMMENT PERIOD

On a practical level, the public comment period should be extended because it is currently listed as closed on **regulations.gov**, a commonly used site to comment on federal agency/department proposals. As of the date of this request, the regulations.gov website indicates that the comment period ended on March 8, 2024 and it is not providing the usual link to comment that is normally does for open comment periods. Members of the public interested in commenting on proposals are being inadvertently misinformed as to the availability of the opportunity to comment. This reduces the amount of public comment, not just by the number of days the site is misreporting that the comment period is over, but it has a dampening effect on the possibility of spreading the word that public input is being sought.

036-7

Thank you for consideration of this extension request.

Sincerely,

Diane D'Arrigo
Nuclear Information and Resource Service
[redacted]

Terry Lodge, Esq.
Patricia Marida
Ohio Nuclear Free Network
[redacted]

Kevin Kamps
Beyond Nuclear
[redacted]

Michael Keegan
Coalition for A Nuclear Free Great Lakes
[redacted]

Alice Hirt
Don't Waste Michigan

Karen Hadden
Sustainable Energy and Economic Development Coalition (SEED)
[redacted]

Sarah Fields
Uranium Watch
[redacted]

036-4 Existing NEPA evaluations were utilized in total to provide a representative range of potential environmental consequences using the best available information. Existing sites likely have legacy characteristics that are not reflective of future construction and/or operational related potential environmental consequences. Decisions regarding site-specific location of facilities are not being made in this EIS. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). With no specific sites identified, analyses were high level and not site-specific; however, DOE did its best under the circumstances to provide timely opportunities for members of the public to share information and concerns, fully considered the public input, sought out and encouraged public involvement, and provided assistance, tools, and resources to assist public participation. DOE expects further outreach would be conducted as a part of any site-specific NEPA analysis. Please see Section 1.3.1 of the EIS for additional information on DOE's public outreach.

036-5 In the Energy Act of 2020, Congress directed DOE to establish and carry out a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. In the Act, Congress did not direct DOE to undertake an EIS, but the Department has prepared one. While fuel fabrication and reactor technologies are not specifically a part of the Proposed Action, the impacts from these reasonably foreseeable actions are acknowledged and addressed to the extent practicable in Section 3.7 of the Final EIS. Many of the specifics associated with these activities are unknown. For example, the fuel requirements for advanced reactors would be dependent not only upon which reactor designs are ultimately licensed and operated, but also to what extent the commercial operation of advanced reactors is successful. This in turn impacts both the type and number of fuel fabrication facilities needed and the ultimate disposal of HALEU fuel. A detailed assessment of the impacts of these potential future activities would be speculative and is not included in this EIS. A nonproliferation section is included in Section 3.9 Nonproliferation and Terrorism Concerns of Volume 1 in the Final HALEU EIS. Please see Section 2.3, "Nonproliferation and Terrorism," of the CRD for further information.

036-6 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE assesses that adequate structures are in place to manage the

Commenter No. 36 (cont'd): Diane D'Arrigo, Nuclear Information and Resource Service

evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

036-7 Please reference the response provided in Section 2.7, "NEPA Process," for discussions about comment extensions.

Commenter No. 37: Andrea Shipley

From: Andrea Shipley
To: HALEU-EIS
Subject: [EXTERNAL] Comments on HALEU-EIS
Date: Wednesday, April 17, 2024 3:53:53 PM

To Whom It May Concern:
I am a fourth generation Wyomingite and I am concerned about using taxpayer money to subsidize the nuclear fuel cycle for a variety of reasons. Most importantly, the DOE must consider safety, waste management, global security, and better fostering of federal funds in its decision-making process. *037-1*

First, I believe the DOE must disclose the amount of taxpayer money they plan to spend on this project so the public is award of how much (cradle to grave) it costs to subsidize the nuclear fuel cycle. From transportation, infrastructure creation, security to the inevitable waste produced, each part of the cycle should be accounted for. *037-2* *037-3, 4* *037-1 (cont'd)* *037-1 (cont'd)*

Given that this project represents a new way to deliver nuclear power to the grid. As such, the DOE's analysis must be conservative in its spending and its estimate need for HALEU. These are speculative nuclear power plants and may never get built, leaving the taxpayers holding the receipt on something that never got delivered. *037-5*

For decades, nuclear energy has been so risky that even Wall Street will not back it, triggering the need for federal subsidies to should the risks and costs of nuclear power plants. Traditionally, in a free market economy, if an idea is ready for prime time, investors and the market will back it, not the government. *037-1 (cont'd)*

Instead, I believe the DOE should consider the full opportunity cost of spending taxpayer dollars on HALEU as opposed to other projects DOE could be supporting, such as renewable energy research & development - projects that would be able to be deployed in a short time frame to be an effective solution to climate change. In contrast, new nuclear power plants take years - or decades - to design and build, and they won't come online fast enough to address climate change or other environmental issues related to energy production. *037-6*

Scientists worldwide are considering ways to reduce carbon emissions in the most efficient ways possible. The full life-cycle of nuclear energy is not often taken into account when looking at it as a potential solution to climate change. From transport to mining, enrichment to transport, waste to safe transport of waste, there is a carbon footprint to account for and a legacy of waste for which there is no current solution. This project is placing the cart before the horse. Until there is some semblance of global security, a market that backs nuclear energy and a solution to its waste, this project is premature. *037-7* *037-3, 4 (cont'd)* *037-1,3 (cont'd)*

The impacts on the community in Kemmerer will be overwhelming as well. This is a small community in a very isolated area. The community will have to address light pollution concerns, increased traffic on roadways and dirt roads, new schools and childcare facilities, hospitals, fire and emergency services, and the need for affordable housing. These are major impacts to the environment and its people, not to mention the animals in the area. *037-8*

While gearing up to create a nuclear fuel chain to accompany these plants, we must consider that the world is teetering on the verge of war. Already Russia and Iran are threatening nuclear attacks. The fuel enriched for the HALEU project is not enriched to weapons grade, but it takes much less energy *037-4 (cont'd)*

037-1 DOE acknowledges your concern regarding the cost of the HALEU program. DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

037-2 The HALEU EIS evaluates the impacts from nuclear fuel cycle facilities that would be required for HALEU fuel commercialization and the impacts from reasonably foreseeable activities related to using HALEU. The comprehensive evaluation of impacts allows DOE to make informed decisions related to the Proposed Action. Many requirements exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. As part of the licensing process for nuclear facilities, a comprehensive set of accident sequences and the likelihood and consequences of these accidents would be analyzed to assure safety of the public and workers. Advanced nuclear reactors would be designed to include features that make the reactors passively safe and prevent or mitigate the consequences of accidents considered by the reactor designers.

037-3 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Mining and milling operations have, in particular, resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD. Further, the uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no mining/milling wastes with unique characteristics. All mining/milling wastes have a path to disposal. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield

Commenter No. 37 (cont'd): Andrea Shipley

and resources to enrich uranium to weapons grade once the technology and facility is created to do the enrichment for energy. This should be a major concern of the project. *037-4 (cont'd)*

For all these reasons, I believe the DOE should take a very slow and systematic approach to launching this new technology. The proposed number of subsidies, the timeline and the overall plan for global safety must be outlined completely for the public as well as a plan for waste management and storage. *037-9*

Thank you for your time and consideration,
Andrea Shipley
[redacted]

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or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See Section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

037-4 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

037-5 The Proposed Action was developed in part based on its understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a domestic HALEU fuel cycle. As stated in the Purpose and Need (Section 1.1 of the HALEU EIS), "There is currently insufficient private incentive to invest in commercial HALEU production due to the current market base. There is also insufficient incentive to invest in commercial deployment of advanced reactors because the domestic HALEU fuel cycle does not exist. […] DOE action is needed to facilitate the development of the necessary infrastructure, to support near-term research and demonstration needs, and to support the U.S. commercial nuclear industry." Implementing the Proposed Action would facilitate the development of a commercial enrichment capability. This capability is deemed essential to the development, construction, and operation of advanced reactors and to reduce the speculative nature of future reactor development. Please also see Section 2.2, "Purpose and Need," of the CRD for further information.

Commenter No. 37 (cont'd): Andrea Shipley

037-6 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Further, agency action is needed to create a supply of HALEU fuel to power advanced reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD), as those power systems would not facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU.

It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. In the EIS, DOE identifies projected demand for HALEU through 2050, and also notes that many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. Nuclear power could contribute to the reduction in carbon emissions even under the potential timeline noted by the commenter. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

037-7 Thank you for your comment. Section 4.3.2 of the HALEU EIS provides an estimate of GHG emissions (carbon footprint) that could occur from the cumulative Proposed Action activities and the post-Proposed Action activities of reactor operations and fuel fabrication. Further, a new detailed section on GHG emissions calculations, including Tables A-12 through A-15, has been added to the Final EIS as Volume 2, Section A.8.

037-8 Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). With no specific sites identified, analyses were high level and not site-specific. This EIS is not selecting locations or processes/technologies that may be employed by the commercial suppliers.

Commenter No. 37 (cont'd): Andrea Shipley

037-9 DOE acknowledges your desire for a slow and systematic approach to implementation of the HALEU technology. However, in the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. While HALEU has a newer enrichment range, most of the technologies used to reach HALEU have previously existed for LEU and LEU+ processes. Similarly, DOE does not expect HALEU wastes to have unique characteristics in comparison to existing nuclear wastes. Please see Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for more information on that topic.

Commenter No. 38: Kalene Walker

From: Kale Walker
To: HALEU-EIS
Subject: [EXTERNAL] HALEU DEIS - request extension of public comment period
Date: Wednesday, April 17, 2024 7:58:22 PM

Mr. James Lovejoy,
HALEU EIS Document Manager

Please add my voice to those who are requesting a time extension for the public comment period on the HALEU draft EIS.
The DEIS claims to have evaluated projected environmental impacts from the various complex phases of the nuclear fuel chain. But the document fails to include the historical record, the facts and data of actual environmental impacts (harm) from the very processes being considered.
To adequately respond to the draft, members of the public feel compelled to research and compile our own findings - which we had expected to find in the DEIS.
This of course, is a huge effort, and deserves more than the time presently allotted for public comments.

Also, please consider that at many public meetings, DOE presenters have acknowledged the lack of public trust in the DOE - and the need to restore it. Extending this public comment period could be a gesture toward that goal.

Thank you for your consideration,
Kalene Walker

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038-2

038-1 (cont'd)

038-1 Please reference the response provided in Section 2.7, "NEPA Process," for discussions about comment extensions.

038-2 The EIS uses the latest NEPA impact data for all potential sites, and surrogates for others, to allow subject matter experts (SMEs) to predict the potential impacts from the use of the resource for production of HALEU. The Technical Report (Leidos, 2023) prepared by DOE in support of the EIS considers the evaluation of impacts through the incorporation by reference of past NEPA documentation. The EIS did not consider site-specific long term monitoring reports at existing facilities to document baseline conditions or provide site specific affected environment descriptions for the Proposed Action because decisions on specific locations of facilities are not being made in this EIS. However, the Technical Report does consider in the evaluation of impacts that certain levels of resource impacts have occurred as part of construction or is on going within existing facility operations. Since decisions on specific location of facilities are not being made in this EIS, providing affected environment information in the body of the EIS or appendices was determined as unreasonable and would not provide concise and informative information to the potential impact analysis, and thus is included or referenced in the Technical Report only.

Regarding the historical record, the projected impacts of new operations will likely reflect current environmental, safety and regulatory practices and not practices from decades ago. Historical construction and operational information, while available, reflects impacts from mid-20th century operations. There has been significant evolution of practices, regulations, oversight, and reporting, such that this historical information is not representative of future potential environmental consequences, andwas not relied on in predicting the potential environmental consequences associated with the Proposed Actions. Ongoing activities at existing facilities (also see Figure 1-3 of the Technical Report) and construction and operation of new facilities are, and would be, under the cognizant regulatory agencies NEPA evaluations and associated license and permitting conditions. Section 1.1.2, "Description of the Process," of the Technical Report does provide information on estimated footprint requirements and activities associated with mining and milling activities used by SMEs, along with the previous NEPA documentation, to characterize the potential range of impacts. The Final EIS has been updated to include specific links to the appropriate section of the Technical Report (Leidos, 2023) so as to provide more detailed analyses of the bases for the conclusions.

Commenter No. 39: Patty Schlesinger

From: patty schlesinger
To: HALEU-EIS
Subject: [EXTERNAL]
Date: Thursday, April 18, 2024 8:30:29 PM

Please support the No Action Alternative re. the 40 year plus Cotter contamination site.
Patty Schlesinger, Fremont Co., resident for 35 years.
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039-1, 2

039-1 DOE acknowledges your support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

039-2 DOE acknowledges your concerns about the Cotter/Lincoln Park Superfund Site which was previously operated as a uranium processing facility. In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Mining and milling operations have, in particular, resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. However, previously contaminated sites are not in the scope of the Proposed Action and therefore are not evaluated in this EIS. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD. The uranium ore mined and processed to produce the HALEU under the Proposed Action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. Waste quantities generated would represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 40: Kathy Madonna

From: Kathy Madonna
To: HALEU-EIS
Subject: [EXTERNAL] Environmental Impact Statement (EIS) for High-Assay Low-Enriched Uranium (HALEU) Availability Program Activities in Support of Commercial Production of HALEU Fuel.
Date: Friday, April 19, 2024 12:46:02 PM

- My community is an "**entity involved in the nuclear fuel cycle"** and has been since the late 1950's.
- As such we have lived with the contamination of the front end of the nuclear fuel cycle every day, because it is still not cleaned up even after 40 years as a radioactive Superfund Site.
- We bear witness of the contamination from that history, and don't want our nation to make this same mistake again. This proposed DOE creation of a new way to support the nuclear industry is ill-advised and blind to what history shows us will happen.
- The partnership between DOE and the nuclear industry companies in DOE's own words is intended to create ***"a commercial HALEU-based reactor economy".*** This is extremely disturbing. I will not support an endeavor that leaves communities at high risk of becoming collateral damage without demanding to be heard.
- The National Environmental Policy Act (NEPA) was signed into law on January 1, 1970. It requires DOE to assess the environmental effects of their proposed actions prior to making decisions.
- For these reasons, I appeal to the DOE to choose the No Action Alternative and DO NOT Support the creation of demand and price guarantee of HALEU.

040-1

040-2

040-1 DOE acknowledges your concerns about your community and past contamination. In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Mining and milling operations have, in particular, resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. However, previously contaminated sites are not in the scope of the Proposed Action and therefore are not evaluated in this EIS. For additional information see Section 2.4, "Legacy Issues," of this CRD. The uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no mining/milling wastes with unique characteristics. All mining/milling wastes have a path to disposal. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See section 2.6.1.10.

040-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

Commenter No. 40 (cont'd): Kathy Madonna

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Kathy A. Madonna

[redacted]

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Commenter No. 41: Travis Deti, Wyoming Mining Association

From: Travis Deti
To: HALEU-EIS
Cc: Oscar Paulson; Katie Sweeney
Subject: [EXTERNAL] WMA Comments on DOE HALEU Environmental Impact Statement
Date: Friday, April 19, 2024 10:51:42 AM
Attachments: WMA_DOE RE HALEU EIS.pdf

To whom it may concern:

Attached please find comments of the Wyoming Mining Association regarding the Department of Energy's (DOE) Draft Environmental Impact Statement for DOE Activities in Support of Commercial Production of High Assay Low-Enriched Uranium (HALEU).

Thank you for your kind attention.

Best regards,

Travis Deti
Executive Director
Wyoming Mining Association
307-635-0331
www.wyomingmining.org

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Commenter No. 41 (cont'd): Travis Deti, Wyoming Mining Association

WYOMING MINING ASSOCIATION
1401 Airport Parkway, Ste. 230 - Cheyenne, WY 82001 - (307)-635-0331

April 19, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue
MS 1235
Idaho Falls, Idaho 83415

RE: Wyoming Mining Association (WMA) Comments on the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) - Notice of Availability in Federal Register/Volume 89, Number 46/Thursday, March 7, 2024/Notices

Dear Mr. Lovejoy:

The Wyoming Mining Association (WMA) is an industry trade association representing mining companies, contractors, vendors, suppliers and consultants in the State of Wyoming. Among its mining industry members are uranium recovery licensees, including conventional and in-situ uranium recovery operators, companies planning new uranium recovery operations, companies conducting final reclamation/groundwater restoration operations, and TerraPower which is planning to construct a Natrium™ reactor near Kemmerer, Wyoming. Wyoming accounts for between 30 and 40 percent of the total uranium concentrate production in the United States.

Given the involvement of some of the Association's members in the uranium recovery industry, and the fact that TerraPower is also a member, WMA submits the following comments on the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU).

General Comments

- The document includes uranium mining and milling within its scope. In Volume 1 the document states:
  - *"Existing NEPA documentation for uranium fuel cycle activities and facilities where those activities have historically taken place was carefully examined to estimate the potential impacts of each of the activities associated with the Proposed Action."* and;
  - *Extensive NEPA evaluation documentation exists for environmental consequences of activities similar to those of the Proposed Action"*
- The Association agrees with the approach of carefully examining the abundant available documentation, agrees that abundant such documentation exists and believes that the abundant existing documentation precludes the need for any additional studies.
- The WMA agrees with the discussion in the Summary in S.7.1.1 entitled *Uranium Mining And Milling*. It is succinct and to the point.
- The document in Volume 1 states in S.2.6.1.18 – *Proposed Action - Effects Associated with Use of Foreign Fuel Cycle Facilities*:

041-1

041-1 DOE acknowledges your support for the analysis. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 41 (cont'd): Travis Deti, Wyoming Mining Association

- *Similarly, a complete reliance of foreign UF6 (eliminating both domestic mining and milling and domestic conversion) would eliminate any domestic environmental impacts associated with these activities.*
- While there may not be any physical domestic environmental impact associated with complete reliance on foreign UF6, there are other severe consequences that should preclude dependence on foreign sources for nuclear fuel. The WMA disagrees with the notion that the U.S. should have complete reliance on uranium, conversion, UF6 and or enrichment services from foreign sources. To do so disregards the impacts to the local and state economic environment, specifically lost tax revenues from uranium recovery and lost employment opportunities. There is also an issue of National Security and a requirement for domestic unobligated uranium use in U.S. defense applications. The United States needs a viable and robust domestic nuclear fuel supply industry for international leadership in the nuclear field as well domestic supply needs. The document in Table 2.6- 1 Summary of Impacts, describes impacts from uranium mining and milling as small with larger (moderate to large) impacts for resource areas at specific mines possible, moderate. The impacts to rural areas of these activities **not being conducted** (emphasis added) would be large in terms of lost tax revenues and lost jobs created by a 100 percent reliance on foreign produced uranium.

041-2

- In reviewing the references for the document, the following references related to uranium recovery appear:
  - *Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities, NUREG-1910* .
  - Uranium Mining and Milling. Lawrence Livermore National Laboratory. (Livermore, Ca. (2018).
  - Final Generic Environmental Impact Statement on Uranium Milling Project M-25, NUREG-0706.
  - Environmental Impact Statement for the Moore Ranch ISR Project in Campbell County, Wyoming: Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities — Final Report, NUREG-1910, Supplement 1.
  - Fact Sheet on Uranium Recovery. Retrieved from U.S. Nuclear Regulatory Commission.
  - Uranium Recovery. Retrieved from U.S. Nuclear Regulatory Commission.
  - Draft Environmental Impact Statement for Roca Honda Mine Sections 9, 10 and 16, Township 13 North, Range 8 West, New Mexico Principal Meridian, Cibola National Forest, McKinley and Cibola Counties, New Mexico.
  - Environmental Assessment for Renewal of Source Material License No. SUA-1358, White Mesa Uranium Mill. U.S. Nuclear Regulatory Commission.
  - Final Environmental Impact Statement to Construct and Operate the Crownpoint Uranium Solution Mining Project, Crownpoint, New Mexico, NUREG–1508.
  - Environmental Impact Statement for the Lost Creek ISR Project in Sweetwater County, Wyoming: Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities — Final Report, NUREG-1910, Supplement 3.
  - Environmental Impact Statement for the Nichols Ranch ISR Project in Campbell and Johnson Counties, Wyoming: Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities — Final Report, NUREG-1910, Supplement 2.

www.wyomingmining.org

041-2 DOE acknowledges your concern regarding reliance on foreign sources of uranium. Section 1.0.3, Where Do We Get Uranium for Reactor Fuel Now? of the HALEU EIS, describes the current uranium supply chain. Section 1.0.4, How Will We Get What We Need, describes options for obtaining uranium for HALEU. In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. As described in Section 2.1.1, Uranium Mining and Milling, to encourage the use of a domestic supply of uranium in support of the commercialization of the HALEU fuel cycle, DOE's Enrichment Request for Proposals (RFP) identified domestic supplies of uranium as the preferred source, and North American supplies as the next preferred source, although other foreign sources (allied or partner nations) could be utilized. The Enrichment RFP also identified existing mining capacity as preferred. In addition, please refer to Section 2.1, "Support and Opposition," and Section 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's responses. The socioeconomic impacts of uranium mining and milling are described in Appendix A, Section A.1.3.10, and summarized in Section 3.1.10.

Commenter No. 41 (cont'd): Travis Deti, Wyoming Mining Association

- Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities — Final Report, NUREG-1910, Supplement 4.
- Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming: Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities: Final Report, NUREG-1910, Supplement 5.
- Environmental Impact Statement for the Reno Creek In Situ Recovery Project in Campbell County, Wyoming: Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities, Final Report, NUREG-1910 Supplement 6.
- Draft Environmental Impact Statement for the La Jara Mesa Mine Project. U.S. Department of Agriculture.
- Final Environmental Statement related to operation of White Mesa Uranium Project, Energy Fuels Nuclear Inc., NUREG-0556.
- Final Environmental Assessment for the Ludeman Satellite In Situ Recovery Project, Converse County, Wyoming. U.S. Nuclear Regulatory Commission Office of Nuclear Material Safety and Safeguards, Division of Fuel Cycle Safety, Safeguards, and Environmental Review.

Based on the references, it appears that a thorough review pertaining to uranium recovery was completed. The document uses high quality thorough references such as the *Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities, NUREG-1910* and its associated supplements.

- The documents discuss laser enrichment. The Summary states:
  - *Separately, GE-Hitachi had planned a laser enrichment facility for its complex in Wilmington, North Carolina, which would have been a first-of-a-kind facility for the United States. In this enrichment process, laser-emitted light is selectively absorbed by U-235 and not U-238. The absorbed energy ionizes (removes an electron from) the U-235, allowing it to be separated from the non-ionized U-238. As with centrifuge enrichment, a single laser does not enrich the uranium to product levels (both LEU and HALEU) in a single step, and the lasers are arranged in cascades to generate the desired enrichment at production-level quantities. A license was granted by the NRC in 2009, but the facility was not constructed and this license has been terminated.*
  - Volume 2 Appendices includes the following table:

Table B-7. Uranium Enrichment – Global Laser Enrichment (GLE) SILEX, Wilmington, North Carolina; Paducah, Kentucky

Activity	*Document #*	*Title*	*Link*
		SILEX Systems Limited, Global Laser Enrichment Facility	https://www.nrc.gov/materials/fuel-cycle-fac/laser.html
	(NRC, 2012b), NUREG-1938	Environmental Impact Statement for the Proposed GE-Hitachi Global Laser Enrichment, LLC Facility in Wilmington, North Carolina	https://www.nrc.gov/docs/ML1204/ML12047A040.pdf
GLE – Production-Scale HALEU Enrichment (19.75%)	**Analysis of NEPA Documentation: Proposed** – GLE Test Loop commissioned in Wilmington in 2009; operational for over 10 years. Operations of the Test Loop are on hold. A full-scale facility was licensed in September 2012, but at present it is not being built due to market conditions. NEPA documentation covers GLE operations in Wilmington, North Carolina. The facility would operate at 3–6 million SWU[22] capacity, deployed in 1 to 1.5 million SWU halls. The facility at Wilmington could be modified to produce HALEU.		

Key: % = percent; GE = General Electric; GLE = Global Laser Enrichment; HALEU = high-assay low-enriched uranium; MTU = metric tons of uranium; NEPA = National Environmental Policy Act; NRC = U.S. Nuclear Regulatory Commission; SWU = separative work unit

041-3

041-3 DOE acknowledges your support for the review undertaken. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

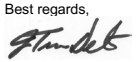
Commenter No. 41 (cont'd): Travis Deti, Wyoming Mining Association

The WMA supports laser enrichment as an environmentally preferable enrichment method due to its smaller footprint and lower energy consumption. Please see Goldsworthy, M., *The Uranium Enrichment Industry and the SILEX Process* (https://inis.iaea.org/collection/NCLCollectionStore/_Public/31/033/31033873.pdf).

The State of Wyoming is ideally suited for hosting these smaller and lower footprint enrichment facilities. The WMA requests that additional discussion be added regarding the environmental benefits of this technology.

Thank you for your kind attention. The Wyoming Mining Association appreciates the opportunity to comment on this notice. If you have any questions please do not hesitate to contact me.

Best regards,



Travis Deti
Executive Director

CC: Ms. Katie Sweeney - Executive Vice President and General Counsel - National Mining Association

www.wyomingmining.org

041-4

041-4 The HALEU EIS is not intended to support technology selection (e.g. laser enrichment vs. gas centrifuge enrichment) or site selection for the activities under and related to the Proposed Action. Those decisions are expected to be the subject of additional NEPA analysis prepared by the cognizant regulatory (Federal or state) licensing authority.

Commenter No. 42: Patrick Mills, Confederated Tribes of the Umatilla Indian Reservation

From: Patrick Mills
To: HALEU-EIS
Cc: Mason K. Murphy
Subject: [EXTERNAL] CTUIR comments on draft HALEU EIS
Date: Friday, April 19, 2024 5:47:23 PM
Attachments: CTUIR Comments to USDOE HALEU DEIS SIGNED.pdf

Hello, please see attached comments on the draft HALEU EIS.

Kind regards,

Patrick Mills, PMP, EIT
Climate Coordination Analyst
CTUIR Office of the Executive Director
46411 Timine Way
Pendleton, OR 97801
Office: (541) 429-7367

Response side of this page intentionally left blank.

Commenter No. 42 (cont'd): Patrick Mills, Confederated Tribes of the Umatilla Indian Reservation

Confederated Tribes of the
Umatilla Indian Reservation

Board of Trustees & General Council

46411 Timíne Way
Pendleton, OR 97801
www.ctuir.org email: info@ctuir.org
Phone 541-276-3165 Fax: 541-276-3095

April 12, 2024

Submitted electronically via email

U.S. Department of Energy
Office of Nuclear Energy
Email: HALEU-EIS@nuclear.energy.gov

RE: Confederated Tribes of the Umatilla Indian Reservation Comments to USDOE HALEU DEIS

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) takes our treaty rights protection and the federal government's Trust Responsibility very seriously. We are asking you to consider the extensive impacts that developing a domestic HALEU supply chain would have. **042-1**

The CTUIR is committed to reducing reliance on fossil fuels, has a strategic energy plan to guide actions on the Umatilla Indian Reservation, and has adopted the Columbia River Inter-Tribal Fish Commission's (CRITFC) Energy Vision for the Columbia Basin to guide policy throughout our usual and accustomed areas. These guiding documents offer solutions for an energy future that protects and enhances environmental quality, improves resiliency for both customers and the environment, and mitigates climate change impacts. **042-2**

Recommendation 42 of the CRITFC Energy Vision states: **042-1 (cont'd)**

> *'Northwest utilities* ***should not consider new nuclear power missions at the Hanford Nuclear Reservation without tribal consultation and consent.*** *Evaluation of other sites for nuclear fission should consider the costs and compatibility with intermittent renewable resources and salmon protections.'* **042-2 (cont'd)**

The CTUIR does **NOT** support the deployment of Small Modular Nuclear Reactors (SMNR) or any new/additive nuclear missions until there is a national repository for permanent disposal of spent nuclear fuels. **042-3**

The potential impacts of the project are enormous. In 1855, predecessors to the CTUIR- our ancestors of the Cayuse, Umatilla, and Walla Walla Tribes and bands of Indians-negotiated and signed our Treaty with the United States. The Treaty is a contract between sovereigns and is "the supreme Law of the Land" under Article VI of the United States Constitution. In this Treaty, the CTUIR ceded millions of acres of land to the federal government, and in exchange, received assurances that various pre-existing tribal rights would be protected, and our interests would be respected, in perpetuity. **042-1 (cont'd)**

A paramount objective in the Treaty negotiations was protecting and maintaining our tribal culture, traditions, way of life, and First Foods-water, fish, big game, roots, berries, and other plants, and, critically, *access to them* and the habitats and ecosystems that support and sustain them, then, now, and forever. This is a duty the United States undertook in the form of the Trust Responsibility to honor the obligations of the Treaty. This objective-protecting, maintaining, and perpetuating our culture-remains paramount for the CTUIR. We have worked for decades with the U.S. Department of Energy to ensure the laws enacted and enforced protect not only our rights under the Treaty of 1855, but also the invaluable sites and resources left by our ancestors for our descendants. Rights reserved by the CTUIR in the Treaty of 1855, 12 Stat. 945, remain attached to lands that would be negatively impacted by domestic uranium mining **042-2 (cont'd)** **042-1 (cont'd)**

042-1 The Department of Energy (DOE) takes our commitment to strengthening Tribal sovereignty and self-governance seriously, and we know that fulfilling Federal trust and treaty responsibilities to Tribal Nations along with robust and meaningful consultations are the cornerstones of Federal Indian policy. However, as stated in the HALEU EIS, this EIS does not propose selection of specific sites for HALEU fuel cycle facilities. As stated in Section 1.6 of the HALEU EIS, "This EIS provides information to support a decision regarding whether to (1) Facilitate the establishment of commercial HALEU fuel production capability and (2) Acquire (through HALEU as enriched uranium hexafluoride and deconversion services) from commercial sources, up to 290 metric tons (MT) of HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance." As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that the subsequent analyses would include assessments of specific locations, and at that time DOE expects the regulatory authority would provide formal consultation opportunities with the potentially affected Tribes during the follow on NEPA or equivalent environmental review process. DOE remains available for government-to-government consultation to discuss your concerns on the HALEU EIS, but at this time does not know if the Confederated Tribe of the Umatilla Indian Reservation or lands with tribal trust responsibilities would be affected.

042-2 As stated in the EIS, one of the aspects of a clean energy future is sustainment and expanded development of safe and affordable nuclear power. One key element of that goal is the availability of fuel to power advanced reactors.

DOE prepared a Technical Report (Leidos, 2023) in support of the EIS. The Technical Report is divided into Chapters for each step for HALEU. Each Chapter provides information on existing NEPA documentation reviewed and a discussion on the approach to NEPA analysis for determining the potential environmental consequences using the existing NEPA documentation for the Proposed Action activities (see respective sections, such as Section 1.1.4 for Uranium Mining and Milling, Section 2.14 for Uranium Conversion, Section 3.1.4 for Uranium Enrichment, etc.). This includes defining a region of influence (ROI) for each resource area based on activity and consideration of any permitting and regulatory requirements, best management practices, and standard operating procedures that serve to minimize or avoid adverse impacts on resources. The Technical Report includes consideration of water quality, fisheries, wildlife and hunting, protected species and cultural resources. The Final EIS has been revised to include the approach and reference to

Commenter No. 42 (cont'd): Patrick Mills, Confederated Tribes of the Umatilla Indian Reservation

efforts. Several mines in usual and accustomed territory have been abandoned for years and would likely be utilized to meet the domestic supply chain for HALEU.

042-4

We anticipate the development of a domestic HALEU production may have impacts on the following resources, **and request that special emphasis be placed on the analysis of impacts to:** 1) water quality and resident and anadromous fish habitat; 2) big game habitat; 3) state and federally-listed wildlife and plants; 4) historic properties of religious and cultural significance as defined in the National Historic Preservation Act, including but not limited to visual and aural impacts; and 5) all other cultural and historical resources.

042-2 (cont'd)

This opposition is consistent with the CTUIR's adopted Hanford Policy which states:

> **Natural Resources Management**
> Hanford and Hanford-affected lands and resources should ***not be further developed and no new nuclear missions or expansion of nuclear energy, nor new or expanded nuclear fuel storage undertaken*** unless explicitly permitted by the CTUIR Board of Trustees through government-to-government consultation.

042-1 (cont'd)

Furthermore, the CTUIR's adopted Energy Policy states:

> While the environmental damage of future uranium mining and milling can be effectively limited ... ***the lack of a permanent way to store and dispose of highly radioactive spent nuclear fuel rods remains a serious barrier*** (Pages 12-13).

042-3 (cont'd)

We understand that spent nuclear fuel reprocessing and recycling is not included in the scope of this EIS. However, we would still like project proponents to share their ideas on how this may be accomplished as it relates to potential waste levels at the Hanford Site. Please contact Mason Murphy (masonmurphy@ctuir.org) with follow-up regarding this letter.

042-5

Sincerely,

Gary I. Burke, Chairman
Board of Trustees
Confederated Tribes of the Umatilla Indian Reservation

the Technical Report in the Summary and Volumes 1 and 2 in more detail to provide a reader with a better understanding and include more references to the Technical Report throughout the document.

While DOE understands and shares Tribal interests in preserving historic and cultural resources and supports the Section 106 consultation process, DOE is not considering site-specific facility or activity locations in this EIS. Therefore, the activities described in the HALEU EIS are not ripe for meaningful Section 106 consultation. DOE expects that other Federal agencies will be involved in the authorization of the HALEU activities and will have obligations to comply with applicable environmental and Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies. Regardless of this limitation, DOE continued to encourage Tribal participation and remains available for government-to-government consultations consistent with its trust responsibilities. Additional information on consultation has been added to Section 6.1 of the EIS.

042-3 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, Storage of Spent Nuclear Fuel at the Reactor, at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing

Commenter No. 42 (cont'd): Patrick Mills, Confederated Tribes of the Umatilla Indian Reservation

commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*.

Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

042-4 The EIS acknowledges that there are existing mines that could be used for the Proposed Action. The EIS used the latest NEPA impact analysis for all potential sites, and surrogates for others, to allow subject matter experts (SMEs) to predict the potential impacts, including from mining, of the use of the resource for production of HALEU related to the Proposed Action. The Technical Report (Leidos, 2023) prepared by DOE in support of the EIS considers the evaluation of impacts through the incorporation by reference of past NEPA documentation. DOE's consideration of both ISR and conventional mining included active mines, mines on standby, and mines undergoing the permitting process. Some of the facilities on standby have been so for decades but their status is not indicated as closed or permanently inactive via available data sources.

042-5 While not specifically a part of the Proposed Action, spent fuel storage and disposition are acknowledged in the EIS as a reasonably foreseeable activity that could result from implementation of the Proposed Action. Impacts related to this activity are addressed to the extent practicable in Section 3.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," in Volume 1 of the EIS. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 43: Tami Thatcher

From: Tami Thatcher
To: HALEU-EIS
Subject: [EXTERNAL] Public Comment on Draft HALEU DIS, DOE/EIS-0559
Date: Saturday, April 20, 2024 8:00:42 PM
Attachments: CommentDOEhaleu2024.pdf

Please find my attached public comment on

Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU), DOE/EIS-0559

I would appreciate acknowledgement of DOE receiving my comment submittal.

Thank you.

Tami Thatcher

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Commenter No. 43 (cont'd): Tami Thatcher

Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU), DOE/EIS-0559

Comment submittal by Tami Thatcher, April 22, 2024. (Revision 1)

Comments are due April 22, 2024 and may be sent to HALEU-EIS@nuclear.energy.gov

Summary

In March 2024, the Department of Energy issued for public comment the Draft Environmental Impact Statement (EIS) in support of commercial production of high-assay low-enriched uranium (HALEU). [1] HALEU is uranium enriched up to as high as 20 percent in uranium-235, and is generally higher enrichment than the fuel used in current light-water reactors which is below 5 percent enriched. Higher enrichment allows longer operation without refueling, but with longer operation in a reactor, more fission products are generated. The higher enrichment complicates disposal and it also creates a nuclear weapons material proliferation problem which is the concern that the material may be stolen and used in a nuclear weapon.

Because of the enormous cost and the inevitable radiological harm from increased HALEU production, I opposed DOE's Proposed Action and I urge DOE to choose the No Action Alternative, "where no sufficient domestic commercial supply of HALEU is available." ***043-1***

Far more innovation is possible in using other technologies such as storage and efficiency improvements than described in the Draft HALEU EIS for the No Action Alternative. However, time is running out and money is scarce. The DOE's advanced reactor schemes and HALEU promotion take too long and are too expensive to combat climate change. The nuclear reactor and HALEU promotion must be evaluated with consideration of how long it will take to deploy and how much it will cost, not only for construction but also for permanent disposition of the spent nuclear fuel created. ***043-2***

The Draft HALEU EIS states that "One of the aspects of a clean energy future is sustainment and expanded development of safe and affordable nuclear power." This is biased, speculative conjecture. Nuclear energy is highly radiologically polluting even without an accident. Nuclear energy, even when ignoring the cost of attempting to manage and dispose of spent nuclear fuel as the Draft HALEU EIS does and the nuclear industry does, is simply not affordable. ***043-3*** ***043-4*** ***043-5*** ***043-6***

The Draft HALEU EIS relies on other biased and inadequate EISs such as the U.S. Nuclear Regulatory Commission's 2014 Generic "Continued Storage" EIS that updated its previous "Waste Confidence" EIS by assuming that spent nuclear fuel will be repackaged before canisters fail, all without any funding source or planning. This assumption allowed the NRC's "Continued Storage" of spent nuclear fuel EIS to side step conducting economic and national security ***043-3 (cont'd)***

[1] U.S. Department of Energy, *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)*, DOE/EIS-0559, March 2024. https://www.energy.gov/ne/haleu-environmental-impact-statement Public comment is open until April 22, 2024 and comments may be sent to HALEU-EIS@nuclear.energy.gov

043-1 DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information. DOE acknowledges your concern regarding the cost of the HALEU program. Please see information on costs in Section 2.8, "Out of Scope," of this CRD. Related to potential radiological impacts, please see Section 2.6.1 of the HALEU EIS, Section 3.1.8 of the HALEU EIS, and subsections X.3.11 and X.3.12 (depending on the activity, [e.g., Section 1.3.11. for mining and milling impacts]) of the Technical Report (Leidos, 2023). Each of these sections estimate that the human health impacts from HALEU production would be SMALL except for potentially MODERATE impacts in mining and milling accident scenarios.

043-2 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (see Section 2.2, "Purpose and Need" of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Even with the timeline the commenter identified, nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

Commenter No. 43 (cont'd): Tami Thatcher

consequences, and human health and environmental consequences of failure to isolate radionuclides from spent nuclear fuel from the biosphere.

The longevity of the hazard from spent nuclear fuel is hard to fathom, and even nuclear professionals often do not realize how long the radioactive waste in spent nuclear fuel (and high-level waste from reprocessing) remains radioactive. While certain fission products like cesium-137 and strontium-90 each have a roughly 30-year radioactive half-life, and their presence is greatly diminished in 500 years, other radionuclides in spent nuclear fuel remain radioactive for thousands and over hundreds of thousands of years. The radioactive decay of some decay series actually makes the waste more radioactive over time. The waste is more mobile in the environment than it was when bound up in uranium ore. The radioactive waste remains highly radiotoxic for over a million years even though the decay heat generated at that time is far less than when the fuel was removed from a nuclear reactor.

The radioactive waste in spent nuclear fuel remains toxic and hazardous to humans and other living things for millennia. But obtaining permanent disposal for spent nuclear fuel remains more elusive today than it was 20 years ago despite decades of effort. Between 1983 and 2010, about $15 billion was spent investigating and attempting to design and license a repository at Yucca Mountain that was never built.

The Draft HALEU EIS acknowledges that the Department of Energy's program for a geologic repository for spent nuclear fuel at Yucca Mountain, Nevada, has been terminated. Empty statements are made that DOE remains committed to meeting its obligations to manage and, ultimately, dispose of spent nuclear fuel. The Yucca Mountain repository program was terminated in 2010. The DOE has continued conducting limited and generic repository research since 2010 and yet appears no closer to designing, licensing, and operating a repository.

The DOE is not admitting how many repositories it actually needs now without the new reactors DOE is promoting. The DOE is not providing a viable or affordable concept for disposing of spent nuclear fuel. The proposed advanced reactors may require much more space in a repository, due to higher enrichment and other characteristics. Honest and realistic evaluation of the increased amount of spent nuclear fuel and the increased technical challenges of the proposed varieties of spent nuclear fuel must be included in any useful EIS that meets the intent of conducting an environmental impact statement, which should be to protect humans and the environment.

The Draft HALEU EIS is claiming that storage of spent nuclear fuel is safe and yet by the DOE's own admission, there is not enough information to conclude that long term storage (greater than a few decades) of spent nuclear fuel is safe. Nor is there enough information to conclude that transportation of spent nuclear fuel can be conducted safely after long term storage.

The cost of spent nuclear fuel disposal has been estimated by the Department of Energy in 2019 as $168 billion and yet was low-balled in many ways. The DOE's existing cost estimate for only a portion of the nation's existing spent nuclear fuel does not include the cost of the increased nuclear reactors now being promoted by the Department of Energy. Many of the proposed reactors will produce spent nuclear fuel that may require disproportionately more space

043-3 (cont'd)

As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Support and funding for nuclear energy versus renewable energy technologies is outside the scope of this EIS. HALEU is defined as uranium in which the concentration of the isotope uranium-235 has been increased to over 5 weight percent but less than 20 weight percent, however the Proposed Action is specifically limited to HALEU enriched to at least 19.75 and less than 20 weight percent. This range allows for the production of HALEU fuel in enrichments suitable for advanced reactors. While there are studies to examine the potential use of lower enriched HALEU (less than 10%) in existing commercial light water reactors; that is not the intended use of the HALEU being addressed by the Proposed Action. Although the Proposed Action is limited to the facilitation of commercial HALEU fuel production and the procurement of a limited amount of HALEU, the EIS does recognize that the HALEU would ultimately be used in advanced reactors. Therefore, to the extent possible the HALEU EIS does address reasonably foreseeable actions, including the use of HALEU fuel in reactors.

043-3 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small

in a repository because of the higher enrichment and other characteristics. The increase in the amount of spent nuclear fuel to dispose of because of DOE's promotion of more nuclear energy must be addressed and not swept aside as it is in the Draft HALEU EIS.

Spent nuclear fuel and high-level waste disposal are the foundation of the U.S. nuclear industry's spent nuclear fuel management promises. The Department of Energy has made reference to its repository program at Yucca Mountain in many of its Environmental Impact Statements. Despite this, the Department of Energy makes no progress toward a permanent solution for the radioactive waste, the spent nuclear fuel, that is poised to contaminate air, land and water for millennia. The Department of Energy seeks endless and expensive schemes to make more waste, as the work to attempt to figure out how to confine the waste for millennia languishes. Even the work to safely confine the waste for a few decades languishes.

This Department of Energy's Draft HALEU EIS actively avoids evaluation of the complications and costs of various reactor fuels that would use HALEU feedstock. The feasibility, cost and technical difficulty are treated by DOE as non-problems until the costs and difficulties lead to years of expense and failure. There is a steadfast refusal by the Department of Energy to learn from past and ongoing mistakes. But not every problem is actually solved by changing the name of the facility, by sanitizing the facts about the contamination, by failure to monitor the contamination, or by denial of the source of the illnesses and excess deaths. See the former Portsmouth Gaseous Diffusion Plant, now renamed the American Centrifuge Plant, near Piketon, Ohio.

According to the Government Accountability Office, "Cleaning up 3 plants where uranium was enriched will cost billions of dollars and span decades. These sites – near Oak Ridge, Tennessee, Paducah, Kentucky; and Portsmouth, Ohio [actually near Piketon, Ohio] – are contaminated with radioactive and hazardous materials. [2]

The Draft HALEU EIS relies on the U.S. Nuclear Regulatory Commission's 2014 Generic EIS for "Continued Storage" of spent nuclear fuel. [3] That generic EIS uses magical thinking to avoid stating that actual environmental and human health devastation of failing to confine the radioactive spent nuclear fuel.

The NRC's 2014 generic EIS for Continued Storage of spent nuclear fuel simply assumed that Dry Transfer Facilities would be used at every location spent nuclear fuel is stored, and would repackage the spent nuclear fuel as many times as needed, and about every 100 years. In 2024, no Dry Transfer Facility has been designed. There is no cost estimate being provided for the design, construction and operation of 70 plus or so of these Dry Transfer Facilities. Each one is likely to be very costly and the electric utilities don't want to pay for it. Dry Transfer Facilities

[2] U.S. Government Accountability Office, *NUCLEAR CLEANUP Actions Needed to Improve Cleanup Efforts at DOE's Three Former Gaseous Diffusion Plants*, GAO-20-63, December 2019. https://www.gao.gov/products/gao-20-6

[3] Nuclear Regulatory Commission, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel*, U.S. Nuclear Regulatory Commission Office of Nuclear Material Safety and Safeguards, NUREG-2157, 2014.

043-3 (cont'd)

addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to siting a Federal consolidated interim storage facility and spent fuel management. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. The transportation of uranium products during the HALEU fuel cycle activities were analyzed and are expected to result in low overall human health risks, as these activities would be conducted in a safe manner based on compliance with Federal and state comprehensive regulatory requirements. Cost are not part of the EIS scope and were not evaluated. Also, please refer to Sections 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," and 2.6, "Transportation," of this CRD for a discussion of this topic and DOE's response.

043-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. DOE proposes to procure, over a 10-year period of performance, up to 290 MT of HALEU from the commercial sector - an amount that it believes will be sufficient to facilitate a domestic, commercial HALEU fuel cycle. The EIS addresses the impacts associated with the amount proposed for procurement under the Proposed Action (a maximum of 290 MT). The future need estimates reflect publicly available information and were included for transparency and background, but amounts produced beyond the 290 MT would be dependent on additional commercial undertakings (the specifics of which are highly speculative at this juncture), and therefore are not part of the Proposed Action impact analysis. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's responses.

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will be needed and will entail high radiation exposures to workers and may also involve radiological releases affecting the public.

Accidents from spent nuclear fuel storage and from failure to repackage spent nuclear fuel prior to canister breach must be included in the HALEU EIS. The U.S. Nuclear Regulatory Commission has ignored aging effects and canister corrosion that threaten the safety of spent nuclear fuel storage by arguing that the limited years of the license period are its only concern.

The Department of Energy has itself acknowledged that it does not have a technical basis for assessing the radiological consequences of spent nuclear fuel storage canister breach such as from expected chloride-induced stress corrosion cracking.

Spent nuclear fuel canister aging and degradation in the face of ongoing repository delays is going to require repackaging the spent nuclear fuel at existing SNF storage sites and yet no method has been designed for repackaging the spent nuclear fuel. The Draft HALEU EIS needs to explain who will pay for the cost of spent nuclear fuel repackaging that will be needed as decades continue to go by without a repository.

The cost of attempting to design, license and operate one or several repositories for spent nuclear fuel is not being admitted and there has been no money collected via the Nuclear Waste Fund since 2014 because the DOE has no repository program.

043-3 (cont'd)

The electric utilities have been permitted use methods of spent nuclear fuel storage that complicate repackaging, complicate transportation and complicate disposal, all with the U.S. Nuclear Regulatory Commission's approval. The utilities don't worry about cost as long as it comes from the U.S. taxpayer and not from them.

Future generations will likely be stuck with needing billion-dollar-each repackaging facilities at each of the 75 commercial power plant sites. DOE's HALEU production aims to create far more stranded fuel sites as small and micro reactors are deployed and no place is designated for this spent nuclear fuel to go. The Draft HALEU EIS states that HALEU spent nuclear fuel is to be stored on-site at the reactor generating the spent nuclear fuel (Section 2.1.7.3). For the tri-structural isotropic (TRISO) coated particle fuel for advanced nuclear reactors including several proposed mobile reactors that are to be deployed, this spent nuclear fuel will be located near your home, school, hospital — and the spent nuclear fuel may be staying more permanently than the residents.

The NRC's 2014 generic EIS also presumes safe transport of spent nuclear fuel. Yet, the NRC has allowed increasingly high uranium-235 enrichment and higher burnup fuels. This high burnup fuel, over 45 GWD/MTU for example, has been loaded into dry storage canisters without meeting transportation requirements for the Certificate of Compliance. And now the pressure

043-7

As described in Section 1.0.5.1, "DOE HALEU Supply," and Section 2.4, "Alternatives Considered and Dismissed from Detailed Analysis," of the HALEU EIS, these DOE activities could supply a limited amount of HALEU from downblending. In addition to being insufficient to meet the Proposed Action (the acquisition of 290 MT of HALEU) and as explained in Section 1.1, "Purpose and Need for Agency Action," this amount would not meet the needs of 8 to 12 MT/yr in the 2020s or the 50 MT/yr predicted to be needed by 2035. Thus, the use of DOE stockpiles of HEU to produce HALEU would provide limited and, at most, short-term supplies of HALEU, and would not meet the purpose and need since it would not encourage the development of a commercial enrichment capability. Therefore, downblending DOE stockpiles of HEU was not analyzed in this HALEU EIS.

As to the comment that nuclear energy will impede combatting climate change, DOE is aware of numerous studies showing the benefits of nuclear energy on reducing greenhouse gas emissions and their impacts on climate change (see https://world-nuclear.org/nuclear-essentials/how-can-nuclear-combat-climate-change#:~:text=Nuclear%20power%20plants%20produce%20no,electricity%20when%20compared%20with%20solar and https://www.iaea.org/bulletin/what-is-the-clean-energy-transition-and-how-does-nuclear-power-fit-in). See also Sections 2.6.2 and 2.7.1.3 of the EIS for discussion of the potential decreased greenhouse gas emissions associated with the Proposed Action. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles (https://www.iaea.org/bulletin/what-is-the-clean-energy-transition-and-how-does-nuclear-power-fit-in). See also Sections 2.6.2 and 2.7.1.3 of the EIS for discussion of the potential decreased greenhouse gas emissions associated with the Proposed Action.

In addition, as summarized in Section 2.6 of the HALEU EIS, the impacts to human health from normal operations of HALEU fuel cycle facilities are expected to be SMALL, with the potential for MODERATE human health impacts from some accident scenarios. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management," of this CRD for a discussion of this topic and DOE's response.

043-5 The commenter identifies studies that the commenter believes should result in modifications to the way DOE estimates health risks from radiation exposur0e, including specifically addressing impacts to women, children, and the unborn (birth defects) and impacts other than cancer. The commenter also states that

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will be on the NRC **to grant exemptions** to transportation safety requirements for spent nuclear fuel. [4] [5] Who can say what the level of safety will be?

There is an existing supply of 14.9 metric tons (MT) of HALEU from DOE facilities. The Proposed Action states that it seeks to produce 50 MT/year for a total of 290 MT and also states that **it expects about 500 MT per year to be produced by 2050**. (See page 29 of the Draft HALEU EIS.) Yet, the Draft HALEU EIS that relies on the NRC's 2014 generic EIS had only assumed up to 290 metric tons of HALEU in total.

The Draft HALEU EIS claims that reactor operations, spent nuclear fuel storage and disposal are reasonably foreseeable activities that could result from implementation of the Proposed Action. If the HALEU is not used, the entire effort will be a waste of money and time, and will also result in radiological pollution from the mining, milling, conversion and enrichment processes to make the HALEU.

If reactors do get licensed, designed and built, then 500 MT per year of spent nuclear fuel requiring storage and disposal would be created. Many of the proposed advanced reactor designs, such as the high-temperature gas-cooled reactors that use TRISO fuel are not likely to ever be reprocessed. Tri-structural isotropic or TRISO fuel is solid coated particle fuel in pebble style or prismatic block fuel elements. The TRISO fuel pebbles are coated with silicon carbide. No method has been developed for TRISO fuel reprocessing and it may not be possible or affordable. Therefore, the burden of disposal of TRISO spent fuel made from HALEU and other HALEU fuels must be acknowledged. The burden of spent nuclear fuels from the various advanced reactor designs needs to be acknowledged. The high enrichment of HALEU will mean that the fuel requires more containers and more space in a disposal repository.

In the U.S., reprocessing of commercial spent nuclear fuel was conducted at West Valley, New York. The result was uneconomical and environmentally damaging while creating weapons material proliferation risks — even if renamed "recycling." [6] HALEU production inherently increases weapons material proliferation concerns. The cost and the radiological polluting of reprocessing has not been adequately addressed in the Draft HALEU EIS or the EISs it cites. In addition, it needs to be made clear when uranium-235 is sought, or plutonium-239 is sought. Because it is laughable to want to reprocess in order to get more plutonium-239 when the DOE is seeking to dispose of several metric tons of surplus plutonium and at great cost. The expense and risk posed by the aging storage of depleted uranium that there is already far too much of is also not adequately addressed.

[4] U.S. Nuclear Waste Technical Review Board, *Preparing for Nuclear Waste Transportation – Technical Issues that Need to be Addressed in Preparing for a Nationwide Effort to Transport Spent Nuclear Fuel and High-Level Radioactive Waste*, A Report to the U.S. Congress and the Secretary of Energy, September 2019. See Figure A-1.

[5] U.S. Nuclear Waste Technical Review Board, *Evaluation of the U.S. Department of Energy Research and Development Activities on the Disposition of Commercial Spent Nuclear Fuel in Dual-Purpose Canisters*, February 2024. https://www.nwtrb.gov/our-work/reports/evaluation-of-the-u.s.-department-of-energy-research-and-development-activities-on-the-disposition-of-commercial-spent-nuclear-fuel-in-dual-purpose-canisters-(february-2024)

[6] John C Wagner, *House Energy and Commerce Committee, American Nuclear Energy Expansion: Spent Fuel Policy and Innovation Hearing Testimony Summary*, April 10, 2024.

043-7 (cont'd)

043-4 (cont'd)

043-8

DOE, and other agencies, have ignored or actively suppressed information about the level of exposure to workers and the public from the operation of their nuclear facilities. DOE takes its responsibility for the safety and health of the workers and the public seriously. DOE prepared the HALEU EIS and included information necessary to determine the potential for environmental impacts associated with the proposed action. DOE disagrees with the implied assertion that the health effects from radiation exposure would be misrepresented while implementing the HALEU EIS proposed action. DOE does not ignore scientific evidence for the health effects from radiation. As needed, DOE updates its radiological protection requirements to implement requirements consistent with the latest approved information from the International Committee on Radiation Protection (ICRP) and the U.S. Environmental Protection Agency (EPA). For the public and environment, these requirements flow to several DOE orders and standards (for example, DOE Order 458.1, "Radiological Protection of the Public and the Environment"). In the future, it is possible that a consensus could be reached by those organizations responsible for developing radiation protection information (including the ICRP and EPA) that regulations need to be updated based on more recent studies assessing to address radiological impact data. At that time, DOE and other regulatory authorities would take steps to address the implications of those changes to their radiological protection requirements and update as necessary. While the other impacts the commenter identify have been linked to radiation exposure (although additional research is warranted for the link between low dose exposures and cardiovascular disease) these impacts are either not as severe as LCF or occur at a lower probability. Therefore, the use of just the exposure and LCF information provides an adequate and acceptable means to assess the differences in health impacts between alternatives. DOE also disagrees with the implied assertion that data would be obscured while implementing the HALEU EIS proposed action. Issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. However, an assessment of the affected environments, including health impacts from prior operations at specific locations, is not appropriate for this EIS but would be included in future NEPA analysis by the relevant regulatory authority for sites identified as potential locations for fuel cycle activities. See Section 2.4, "Legacy Issues," of this CRD for additional information.

043-6 DOE acknowledges your concern regarding the cost of the HALEU program. Please see the cost discussion in Section 2.8, "Out of Scope," of this CRD for additional information. In addition, the scope of this EIS is limited to the Proposed Action which involves HALEU. Other nuclear energy technologies (e.g., UAMPS SMRs running on LEU fuel, MOX fuel), fuel reprocessing, and liquid HLW storage and disposal, are outside the scope of this EIS.

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When it comes to uranium mining and milling, little progress has been made in cleaning up uranium mines and mill tailings sites. "The site remediation costs have exceeded costs originally envisioned by Congress, the agencies, and the licensees due to an evolving understanding of the complexities and risks posed by unintended releases of contaminants from uranium mill tailings." [7] Replace the words uranium mill tailings, as needed for every activity associated with the uranium fuel cycle, and the same statement can be applied to every activity being proposed by the Department of Energy in its Draft HALEU EIS. These are either already forever contamination sites or are destined to become a forever contamination site.

Despite decades of studying the effects of ionizing radiation on human health, the last several decades can be remembered for what the Department of Energy and the nuclear industry in the U.S. have refused to learn about the harm of radiation on human health. The evidence is there that chronic low doses of radiation especially from ingestion of contaminated food is especially harmful to the child developing in utero and to children. [8] Following nuclear power plant closures, decreases in the radioactivity of milk has been noted and reductions in infant deaths and incidence of childhood cancer. [9]

The nuclear industry continues to turn a blind eye to the harm it has caused and to any information that would cause it to need to rein in its generous spread of radiological contamination.

No one who cares about actual solutions for climate change would ever support DOE's costly, polluting, slow and unsafe nuclear reactor schemes. DOE's Proposed Action in an unstated way, embraces the scenario that HALEU is not actually used in reactors to any significant degree, in order to avoid explaining the reactor safety risks and the risks and costs of additional spent nuclear fuel disposal.

HALEU Production is Highly Polluting

As the Draft HALEU EIS Proposed Action would include, the DOE wants to facilitate the establishment of highly polluting and unaffordable commercial HALEU fuel production. The acquisition of HALEU fuel would be made available to commercial use or demonstration projects, such as TerraPower Natrium nuclear reactor and X-energy high-temperature gas-cooled reactors.

The Department of Energy's Proposed Action, states in several places that under the Proposed Action, DOE seeks to acquire HALEU enriched to "at least 19.75 and less than 20 weight percent U-235." (See the Draft EIS Summary including page 3, page 10 and also Figure

[7] Congressional Research Service, Prepared for Members and Committees of Congress, *Long-Term Federal Management of Uranium Mill Tailings: Background and Issues for Congress*, R45880, February 22, 2021.
[8] Jay M. Gould with members of the Radiation and Public Health Project, Ernest J. Sternglass, Joseph U. Mangano, and William McDonnell, *The Enemy Within – The High Cost of Living Near Nuclear Reactors – Breast Cancer, Aids, Low Birthweights, and Other Radiation-Induced Immune Deficiency Effects*, Four Walls Eight Windows, 1996. ISBN 1-56858-066-5. See pages 131 and 281.
[9] Joseph J. Mangano, Jay M. Gould, Ernest J. Sternglass, Janette D. Sherman, Jerry Brown and William McDonnell, Radiation and Public Health Project, "Infant Death and Childhood Cancer Reductions after Nuclear Plant Closings in the United States," *Archives of Environmental Health*, Vol. 57 (No.1), January/February 2002.

043-9

043-2 (cont'd)

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043-7 DOE acknowledges the commenters' points of contention and concerns about transportation and canisters. Regarding transportation, the HALEU EIS includes a detailed transportation analysis of the HALEU fuel cycle activities. The analyses in this EIS show that such risks are SMALL. As discussed in Section 3.6 and in Section A.6 of Appendix A of the Final HALEU EIS, the transportation activities would result in a small collective population risk, which is a measure of the total risk posed to society as a whole. Specific details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Table A-8 of Appendix A in the Final HALEU EIS summarizes the transportation risks for each activity within the HALEU fuel cycle. The NRC has the main responsibility for and already evaluated the potential impacts of SNF transports. These transports would be expected to follow the applicable requirements in the Code of Federal Regulations (e.g., 10 C.F.R. Part 71, 49 C.F.R. Part 173). While DOE appreciates the Board's recommendation regarding canisters, until the characteristics of the fuels are finalized, specifics about cannisters and/or storage cask designs are not ripe for analysis. Consistent with the findings in the NRC 2014 final rule on the environmental effects of continued storage of spent nuclear fuel (73 Fed. Reg. 59551) and NUREG-2157, Generic Environmental Impact Statement (GEIS) for Continued Storage of Spent Nuclear Fuel, the GEIS concluded that impacts from continued storage of SNF for 60 years, including the potential impacts of transporting the SNF that are stored in the dry storage casks to a final repository would be SMALL See also Section 2.6, "Transportation," of the CRD for additional information.

043-8 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low-enriched uranium. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

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F.1-1.) Despite this erroneous error, it seems that DOE is actually seeking "a program to support the availability of uranium enriched to greater than 5 and less than 20 weight percent uranium-235." (See its June 5, 2023 Federal Register Notice.)

043-2 (cont'd)

The HALEU production will include uranium mining and milling, conversion of uranium ore into uranium hexafluoride, uranium enrichment, uranium deconversion from uranium hexafluoride to others forms such as metal and oxide forms, transportation, and storage.

The Draft HALEU EIS states that it is reasonably foreseeable that the following activities could result: fuel fabrication, use in nuclear reactors, and spent fuel storage and disposition. But the Draft HALEU EIS only makes pathetic statements pertaining to DOE's commitment to spent nuclear fuel disposal. The Department of Energy has no spent nuclear fuel disposal program.

The Department of Energy has not cleaned up its radiological contamination or its waste from spent nuclear fuel reprocessing for weapons programs. The DOE's pattern of not cleaning up its messes and putting workers and communities at risk continues. No one who understands DOE's actual history and status of its lack of cleanup would be in favor of this expensive and radiologically contaminating HALEU Proposed Action. Extensive problems remain still unsolved at DOE's Hanford Site, Savannah River Site, Idaho National Laboratory and many other sites.

043-9 (cont'd)

The Department of Energy has failed for the last two decades to provide any meaningful help to combat climate change. The deployment of a few micro-reactors will not make any meaningful difference to reduce the use of fossil fuels. The speculative gamble of TerraPower's sodium-cooled fast reactor is likely to mean in about twenty years from now, a single reactor might intermittently operate, with the risk of catastrophic failure.

043-2 (cont'd)

More About Highly Polluting HALEU Production and DOE's Disinformation

The Department of Energy wants to encourage commercial producers to invest in the necessary fuel cycle infrastructure and gear up production to provide the expected amount of HALEU needed for commercial use or demonstration projects.

The production of HALEU under DOE's Proposed Action is acknowledged by DOE to require the following:

- Uranium mining and milling
- Conversion of uranium ore into uranium hexafluoride
- Uranium enrichment to HALEU
- Deconversion of uranium hexafluoride to oxides or metal
- HALEU storage
- Transportation of uranium between activity locations

The use of HALEU will also involve fuel fabrication, and its use in nuclear reactors will generate spent nuclear fuel that require continued storage and either disposal or reprocessing.

043-9 Comment Summary on page 6, the commenter presents opinions about releases of radioactive material from uranium fuel cycle activities, cleanup of contamination, costs of cleanup, and health effects from exposure to chronic low doses of radiation. The commenter specifically mentions effects on developing children. On page 7, the commenter presents opinions about the lack of spent nuclear fuel disposal options and about the DOE not cleaning up radioactive contamination and radioactive waste at many sites. On page 28, the commenter presents opinions about radiologically contaminated sites created by uranium fuel cycle activities, the failure to cleanup these sites to EPA standards because of cost, and the action to leave waste and contaminated sites fenced and deemed to be cleaned up forever as long as no one will ever live there. The commenter also claims that characterization of the radionuclide contamination that remains and the length of time that the land remains unsafe to live on or grow food on are deliberately obscured. On pages 29 through 32, the commenter presents opinions about the failure to cleanup sites created by uranium fuel cycle activities, historical contamination issues, contamination levels greater than remediation goals, increased cancer rates due to contamination, inadequate monitoring, improper storage of radioactive waste, disproportionate effects on indigenous population, actions by DOE to transfer responsibility for radiologically contaminated site cleanup to other agencies, and inadequacy of models for determining health effects. The commenter mentions that the sites are contaminated forever. Pages 37 and 38 present the commenters opinions about radioactive material releases from specific sites, elevated cancer risks from specific sites, failure of DOE to identify all of the radioactive constituents in material at the sites, a deliberate lack of meaningful radiological monitoring, and releases of hazardous chemicals such as hexavalent chromium from specific sites. In page 39, Table 3, the commenter lists radionuclide contaminants in INL reprocessed fuel shipped to Y-12 and Portsmouth. From pages 44 and 45, the commenter discusses opinions about the failure of DOE to acknowledge detrimental human health effects such as cancer from radiation exposure and the dishonesty of DOE in manipulating and concealing epidemiological results. On pages 52 and 53, the commenter presents opinions about elevated cancer rates in Idaho being the result of releases from the Idaho National Laboratory.

Response: DOE takes its responsibility for the safety and health of the workers and the public seriously. DOE prepared the HALEU EIS and included information necessary to determine the potential for environmental impacts associated with the proposed action. Contamination impacts related to the proposed action are addressed in the HALEU EIS and in the Leidos technical report (Leidos, 2023) that supports the EIS. Issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. However, issues related to legacy contamination cleanup at other sites and disclosure are not within the scope of the HALEU EIS. (See Section 2.4, "Legacy Issues," of this CRD) DOE also acknowledges the commenter's concern about cancer rates but establishment of a cause for any

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All of these activities for HALEU involve the poisoning the workers, the public and the environment with radioactive materials. Some of the poisoning happens sooner, some of it later.

The Department of Energy and other nuclear boosters are making several incorrect claims:

1. Myth: *Nuclear energy is needed to combat climate change*. In fact, nuclear energy is too slow to deploy and also so expensive, that it impedes the ability to combat climate change.

2. Myth: *Nuclear energy is affordable.* In fact, the construction costs alone make nuclear energy unaffordable. But the cost of spent nuclear fuel storage for decades and who knows for how long, and the cost of nuclear fuel disposal also must be considered. The cost of spent nuclear fuel disposal is being low-balled by the Department of Energy, and reported by the U.S. Government Accountability Office as though the cost estimates had any credibility. The Department of Energy has no program to site any repository and continues to have no plan to site one (or more). The costs of the repositories we already need, will be the burden of future generations. The Department of Energy and nuclear boosters love to say that reprocessing spent nuclear fuel is the solution, but they don't admit the cost of reprocessing let alone the radiological pollution and resulting waste to dispose of. And when reprocessing might be conducted on certain spent nuclear fuel, they don't admit that how the bulk of the spent nuclear fuel will remain, still needing disposal.

3. Myth: *Nuclear energy has a small footprint*. The land where many nuclear reactors have operated is increasingly becoming the permanent dumping ground for radioactive materials. Also, the spent nuclear fuel is stranded at nuclear reactor sites and as spent nuclear fuel in dry storage degrades and the casks or canisters degrade, this spent nuclear fuel poses increasing storage and transportation safety challenges. The routine airborne releases and the groundwater releases depend on the reactor type, but can be spread far and wide, entering the food chain and entering our bodies. Accidents involving a nuclear reactor, spent fuel in a pool or in dry storage, transportation accidents, or sabotage can involve permanent contamination of vast areas of land. Spent nuclear fuel disposal will also require large repositories and even with reasonably expected performance of the repository, will trickle out radioactive contamination for over a million years.

4. Myth: *Nuclear energy is needed for reliable base-load power*. In fact, the nuclear reactors expected to use HALEU like the TerraPower Natrium, a liquid-metal cooled fast neutron reactor, have a record of frequent and long outages. And high-temperature gas-cooled reactors, like X-energy wants to build that also use HALEU, also have a poor operating record. The Fort St. Vrain reactor in Colorado was a high-temperature gas-cooled reactor that had frequent maintenance problems. The reality is that fossil-fueled plants will remain online to provide power for these unreliable so-called "advanced" nuclear reactors.

5. Myth: *Nuclear energy is clean*. In fact, with routine activities from mining, milling, fuel fabrication, nuclear reactor operation, fuel reprocessing, and radioactive waste disposal, nuclear energy has caused countless radiologically contaminated sites across the U.S. Cancer rates can be shown to increase near every operating nuclear reactor. [10]

[10] Jay M. Gould with members of the Radiation and Public Health Project, Ernest J. Sternglass, Joseph U. Mangano, and William McDonnell, *The Enemy Within – The High Cost of Living Near Nuclear Reactors – Breast Cancer,*

043-4 (cont'd)

043-6 (cont'd)

043-10

043-11

of the cancer rates is not within the scope of the HALEU EIS. DOE disagrees with the implied assertion that the health effects from radiation exposure would be misrepresented while implementing the HALEU EIS proposed action. DOE does not ignore scientific evidence for the health effects from radiation. As needed, DOE updates its radiological protection requirements to implement requirements consistent with the latest approved information from the International Committee on Radiation Protection (ICRP) and the U.S. Environmental Protection Agency (EPA). Requirements for nuclear fuel cycle facilities would be enforced by the responsible regulatory agencies. DOE also disagrees with the implied assertion that radioactive contamination and waste would be improperly managed, that monitoring would be inadequate, and that data would be obscured while implementing the HALEU EIS proposed action. All radioactive wastes would be handled, treated, packaged, stored, and transported in compliance with regulatory and permit requirements. Environmental surveillance programs would collect and analyze samples or make direct measurements of air, water, soil, biota, and agricultural products in accordance with the requirements of the cognizant regulatory authority. The requirements of the cognizant regulatory authority to protect the public and the environment against undue risk from radiation associated with radiological activities would be implemented (e.g. public dose limits in both 10 C.F.R. 20 and 10 C.R.F 50 for NRC licensed facilities). Monitoring activities would be performed by regulatory agencies and facility operations to generate measurement-based estimates of the amounts or concentrations of contaminants in the environment. Measurements would be performed by sampling and laboratory analysis or by "in place" measurement of contaminants in environmental media. Data from monitoring would be available in environmental surveillance reports. DOE acknowledges the commenter's concerns regarding the lack of a permanent repository for spent nuclear fuel (SNF). Storage and disposition of SNF are discussed in Sections S.8.1.7, 2.1.7.3, and 3.7.3 of the EIS. DOE remains committed to meeting its obligations to manage and, ultimately, dispose of SNF.

043-10 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Commercialization of the HALEU fuel cycle would provide incentive for companies to invest in the development of HALEU fuel production capabilities which in turn would provide advanced reactor developers with the surety that fuel would be available for their reactor designs. Comments about funding are not within the scope of the HALEU EIS. The EIS addresses the reasonably foreseeable activities of advanced nuclear reactor operation with HALEU (see Sections S.8.1.7, 2.1.7.2, 3.7.2, and A.7.2 of the EIS, and Section 8 of the Leidos Technical Report [Leidos 2023]) and spent nuclear fuel disposition (see Sections S.8.1.7, 2.1.7.3, 3.7.3, and A.7.3 of the EIS and Section 6.7 and Tables 6-3 and 8-2 of the Leidos Technical Report]), to the extent practicable. An in-depth analysis of advanced reactors is not ripe for this

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Radiological releases contaminate air, soil, and water and enter the food chain. The radioactive particles enter our bodies, in chronic exposures, and especially harm women, children and the unborn developing child. [11] Accidents involving nuclear material are excluded from home and auto insurance policies. The Price-Anderson Act liability coverage will not necessarily cover damages at all for consolidated spent nuclear fuel storage or transportation, and won't cover reactors smaller than 100 megawatts even though the radiological consequences can still be wide-spread and severe and will not be covered by home or auto insurance. [12] See the 2021 report by the U.S. Nuclear Regulatory Commission discussing the Price-Anderson Act [13] and the 2023 report by the Department of Energy. [14]

043-11 (cont'd)

When nuclear boosters promote nuclear energy as "small footprint," they tend to leave out the space required for spent nuclear fuel disposal as well as other radioactive waste disposal. **The U.S. already has over twice as much spent nuclear fuel (existing now or expected to be produced from currently licensed reactors) than was allotted for the Yucca Mountain repository.**

043-3 (cont'd)

DOE Engaging in Fast Reactor Disinformation

The Department of Energy is giving money to Bill Gates' backed TerraPower, that is planning to build a 345-MWe sodium-cooled fast reactor, called "Natrium," in Kemmerer, Wyoming, that scales up the INL's former 20 MWe EBR II sodium-cooled reactor. The Natrium reactor will be accompanied by a molten salt-based energy system. [15] TerraPower claims Natrium can be running by 2030 – which appears unrealistic. INL is collaborating with the nuclear fuel design, despite the news that the fuel material will be imported from Russia, rather than INL's HALEU from EBR-II from its Materials and Fuels Complex. [16] [17]

043-10 (cont'd)

Aids, Low Birthweights, and Other Radiation-Induced Immune Deficiency Effects, Four Walls Eight Windows, 1996. ISBN 1-56858-066-5. See pages 131 and 281.

[11] "Health Risks from Exposure to Low Levels of Ionizing Radiation BEIR VII – Phase 2, The National Academies Press, 2006, http://www.nap.edu/catalog.php?record_id=11340 The BEIR VII report reaffirmed the conclusion of the prior report that every exposure to radiation produces a corresponding increase in cancer risk. The BEIR VII report found increased sensitivity to radiation in children and women. Cancer risk incidence figures for solid tumors for women are about double those for men. And the same radiation in the first year of life for boys produces three to four times the cancer risk as exposure between the ages of 20 and 50. Female infants have almost double the risk as male infants.

[12] See the October 2023 Environmental Defense Institute article, "Will the public be compensated for a radiological release from a spent nuclear fuel storage or transportation accident" Liability coverage ranges from about $13 billion to zero dollars."

[13] H. Arceneaux et al., U.S. Nuclear Regulatory Commission, *The Price-Anderson Act: 2021 Report to Congress – Public Liability Insurance and Indemnity Requirements for an Evolving Commercial Nuclear Industry*, NUREG/CR-7293, December 2021. https://www.nrc.gov/docs/ML2335/ML21335A064.pdf

[14] U.S. Department of Energy, *The Price-Anderson Act Report to Congress*, January 2023.

[15] David Pace, *The Idaho Falls Post Register*, "INL director joins Bill Gates at future Natrium reactor site," May 5, 2023.

[16] Dustin Bleizeffer, *WyoFile*, *The Idaho Falls Post Register*, "TerraPower boost nuclear fuel effort amid calls for import ban," March 23, 2022.

[17] Environmental Defense Institute, April 2022 newsletter article, "HALEU Fuel for the TerraPower's Proposed Sodium-Cooled Natrium Nuclear Plant Could be Impacted by Ban on Russian Imports of Low-Enriched Uranium."

EIS and therefore, consideration of specific reactor accidents and consequences for advanced reactor designs are out of scope for this EIS. However, the safety of proposed advanced reactors, including those that use sodium as a coolant, are expected to be addressed during the licensing of an advanced nuclear reactor. The licensing process for advanced reactors, that would be undertaken in the future by the cognizant regulatory authority, would be expected to consider a comprehensive set of accident sequences and the likelihood and consequences of these accidents. The analyses for these accidents may consider that the Experimental Breeder Reactor (EBR)-II and the Fast Flux Test Facility (FFTF) demonstrated safe operation with sodium as the coolant. The advanced nuclear reactors would be designed to prevent or mitigate the consequences of accidents considered by the reactor designers. Potential impacts related to transportation associated with reactor operation and spent nuclear fuel are addressed in the HALEU EIS at Sections S.7.1.6, 2.1.6, 3.6 of the EIS, and Section 6 of the Technical Report (Leidos, 2023). For additional discussion related to transportation, please refer to Section 2.6, Transportation" of this CRD. For a discussion about sabotage concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS and Section 2.3, "Nonproliferation and Terrorism," of this CRD. Site specific analysis would be evaluated by the regulatory agencies responsible for nuclear facilities, and the evaluations would be expected to consider mechanisms to prevent or mitigate releases from the nuclear facilities.

043-11 Although legacy contamination has occurred from past uranium recovery and enrichment activities, significant evolution of practices, regulations, and oversight has greatly reduced the potential for contamination. DOE understands the impacts created by historic mining practices, which is why independent of the Proposed Action, DOE created the Office of Legacy Management (as discussed in Section 2.4, "Legacy Issues" of this CRD). However, mining regulations, BMPs, and Mitigation practices have become more protective. Further, as described throughout the Technical Report (Leidos, 2023), ongoing activities at existing facilities (also see Figure 1-3 of the Technical Report) and construction and operation of new facilities are, and would be, conducted under the cognizant regulatory agencies' NEPA evaluations and associated license and permitting conditions. This EIS uses the latest NEPA impact data for all potential sites, and surrogates for others, to allow subject matter experts (SMEs) to predict the potential impacts from the use of the resource for production of HALEU. The Technical Report (Leidos, 2023) prepared by DOE in support of the EIS considers the evaluation of impacts through the incorporation by reference of past NEPA documentation that certain level of resource impact did occur as part of construction or is on-going within existing facility operations. The Final EIS has been updated to include specific hot links to the appropriate sections of the 500+-page Technical Report (Leidos, 2023) to provide more detailed analyses of the basis for the conclusions, including consideration of present-day regulations and oversight.

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Despite billions of dollars spent world-wide on this type of reactor, sodium-cooled fast reactors have a long legacy of poor reliability and premature shutdown. Experience with the U.S. Fermi nuclear plant, France's Super Phoenix, and Japan's Monju and others have proven sodium-cooled reactors to be costly and prone to frequent outages. Sodium-cooled reactors are considered the most difficult to operate due to sodium fires and prone to sudden catastrophic failure. *043-10 (cont'd)*

A vast amount of misinformation is coming directly from the Department of Energy, like misleading claims that a sodium-cooled fast reactor can burn spent nuclear fuel, see https://www.energy.gov/ne/articles/3-advanced-reactor-systems-watch-2030 where DOE implies that sodium-cooled fast reactors can burn spent nuclear fuel from current reactors. If sodium-cooled fast reactors could burn the vast amounts of spent nuclear fuel from US commercial nuclear reactors, then HALEU production would not be needed, would it? False claims by the Department of Energy have become the norm.

While the Department of Energy prefers to call spent nuclear fuel a "resource" rather than a waste, the Department of Energy actively avoids admitting the full costs of spent nuclear fuel management and disposal. While it is true and has been known for decades that plutonium is created when uranium-238 absorbs a neutron and plutonium can also fission in a nuclear reactor, the Department of Energy's claims that a sodium-cooled fast reactor can burn "nuclear waste" are misleading. The Natrium reactor will produce more nuclear waste than it can burn and cannot use but perhaps a tiny fraction of the existing nuclear waste for its fuel. *043-3 (cont'd)*

Furthermore, the Natrium reactor will not be deployed in time to help combat climate change, and its high cost will take resources away from more timely, affordable and effective solutions. *043-4 (cont'd)*

Construction has not yet started on the 325 megawatt-electric (MWe) Natrium sodium-cooled fast reactor nuclear plant. Sodium-cooled fast reactors are the least safe to operate, create the comparatively far more radioactive waste disposal problems and will require costly conditioning to remove the salt before disposal via pyroprocessing. *043-10 (cont'd)*

When used in the reactor, the HALEU (up to 20 percent enriched in uranium-235) will create more plutonium and that plutonium will be a weapons proliferation risk as well as a spent fuel disposal problem. *043-8 (cont'd)*

The higher the fissile content in the spent fuel, the greater the criticality hazard for transportation, storage and disposal. The criticality risk may not peak until 25,000 years after removed from a reactor, despite the lack of regulations for criticality beyond 10,000 years by the U.S. Environmental Protection Agency.

About half of the money to build the $4 billion Natrium reactor is coming from the Department of Energy. And now Natrium backers are seeking lawmakers to provide another $2.1 billion to support HALEU fuel production. *043-6 (cont'd)*

HALEU fuel production releases airborne radiological contamination and is expensive even when aided by existing highly enriched uranium-235 material already accumulated by the U.S. Department of Energy, such as from the EBR-II reactor research. The pyroprocessing of EBR-II *043-12*

043-12 The Proposed Action does not include downblending. As discussed in Section 2.4 of the HALEU EIS, downblending of existing surplus stockpiles of HEU to produce HALEU was an alternative that was considered but dismissed from further analysis in the HALEU EIS. Downblending existing HEU to produce HALEU would not meet the purpose and need for the Proposed Action. The processing of EBR-II fuel in Idaho is outside the scope of the HALEU EIS.

fuel in Idaho is causing excessively high airborne radiological releases and is being paid for by taxpayers.

043-12 (cont'd)

Technical Immaturity of Spent Nuclear Fuel Repository Concepts and Absence of a Repository Siting Program Must Be Evaluated

The Department of Energy mischaracterizes the magnitude of the unsolved technical challenges for finding a permanent solution to the radioactive waste problem posed from nuclear energy. The Department of Energy's recent "Liftoff" document implies that the spent nuclear fuel problem isn't a big problem because the volume of spent nuclear fuel "is quite small" and stating that the volume of spent nuclear fuel "could fit on a single football field at a depth of less than 10 yards." [18]

The fact is that the Department of Energy was needing 41 miles of waste emplacement tunnels (or drifts) at the proposed Yucca Mountain repository as limited by law to 70,000 metric tons of spent nuclear fuel. And this assumed repackaging and positioning the waste to limit the thermal heat load. [19] The football field analogy is highly misleading. And the U.S. already will have about 140,000 metric tons of spent nuclear fuel to dispose of, even without any new reactors going online.

Despite the much photographed Yucca Mountain, the Yucca Mountain repository was never granted a license to construct, was never built, and never had a technically sound basis for confining the radioactive waste.

043-3 (cont'd)

Typical commercial nuclear spent fuel is enriched to less of 5 percent enriched. HALEU is expected to be enriched to "at least 19.75 and less than 20 weight percent uranium-235." **The use of high-assay low-enriched uranium (HALEU) inherently means enriched uranium-235 is more available for diversion to nuclear weapons and creates nuclear material security problems.** So much for being "secure."

The higher enriched HALEU fuels will require disproportionately more space in a disposal repository. HALEU would be used to make TRISO fuels proposed for high-temperature gas-cooled reactors and for the fuel for the TerraPower Natrium liquid-metal fast reactor.

The TRISO fuel would be more difficult to reprocess than many other fuels because of various silicon impurities and high loadings of carbon fines, [20] and no process has been developed to reprocess TRISO fuel. The cost of reprocessing, the airborne polluting while

[18] U.S. Department of Energy webpage, Pathways to Commercial Liftoff: Advanced Nuclear, March 2023. https://www.energy.gov/lpo/articles/sector-spotlight-advanced-nuclear See page 35.

[19] U.S. Department of Energy, *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, DOE/EIS-0250F-S1D, October 2007. https://www.energy.gov/sites/prod/files/EIS-0250-S1-DEIS-Summary-2007_0.pdf

[20] Charles W. Forsberg and David L. Moses, Oak Ridge National Laboratory, *Safeguards Challenges for Pebble-Bed Reactors Designed by People's Republic of China*, ORNL/TM-2008/229, November 2009.

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reprocessing, the extra radioactive waste generated by reprocessing [21] and the weapons material theft are problems with reprocessing spent fuel.

Similar TRISO spent fuel languishes in the U.S. Fort St. Vrain spent nuclear fuel and also in Germany, and remains costly to store decades after the reactors were shuttered. So much for being "affordable." There may be safety advantages to the TRISO fueled Xe-100 reactor, but information isn't available to make much of an assessment.

The Department of Energy conducted a study completed in 2023 about Xe-100 reactor impacts on a repository, but that report, mentioned at the August 2023 U.S. Nuclear Waste Technical Review Board Meeting, is still withheld from the public. [22] Apparently, the waste disposal characteristics of Xe-100's spent fuel are not something the public should be told about.

The difficulty in disposal of TRISO fuel and reactor internals will depend on whether or not the graphite can be disposed of with the spent fuel and whether or not the graphite exceeds Class-C low-level radiative waste criteria. In addition, when the carbide in TRISO fuel is exposed to water, flammable gases are generated, which may be significant. Also, the more highly enriched the fuel, above 3 to 5 percent, additional measures may be needed to ensure criticality control after disposal, particularly if the fuel is separated from the graphite blocks. [23]

X-energy's design is for a 60-year reactor design life and for an 80-year spent fuel storage design. X-energy is stating that **"X-energy has engaged with the DOE to strategize their acceptance of all spent fuel within the 80-year period."** [24] **But this statement is no guarantee that there will be a permanent repository in 80 years.**

The Bill Gates TerraPower Natrium reactor would also use HALEU fuel but its spent nuclear fuel may require processing prior to placement in a repository. The metallic sodium-bonded fuel may require treatment to remove metallic sodium. [25] That reprocessing, dry pyroprocessing, will be costly and will release radionuclides to the skies. Pyroprocessing has been conducted only on a small scale, and has left radioactive waste yet to be disposed of.

Advanced reactor designs using HALEU fuels may differ substantially from existing commercial spent nuclear fuels currently stored. The Natrium reactor, X-Energy reactor, and a variety of others are being proposed. The Department of Energy is eager to encourage any and all proposed reactors. **And for each reactor and its fuel design and use, the HALEU fuels may need different handling, storage, transportation and disposal options. These new fuels**

043-3 (cont'd)

[21] *Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy*, 2012.
[22] Brady Hanson, Pacific Northwest National Laboratory, Laura Price, Sandia National Laboratory and others, *Report of the Back-End Management of Advanced Reactors (BEMAR) IPT on the X-energy's Xe-100 Reactor,* April 25, 2023, Revision 1. CUI Categories: SP-EXPT-SP-PROPIN/PRIVILEGE. Report front cover only was provided at the August 2023 NWTRB meeting presentation by Ned Larson, U.S. Department of Energy.
[23] Laura Price, Sandia National Laboratories, *Using Past Experience to Inform Management of Waste from Advanced Reactors and Advanced Fuels*, SAND2022-10873C, 2022. https://www.osti.gov [2004321.pdf]
[24] X-energy, Letter from X-energy to U.S. Nuclear Regulatory Commission, "Submittal of X Energy, LLC (X-energy) Xe-100 White Paper Slide Deck, 'Spent Fuel Management White Paper,'" 2023-XE-NRC-002, January 10, 2023. https://www.nrc.gov/docs/ML2301/ML23011A324.pdf Project No. 99902071.
[25] Ned Larson, U.S. Department of Energy, Office of Nuclear Energy, "Back-end Management of Advanced Reactors (BEMAR)," U.S. Nuclear Waste Technical Review Board Public Meeting, Idaho Falls, Idaho, August 30, 2023.

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present a challenge to Department of Energy research programs that are supposed to provide a technical basis for storage and disposal. DOE acknowledges that it has fallen behind and expects to only fall further and further behind. [26]

The DOE's EIS contains disinformation about the dismal state of DOE's spent nuclear fuel disposal program. The HALEU EIS includes one paragraph to address disposal of spent nuclear fuel. Paragraph 3.7.33 states:

"The program for a geologic repository for SNF at Yucca Mountain, Nevada, has been terminated. However, DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF (DOE, 2022). In the interim, as described above, SNF is being safely stored."

It is correct that the proposed and never granted a license-to-construct repository at Yucca Mountain was defunded in 2010. But the statement that "DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF" references a **footnote** in an Environmental Impact Statement for the Versatile Test Reactor (DOE/EIS-0542).

That VTR EIS footnote states:

"DOE remains committed to meeting its obligations to manage and, ultimately dispose of spent nuclear fuel."

Isn't it odd that the only way DOE could offer any statement of its commitment to dispose of commercial spent nuclear fuel was to refer to a footnote in another EIS for a research reactor that does not generate commercial spent nuclear fuel, stating only the DOE remains committed to meeting its obligations to manage and, ultimately dispose of spent nuclear fuel?

Saying that the DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF is as empty as the promise DOE made, in the Standard Contract with electric utilities that operated commercial nuclear reactors, that DOE would begin taking ownership of commercial spent nuclear fuel in 1998.

There is no reason to have confidence that the DOE has a commitment to meet its obligations under the Nuclear Waste Policy Act. The Department of Energy, despite promising to open a spent nuclear fuel repository by 1998, and then by 2010, has utterly failed to do so. Furthermore, the Department of Energy's proposed conceptual design for the Yucca Mountain repository was incomplete and technically unsound. It had assumed disposal in canisters that were not being used by commercial nuclear utilities, it assumed technically unsound corrosion rates to lengthen the time to container failure, it squashed water infiltration rates through the repository to lower the trickle out of radionuclides and it assumed titanium drip shields would be installed despite no way to actually install them.

[26] Ned Larson, U.S. Department of Energy, Office of Nuclear Energy, "Back-end Management of Advanced Reactors (BEMAR)," U.S. Nuclear Waste Technical Review Board Public Meeting, Idaho Falls, Idaho, August 30, 2023.

043-3 (cont'd)

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The Department of Energy publishes an annual report of the inventory of commercial spent nuclear fuel and Government-owned spent nuclear fuel. [27] The Department of Energy makes the disclaimer in its report of spent nuclear fuel inventory, including:

> "No inferences should be drawn from this report regarding future actions by DOE, which are limited both by the terms of the Standard Contract and Congressional appropriations for the Department to fulfill its obligations under the Nuclear Waste Policy Act including licensing and construction of a spent nuclear fuel repository."

The DOE's draft HALEU EIS misrepresents the DOE's spent fuel management and disposal problem. The DOE's draft HALEU EIS ignores the unsolved existing spent nuclear disposal problem, and ignores the messes DOE made, starting decades ago and still has not cleaned up, like the DOE's Hanford site in Washington state. [28] [29] There are many contaminated sites at basically every location the Department of Energy conducted any activity associated with nuclear reactors or their fuel.

The DOE's draft HALEU EIS states, without any technical basis, on page 20 of the Summary, that "In a geologic repository, the SNF would be irretrievably stored underground in sealed tunnels." Given that there is no repository sited, no repository design, there is no basis for knowing that the repository would have "tunnels." There is no statement of how many years could elapse before the repository would be sealed. What is the basis for assuming that there is no period of time that could allow the waste to be retrievable. The Draft HALEU EIS has no technical basis for its stated claims.

Apparently, the statements were made in order to make the potential weapons material appear to be protected from theft. The Draft HALEU EIS needs to specifically cite credible sources of information for its statements and also clarify when (after how many years), after waste emplacement in a repository, the repository would be "sealed." It should be noted that the proposed Yucca Mountain repository would have remained unsealed for many years for ventilation and also for the eventual installation of titanium drip shields that were relied upon to achieve the estimated low migration of radionuclides from the waste over time, as water infiltrates the corroded waste.

The Department of Energy, in 2014, had to cease collecting fees for geologic disposal, because DOE has no repository program. Now in 2024, DOE still has no program for geologic disposal. The DOE has **continued to ignore the Nuclear Waste Policy Act** in its proceeding to attempt to cite consolidated interim storage. The DOE has **continued to ignore the Nuclear Waste Policy Act** with regard to the limit on the amount of spent fuel that can be disposed of at

043-3 (cont'd)

[27] U.S. Department of Energy, Prepared by Office of Nuclear Energy, *Spent Nuclear Fuel and Reprocessing Waste Inventory: Spent Fuel and Waste Disposition*, PNNL-33938, FCRD-NFST-2013-000263, November 2022. https://www.osti.gov/biblio/1974547 (Inventory ending calendar year 2021.)

[28] US Government Accountability Office, "Hanford Waste Treatment Plant – DOE Needs to Take Further Actions to Address Weaknesses in Its Quality Assurance Program," GAO-18-241, April 2018. https://www.gao.gov/assets/700/691422.pdf

[29] Annette Cary, *Tri-City Herald*, "Feds bash Hanford nuclear waste plant troubles, question DOE priorities," April 24, 2018. http://www.tri-cityherald.com/news/local/hanford/article209749064.html "The multi-billion-dollar Hanford vitrification plant has been under construction since 2002."

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Yucca Mountain, 70,000 metric tons, and the U.S. is on track to create about twice that with the already generated or expected to be generated spent nuclear fuel.

Cost of a Spent Nuclear Fuel Repository Program Must Be Evaluated

The DOE cost estimates for a spent nuclear fuel repository have been provided as recently as 2019, on the assumption that somewhere, somehow, one or several repositories will be sited, designed and operated. The DOE's cost estimates for addressing the 140,000 MT of spent nuclear fuel is already likely to low by many multiples. The addition of HALEU spent nuclear fuel, of 500 MT/year will not be insignificant especially when the specific characteristics and the volume and number of containers is considered.

Nuclear promoters pathologically repeat nonsense about the cost and the problem of spent nuclear fuel disposal. An example is from Oliver Stone who made a documentary promoting nuclear energy. In an interview, Stone when asked stated that "nuclear waste is 'not an issue' and is 'completely handleable.'" [30]

The actual cost of attempting an experiment to see if the radioactive spent nuclear fuel can be successfully isolated will be cripplingly expensive and is also doomed to fail.

In 2009, the GAO reported its own estimate of the cost to dispose of 153,000 metric tons of spent nuclear fuel and high-level waste by 2055 being from $41 billion to $67 billion (in 2009 dollars). Adding in the already spent $14 billion on Yucca Mountain, this totaled a maximum of $81 billion, over a 143-year period until repository closure. **This estimate included both spent nuclear fuel generated by commercial power reactors, and DOE-managed spent fuel and high-level waste from power, research and navy reactors and high-level waste.** [31] A similar but even higher estimate came from the DOE's 2008 estimate for Yucca Mountain: $96 billion (in 2007 dollars) from 1983 through expected closure in 2133. [32] [33]

In 2010, the Yucca Mountain repository was defunded. And the Department of Energy announced that commercial spent nuclear fuel would go to a separate repository than the DOE-managed nuclear waste repository. Neither repository exists.

A more recent cost estimate was given in 2021 GAO-21-603 for the disposal of commercial spent nuclear fuel as $168 billion. **But this only includes the spent nuclear fuel generated by commercial nuclear reactors and excludes the separate disposal of DOE-managed spent nuclear fuel and high-level waste.** [34]

043-3 (cont'd)

[30] Cliff Conner, *Science for the People Magazine*, "Here We Go Again: Yet Another "Nuclear Renaissance," December 29, 2023. https://magazine.scienceforthepeople.org/online/here-we-go-again/ And also "Oliver Stone says nuclear power is 'the only option' for society," *Independent*, May 2, 2023.

[31] U.S. Government Accountability Office (GAO), "Report to Congressional Addresses, Nuclear Waste Management – Key Attributes, Challenges and Costs of the Yucca Mountain Repository and Two Potential Alternatives," GAO-10-48, November 2009. https://www.gao.gov

[32] World Nuclear News, "Yucca Mountain cost estimate rises to $96 billion," August 6, 2008. https://www.world-nuclear-news.org/wr-yucca_mountain_cost_estimate_rises_to_96_billion_dollars-0608085.html

[33] U.S. Department of Energy, "Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program, Fiscal Year 2007, DOE/RW-0591, July 2008.

[34] U.S. Government Accountability Office (GAO), Report to Congressional Addresses, "Commercial Spent Nuclear Fuel – Congressional Action Needed to Break Impasse and Develop a Permanent Disposal Solution," GAO-21-

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GAO-21-603 cites a 2019 Sandia National Laboratory [35] estimate of the Yucca Mountain spent fuel disposal cost for 109,000 metric tons of spent fuel if the never-built Yucca Mountain repository licensing was restarted. The actual costs will be higher for a number of reasons.

The 2021 GAO report GAO-21-603 [36] states that there was then existing 86,000 metric tons of commercial spent nuclear fuel stored on-site at 75 operating or shutdown nuclear plants in 33 states, an amount that grows by about 2,000 metric tons each year. This depends upon the number of operating nuclear reactors and the number of hours they operate that year. The GAO report also states the estimated total accumulation of commercial spent nuclear fuel, by roughly 2035 (with no new nuclear plants), is 140,179 metric tons but depends on when existing plants permanently shut down and how many new nuclear reactors enter operation. The GAO report buries in a footnote on page 34 is the fact that the cost estimate is limited to only 109,300 metric tons of commercial SNF, not the already expected 140,179 metric tons.

GAO-21-603 cost estimate ignores the fact that the disposal cap of 70,000 metric tons heavy metal (MTHM) on the Yucca Mountain repository — as well as the small detail that there is no repository program at Yucca Mountain or for any other site.

The statutory limit on the amount of spent nuclear fuel Yucca Mountain was limited to is 70,000 metric tons — and so the amount of commercial spent nuclear fuel slated for disposal is already expected to be double the currently legal amount, even without the defense- and research-related government-owned SNF and HLW. The cost of another repository for the defense- and research-related government-owned SNF and HLW is not available and tracking of the increases in this waste, such as Advanced Test Reactor spent nuclear fuel and naval submarine and carrier spent nuclear fuel isn't being addressed by the GAO.

The technical challenges and the high costs and highly uncertain costs of addressing the technical challenges of licensing, building and operating a repository cannot be overstated.

The technical challenges of repackaging welded-closed canisters, of transporting spent nuclear fuel some of which is far larger in length and weight than previously transported, of preventing accidental criticalities in waste with high uranium-235 and/or plutonium content, and of the overall repository create tremendous cost and schedule uncertainty. These technical challenges are going to be costly, not by 20 or 40 percent, but by factors of 2 to 20 or more.

The ability to achieve a successfully operating repository — ever — is questionable. The GAO continues to put an undeserved air of credibility to these highly speculative repository cost estimates.

043-3 (cont'd)

603, September 2021. https://www.gao.gov/nuclear-waste-disposal The estimate for spent fuel disposal at YM is $75 billion to $117 billion is for repository operations beginning in 2031 and from $141 billion to $158 billion for repository operations beginning in 2117.

[35] Geoffrey A. Freeze et al., Sandia National Laboratory, *Comparative Cost Analysis of Spent Nuclear Fuel Management Alternatives*, June 2019. https://www.osti.gov/biblio/1762633

[36] U.S. Government Accountability Office (GAO), Report to Congressional Addresses, "Commercial Spent Nuclear Fuel – Congressional Action Needed to Break Impasse and Develop a Permanent Disposal Solution," GAO-21-603, September 2021. https://www.gao.gov/nuclear-waste-disposal

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The current lack of technical solutions to repackage spent nuclear fuel stored in welded-closed thin-walled canisters —which were not intended for disposal — are another reason that the cost of spent nuclear fuel disposal presented in GAO-21-603 is a gross underestimate.

In the Yucca Mountain repository design initially proposed in 2002, [37] it was assumed by DOE that a smaller amount of spent nuclear fuel would be loaded into a corrosion-resistant TAD canister, and the fuel being used in the 1990s and before was not much of a criticality risk. But, with the increased use of higher and higher burnup fuels, there are many existing spent nuclear fuel dry storage canisters that would have a nuclear criticality if water entered the canister.

In a geologic repository, the existing thin-walled stainless steel canisters would be breached by corrosion quickly, far sooner than the more corrosion resistant TAD canisters that were never used. [38] The utilities considered the TAD relatively expensive and opted for the cheapest dry storage systems licensed by the NRC. I suppose the utilities were and still are expecting the U.S. taxpayer to sort out the mess sometime in the future.

So, for a number of reasons, the DOE seeks the shortcut of not repackaging the existing canisters of commercial spent nuclear fuel. Obvious problems for direct disposal of existing spent nuclear fuel dry storage canisters are that the thin-walled welded-closed canisters were never designed for repository disposal and these canisters face serious corrosion issues within a shorter time frame than was stated for the TAD. [39] [40]

The commercial spent nuclear fuel canisters pose a number of challenges for repository disposal. The spent nuclear fuel dry storage canisters have been loaded with an increased number of spent fuel assemblies and canisters have gotten larger and heavier. There is a higher thermal load per canister, as well, due to the higher amount of decay heat. This requires more cooling time before being placed in a repository. Typical commercial spent nuclear fuel is less than 5 percent enriched and the higher enriched HALEU fuel will only add to the technical challenges, complexity and cost of spent nuclear fuel disposal. The greater variety of advanced reactor types and fuels and storage systems, the greater the complexity. This makes inadequate research, and

043-3 (cont'd)

[37] Department of Energy, *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, Office of Civilian Radioactive Waste Management, DOE/EIS-0250, February 2002. https://www.energy.gov/nepa/articles/eis-0250-final-environmental-impact-statement

[38] Department of Energy, Office of Nuclear Energy, Standardized Transportation, Aging, and Disposal (STAD) Canister Design, Presentation to the Nuclear Waste Technical Review Board, June 24, 2015. https://www.nwtrb.gov/meetings/past-meetings/summer-2015-board-meeting---june-24-2015 Both the earlier "TAD" and the later "STAD" are described in this presentation. None have actually been used. There are 189 bare fuel casks (10.4 percent of dry storage in 2015), 12 welded metal canisters in Holtec Hi-Star 100 transport overpacks (1.0 percent of dry storage in 2015), and 1,865 welded closed canisters (88.6 percent of dry storage in 2015. Of the 1865 canisters, 37 percent were Transnuclear, 41 percent were Holtec, and 20 percent were NAC.

[39] E. Hardin et al., *Summary of Investigations on Technical Feasibility of Direct Disposal of Dual-Purpose Canisters*, Prepared for the U.S. Department of Energy, FCRD-UFD-2015-000129, Rev. 1; SAND2015-8712R, May 2015.

[40] E. Hardin, "Dual-Purpose Canister Direct Disposal Technical Feasibility Evaluation: Introduction and Summary," Presentation at the Used Fuel Disposition Annual Working Group Meeting, Law Vegas, Nevada, June 11, 2015.

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mistakes from inadequate reviews more likely. The inherently most costly approach is to create chaos from the wide variety of advanced reactor fuels and the ever-present incentive to cut corners will result in inadequate professionals who understand the designs and the hazards. For example, a lot of waste drums had been packaged in Idaho at the Idaho Cleanup Project, but a unique waste stream resulted in four drums expelling their contents [41] in a way that could have done far more damage that it did. At the Waste Isolation Pilot Plant (WIPP), it was understood and a requirement that nitrates not be mixed with organic material – despite that, the Los Alamos National Lab packaged many drums with organic absorbent material and one exploded at WIIPP. The EIS must address the added burden of more spent nuclear fuel, the higher enrichment and especially, the wide variety of spent nuclear fuels from advanced nuclear reactors.

Disproportionately High Volumes of Repository Waste from Advanced Nuclear Projects Must Be Evaluated

The Department of Energy's push for advanced reactors and small modular reactors (SMRs) has been going on for over a decade and the SMRs can greatly exacerbate the needed repository size. **The small modular reactors will require disproportionately more containers and more space in a repository, according to independent evaluations.** The nuclear waste from the variety of small modular reactors (water-, molten-salt-, and sodium-cooled SMR designs) has been evaluated and can be expected to "increase the volume of nuclear waste in need of management and disposal by factors of 2 to 30" for each megawatt produced. [42]

The Department of Energy and its nuclear boosters like to say that spent fuel reprocessing is the answer to the nuclear waste problem. But they don't like to discuss the unaffordable cost, the high radiological emissions, or the increased overall volumes of radioactive waste associated with reprocessing.

The Bill Gates' TerraPower Natrium fast neutron reactor slated for Kemmerer, Wyoming, will require costly and polluting reprocessing due to the sodium-bonded fuel and will exacerbate weapons material proliferation risks. It will also take so long to deploy Natrium as to be irrelevant to combating climate change.

In March 2023, the Department of Energy proposed to increase nuclear energy electricity production in the U.S. by a factor of three. [43] The 2021 GAO report does not include the spent nuclear fuel from any new nuclear plants and the proposed use of nuclear reactors for purposes other than electricity generation. With more than 140,000 metric tons of commercial spent fuel that is more than double the current statutory limit for Yucca Mountain and the need for a DOE-

043-3 (cont'd)

[41] Idaho Cleanup Project Core, "Formal Cause Analysis for the ARP V (WFM-1617) Drum Event at the RWMC," October 2018. https://fluor-idaho.com/Portals/0/Documents/04_%20Community/8283498_RPT-1659.pdf

[42] Lindsay M. Krall, Allison M. Macfarlane, and Rodney C. Ewing, *PNAS*, "Nuclear waste from small modular reactors," Received June 26, 2021, Published May 31, 2022, https://doi.org/10.1073/pnas.2111833119.

[43] U.S. Department of Energy webpage, Pathways to Commercial Liftoff: Advanced Nuclear, March 2023. https://www.energy.gov/lpo/articles/sector-spotlight-advanced-nuclear DOE discusses deploying about 300 gigawatts (GW) by 2050, with current U.S. nuclear capacity of about 100 GW. See also the related COP28 announcement at https://www.energy.gov/articles/cop28-countries-launch-declaration-triple-nuclear-energy-capacity-2050-recognizing-key

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managed spent nuclear fuel and high-level waste repository, the promoted new nuclear energy would mean many more repositories the size and cost of a Yucca Mountain repository — that does not exist.

The reality is that the Yucca Mountain or any other repository is basically an experiment and one that when problems occur, is going to be even more expensive.

Spent nuclear fuel and high-level waste disposal are the foundation of the U.S. nuclear industry's spent nuclear fuel management promises. The Department of Energy has made reference to its repository program at Yucca Mountain in many of its Environmental Impact Statements. Despite this, the Department of Energy makes no progress toward a permanent solution for the radioactive waste, the spent nuclear fuel, that is poised to contaminate air, land and water for millennia. The Department of Energy seeks endless and expensive schemes to make more waste, as the work to attempt to figure out how to confine the waste for millennia languishes. Even the work to safely confine the waste for a few decades languishes.

The Current Lack of Adequate Technical Basis to Conclude SNF Storage is Safe Must Be Evaluated

The claim is made in the DOE's HALEU EIS that "SNF is being safely stored." By DOE's own experts, the safety of long-term storage of spent nuclear fuel currently **lacks adequate technical basis**. And the problem is compounded by the higher burnup fuels being used by commercial nuclear utilities.

The Department of Energy acknowledged the gaps in the technical basis for continued storage of spent nuclear fuel, first in 2012. [44] Then in 2019, an additional gap was identified that was the lack of technical basis for understanding what the radiological consequences of a spent nuclear fuel canister breach would be. [45] **Each new fuel type from the use of HALEU will require additional research regarding the storage and disposal of the fuel. The Department of Energy acknowledges that it is already behind in researching the technical basis for fuel already in storage.** [46]

In regard to what has been learned about spent nuclear fuel dry storage for existing light-water reactor spent nuclear fuel, vulnerability to material corrosion issues was learned late and existing SNF canisters will begin to fail. The timing of the canister failures will depend on specific spent fuel design, burnup, handling, dry storage system design, atmospheric chloride exposure, etc. The full impact of the currently inadequately designed spent nuclear fuel canisters we already have, is poised to be seen in the next few years and it may require evacuation of the public.

043-3 (cont'd)

[44] B. Hanson et al., *Gap Analysis to Support Extended Storage of Used Nuclear Fuel*, FCRD-USED-2011-000136, For the Department of Energy, January 2012.
[45] M. Teague et al., *Gap Analysis to Guide DOE R&D in Supporting Extended Storage and Transportation of Spent Nuclear Fuel: An FY2019 Assessment*, For the Department of Energy, SAND2019-15479R, 2019.
[46] Ned Larson, U.S. Department of Energy, Office of Nuclear Energy, "Back-end Management of Advanced Reactors (BEMAR)," U.S. Nuclear Waste Technical Review Board Public Meeting, Idaho Falls, Idaho, August 30, 2023.

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With regard to the various proposed advanced reactor fuels being proposed that would use HALEU (up to almost 20 percent enrichment), there is limited experience with TRISO fuels and sodium fuels. But that experience is with lower fuel burnup than is now being proposed and in a variety of ways, the existing experience just isn't adequate. The pattern continues to be repeated: design and build a variety of nuclear reactors and then as an after-thought, deal with storage and disposal issues as research about how to safely storage and dispose of spent nuclear fuel falls farther and farther behind.

Experience with TRISO fuels has shown that gases can leak from the fuels, moisture issues can compromise containers, and radioactive gases can be released to the environment. Continued storage of TRISO fuel is expensive (see the millions of dollars annually to continue to store Fort St. Vrain spent fuel in Idaho and Colorado).

Experience with fast reactor spent nuclear fuel repeats the pattern of the nuclear industry to design inadequate spent nuclear fuel storage. The inadequacy the spent nuclear fuel storage designs is only revealed over time. At the Idaho National Laboratory, EBR-II fuel was placed in a spent fuel pool inside container systems. Over time and unexpectedly, these containers leaked. Also, the water chemistry of the pool was not maintained in order to protect the containers (or their contents). The spent fuel from the EBR-II is sodium-bonded and the sodium creates additional hazards. Any moisture that contacts metal uranium fuel, moisture and oxygen are expected to react with sodium, producing Na_2O, NaOH, and hydrogen. Moisture and O_2 also may react with uranium metal, forming uranium oxides and pyrophoric hydrides. Pyroprocessing to remove the sodium is a slow and expensive process and also releases extensive airborne radiological contamination. [47] [48]

The INL's radiological releases to the environment are already increasing by a factor of more than 170, for its HALEU processing at the Materials and Fuels Complex, see Table 1.

043-3 (cont'd)

[47] Nathan Hall et al., Center for Nuclear Waste Regulatory Analyses, San Antonio, Texas, *Potential Challenges with Storage of Spent (Irradiated) Advanced Reactor Fuel Types*, Prepared for the U.S. Nuclear Regulatory Commission, August 2019. https://www.nrc.gov/docs/ML2002/ML20022A217.pdf

[48] Nathan Hall et al., Center for Nuclear Waste Regulatory Analyses, San Antonio, Texas, *Storage Experience with Spent (Irradiated) Advanced Reactor Fuel Types*, Prepared for the U.S. Nuclear Regulatory Commission, April 2019. ML20211L885 https://www.nrc.gov/docs/ML2021/ML20211L885.pdf

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Table 1. Estimated annual air pathway dose (mrem) from normal operations to the maximally exposed offsite individual from proposed projects, adapted from the estimated dose from expanding capabilities at the Ranges based on DOE/EA-2063.

Current and Reasonably Foreseeable Future Action	Estimated Annual Air Pathway Dose (mrem)
National Security Test Range	0.04[c]
Radiological Response Training Range (North Test Range)	0.048[d]
Radiological Response Training Range (South Test Range)	0.00034[a]
HALEU Fuel Production (DOE-ID, 2019)	1.6[a]
Integrated Waste Treatment Unit (ICP/EXT-05-01116)	0.0746[h]
New DOE Remote-Handled LLW Disposal Facility (DOE/ID 2018)	0.0074[a]
Recapitalization of Infrastructure Supporting Naval Spent Nuclear Fuel Handling (DOE/EIS 2016)	0.0006[c]
TREAT (DOE/EA 2014)	0.0011[a]
DOE Idaho Spent Fuel Facility (NRC, 2004)	0.000063[a]
Plutonium-238 Production for Radioisotope Power Systems (DOE/EIS 2013)	0.00000026[b]
Total of Reasonably Foreseeable Future Actions on the INL Site	1.77[g]
Current (2018) Annual Estimated INL Emissions (DOE2019a)	0.0102[f]
Total of Current and Reasonably Foreseeable Future Actions on the INL Site [**DOE WOULD INCREASE INL'S AIRBORNE RELEASES BY OVER 170 TIMES**]	1.78[g]

Table notes:

a. Dose calculated at Frenchman's Cabin, typically INL's MEI for annual NESHAP evaluation.
b. Receptor location is not clear. Conservatively assumed at Frenchman's Cabin.
c. Dose calculated at INL boundary northwest of Naval Reactor Facility. Dose at Frenchman' Cabin likely much lower.
d. Dose calculated at INL boundary northeast of Specific Manufacturing Capability. Dose at Frenchman's Cabin likely much lower.
e. Sum of doses from New Explosive Test Area and Radiological Training Pad calculated at separate locations northeast of MFC near Mud Lake. **Dose at Frenchman's Cabin likely much lower. PLEASE NOTE THAT THE PUBLIC AT MUD LAKE IS CLOSER TO THE RELEASE THAN TO FRENCHMAN'S CABIN.**
f. Dose at MEI location (Frenchman's Cabin) from 2018 INL emissions (DOE 2019a). The 10-year (2008 through 2017) average dose is 0.05 mrem/year. **PLEASE NOTE THAT MANY RADIOLOGICAL RELEASES ARE IGNORED AND NOT INCLUDED IN THE RELEASE ESTIMATES IN NESHAPS REPORTING.**
g. This total represents air impact from current and reasonably foreseeable future actions at INL. It conservatively assumes the dose from each facility was calculated at the same location (Frenchman's Cabin), which they were not.
h. Receptor location unknown.

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Known Consolidated Interim Storage Problems Must Be Disclosed and Must Be Evaluated

The Draft HALEU EIS cites the EISs for two proposed consolidated interim storage sites but fails to mention the many challenges each face. DOE must evaluate how incompatible those two proposed consolidated storage facilities are with the proposed advanced reactor spent fuels.

The Department of Energy's Draft Environmental Impact Statement for HALEU issued in March 2024 [49] (in both Volume 1 and Volume 2) lists the two proposed consolidated "interim" storage sites granted licenses by the NRC: Holtec International in Lea County, New Mexico and Interim Storage Partners, Andrews, Texas. [50] [51] **The DOE failed to mention that both New Mexico and Texas have passed bills prohibiting consolidated storage of spent nuclear fuel.** The DOE also failed to mention that the court in Texas found that NRC did not have the authority to authorize away-from-reactor consolidated storage because Congress made requirements in the Nuclear Waste Policy Act that the NRC ignored. The Environmental Impact Statements for those consolidated interim storage (CIS) facilities is limited to the NRC licensing period for those facilities, and what happens after the licenses expire and over time as spent nuclear fuel degrades and storage canisters are breached, is not evaluated. Thus, the Draft HALEU EIS citing these other CIS EISs that do not consider what happens after a perhaps 40-year NRC license for spent nuclear fuel storage expires should there be no repository to send the spent fuel to or the canisters are not safe to ship or the canisters begin to breach from corrosion. The lack of viable long-term consideration of human health and the environment of consolidated interim storage of spent nuclear fuel safety exemplifies the lacking consideration beyond more than perhaps a handful of years that is rampant throughout the Draft HALEU EIS.

The Department of Energy is promoting its consent-based siting of consolidated interim [forever] storage parking lot dumps without siting one or more geologic repositories. [52]

When the Department of Energy's Draft HALEU EIS ignores the status of new laws and court cases regarding the consolidated interim storage facilities proposed for New Mexico and Texas, it reveals a disregard for the law. DOE ignores the regulatory and court status of these two facilities because DOE wants to people have the mistaken impression that these two proposed CISs are a solution for spent nuclear fuel management.

043-3 (cont'd)

[49] U.S. Department of Energy, *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)*, DOE/EIS-0559, March 2024. https://www.energy.gov/ne/haleu-environmental-impact-statement Public comment is open until April 22, 2024 and comments may be sent to HALEU-EIS@nuclear.energy.gov

[50] U.S. Nuclear Regulatory Commission, *Federal Register*, Vol. 86, No. 178, "Interim Storage Partners, LLC; WCS Consolidated Interim Storage Facility; Issuance of Materials License and Record of Decision," September 17, 2021. This is the consolidated storage facility proposed for Andrews County, Texas. (The consolidated storage facility could store up to 40,000 metric tons heavy metal.)

[51] U.S. Nuclear Regulatory Commission, *Federal Register*, Vol. 88, No. 92, "Holtec International; HI-STORE Consolidated Interim Storage Facility," May 12, 2023. (The consolidated storage facility could store up to 100,000 metric tons heavy metal.)

[52] U.S. Department of Energy, Office of Nuclear Energy, *Consent-Based Siting Process for Federal Consolidated Interim Storage of Spent Nuclear Fuel*, April 2023.

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The Department of Energy admitted at the August 2023 NWTRB meeting that it planned to give information to the newly forming "consortia" of universities, businesses and others and that citizens would not have access to the information given to the consortia. **Importantly, the communities being bribed and connived into hosting "temporary" interim consolidated storage sites would NOT have access to the information shared with the consortia.** The Department of Energy's approach to siting consolidated interim storage was to proceed with no planning for obtaining a permanent geological repository or for obtaining reprocessing capability. The DOE understands the imperative to withhold the truth about the risks and health harm of storing spent nuclear fuel for unknown decades to come. **The DOE stated that it would use carefully filtered messaging in order to persuade the community's leaders.**

The DOE stated that consortia members will have ready access to DOE experts, special computerized tools and access to "unfiltered" information. **The non-tribal communities and tribes, it was stated, would not have access to DOE experts, special tools, or to "unfiltered" information.** The messaging and story-telling to attain siting that was most effective would be studied and applied by DOE.

043-3 (cont'd)

The Draft HALEU EIS in Table A-10 states that the impact of terrorism or sabotage on spent nuclear fuel storage would be SMALL. But this assessment is doubtful for even a small amount of spent nuclear fuel and it is incorrect for consolidated interim storage. The more spent nuclear fuel there is, the greater the risk of terrorism. Despite this, Price-Anderson Act liability coverage may not apply, depending on ownership, see Table 2.

The Nuclear Regulatory Commission has already been too lax concerning adequate licensing reviews and nuclear facility oversight. But with continued pressure on the NRC to further loosen reviews and oversight and speed up licensing, no EIS can assume any competent level of NRC licensing or regulatory oversight and this must also be considered in the Draft HALEU EIS and the cited EISs.

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Table 2. Requirements for financial protection and the availability of indemnification for NRC Part 50 licensees and DOE contractors.

Entity	Primary Tier Financial Protection	Secondary Tier Financial Protection	Indemnification
Large (>100 MWe) Operating Reactor: NRC Part 50 [Reactor] Operating Licensee (including SNF stored onsite at an ISFSI under an NRC Part 72 license)	$450 million provided through private insurance.	$13.21 billion provided through deferred premium payments from all operating licensees.	If the secondary tier financial protection is depleted, Congress is committed to review the incident, and take any actions determined to be necessary for fuel and prompt compensation of all public liability claims.
Permanently Shut down Reactor: NRC Part 50 Shutdown [Reactor] Plant Licensee Applicable to SONGS (including SNF stored onsite at an ISFSI under an NRC Part 72 license)	$100 million provided through private insurance.	No secondary tier required per PAA.	NRC indemnified licensee for an additional $460 million, for a total financial protection of $560 million. Beyond this amount, Congress is committed to review the incident, and take any actions determined to be necessary for full and prompt compensation of all public liability claims.
DOE Contractor (General)	As may be determined by the Secretary of Energy.	Not applicable.	DOE indemnifies contractor up to $13.70 billion total. Beyond this amount, Congress is committed to review the incident, and take any actions determined to be necessary for full and prompt compensation of all public liability claims.
DOE Contractor (Performing Activities Funded by the NWF)	As may be determined by the Secretary of Energy.	Not applicable.	Public liability claims are paid from the Nuclear Waste Fund, in an amount not to exceed $12.58 billion. Beyond this amount, Congress is committed to review the incident, and take any actions determined to be necessary for full and prompt compensation for all public liability claims.
NRC Part 72 Stand-Alone Independent Spent Fuel Storage Installation	As may be determined by the NRC and implemented through a site license condition.	Not applicable.	**$ 0, Zero dollars** NRC regulations do not provide NRC indemnification for 10 CFR Part 72 stand-alone ISFSIs. Such facilities do not have PAA protection available to them.

Table notes: Northwind, Volume II, *Strategic Plan for the Relocation of SONGS Spent Nuclear Fuel to an Offsite Storage Facility or a Repository*, March 15, 2021.

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https://www.songscommunity.com/strategic-plan-for-relocating-spent-fuel/spent-nuclear-fuel-solutions-a-fresh-approach See Appendix C, Table on page C-7. And see H. Arceneaux et al., U.S. Nuclear Regulatory Commission, *The Price-Anderson Act: 2021 Report to Congress – Public Liability Insurance and Indemnity Requirements for an Evolving Commercial Nuclear Industry*, NUREG/CR-7293, December 2021. https://www.nrc.gov/docs/ML2133/ML21335A064.pdf. Note that in the event there is no coverage, Congress could decide to provide coverage after an accident.

Communities Must Be Told How Many Years Spent Nuclear Fuel Will Remain at Stranded Fuel Sites, Consolidated Storage and the Newly Created Stranded Fuel Sites from Various Mobile-Micro and Small Reactors - and This Must Be Evaluated

How long does spent nuclear fuel (SNF) required to cool before it can be transported? And how long can SNF canister or other containers be expected to retain integrity due to aging and corrosion problems?

These are basic questions that DOE and NRC are avoiding. Communities currently with stranded spent nuclear fuel are not being told how many decades may have to pass before spent nuclear fuel can be transported, even if there is a place to transport the fuel to. And the possible need for Dry Storage Transfer facilities and who will pay for them, is not being discussed.

Because the DOE's Draft HALEU EIS is not providing realistic and known problems of SNF currently at stranded nuclear sites, DOE needs to be called out for its deception. The safety problems with long term storage of spent nuclear fuel is especially important as DOE is not making progress on a repository and probably never will. This is especially important as DOE seeks consolidated storage of spent nuclear fuel from a willing-to-be-bribed host community.

The DOE's Draft HALEU EIS is ignoring that it is promoting the creation of micro-mobile reactors and various small reactors that will create stranded spent nuclear fuel sites virtually every place they are used. There is no plan for where the spent fuel for these new reactors will go. These reactors can show up anywhere – next to hospitals, schools, farmland – and may never leave. The Draft HALEU EIS points to the NRC's 2014 generic EIS which assumes that Dry Transfer Systems magically pop up when needed but no one knows who will design and pay for it. The Draft HALEU EIS is clearly inadequate and must evaluate the current state of impending crisis with the need to repackage spent nuclear fuel and that absence of a repository program for any of the nation's spent nuclear fuel. That the Draft HALEU EIS does not even acknowledge that DOE has no idea how or where to dispose of the spent nuclear fuel the nation already has, does not excuse the Draft HALEU EIS from that way it has ignored that its HALEU production is seeking to make far more spent nuclear fuel and it may be fuel that requires far more space in a repository. TRISO-fueled high-temperature gas-cooled reactors, for example, will require far more space in a repository and there is no reason to expect TRISO fuel is practical to reprocess. The Natrium reactor spent fuel will likely require expensive and polluting pyroprocessing prior to disposal. So, the costs of nuclear energy, that currently focus on construction and operating costs while ignoring spent nuclear fuel management and disposition costs is completely untenable – and must be evaluated in the HALEU EIS.

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The spent nuclear fuel from traditional light-water reactors (pressurized water reactors and boiling water reactors) is transferred to a spent fuel pool after use in a reactor. The fuel cools and after adequate cooling, may be transferred to dry storage in either a cask or canister. Additional time to allow cooling of the fuel from the reduction of radioactive decay-generated heat may be needed before the fuel can be transported, depending on canister and the number of assemblies in the canister. The cooling time needed also depends on the initial fuel enrichment in uranium-235 and on the operating time in the reactor because longer operating time in the reactor produces more fission products.

Higher initial fuel enrichment and higher fuel burnup in the reactor create a thermally hotter fuel because of more fission products. The cooling time needed before the fuel can be placed in dry storage depends on the dry storage system. The cooling time needed prior to transportation depends on the transportation packaging.

When the spent nuclear fuel burnup is below about 35 Gigawatt-Days/Metric-ton (GWD/MTU), the fuel required about 5 years of cooling in the spent fuel pool before it could be placed in dry storage. But by the year 2000, most of the U.S. spent nuclear fuel at PWRs and BWRs exceeded 35 GWD-MTU. Fuel burnup above 45 GWD/MTU is considered "high" and fuel burnup has been climbing to levels above 55 GWD/MTU. At burnups of 55 GWD/MTU, the fuel may require 30 years of cooling in a pool before it can be placed in dry storage.

A 2013 presentation by Sandia National Laboratories provides charts of needed cooling times and the time before spent nuclear fuel can be transported. Less information was provided about the cooling times needed for higher fuel burnups. [53]

With higher fuel burnups, radioactively and thermally hotter fuels have been placed in dry storage and there may be decades of cooling in dry storage needed before the fuel, as packaged in canisters, could meet transportation requirements. **The length of time needed before high burnup spent nuclear fuel may need to cool before allowed for transportation may decades, over 40 years.** So, some communities with reactors that operated after about year 2000 who are hoping that consolidated interim storage means fuel will be leaving their community may be surprised to learn how long cooling may be required before the high burnup spent nuclear fuel could be transported.

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For some casks or canisters, transportation licensing of the container was never obtained. There are 74 sites with spent nuclear fuel. As an example, at 12 shutdown plant sites, 17 different canister designs were used, 8 different storage overpack designs and 8 different transport overpack designs. [54] Not all dry storage systems were designed and licensed for transportation and so there are licensing challenges. If a cask or canister cannot be licensed for transportation, it

043-7 (cont'd)

[53] Christine Stockman and Elena Kalinina, Sandia National Laboratories, For the Department of Energy's National Nuclear Security Administration, *Cooling Times for Storage and Transportation of Spent Nuclear Fuel*, SAND2013-1698C, February 25, 2013.

[54] Jeffery Williams, U.S. Department of Energy, "Nuclear Fuels Storage and Transportation Planning Project," U.S. Nuclear Waste Technical Review Board Workshop, November 18-19, 2013.

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would have to be repackaged. But the spent fuel pool may be gone and there is then a need for a Dry Transfer System but one hasn't been designed or built.

There's yet another problem regarding transportation of spent nuclear fuel. While higher enriched fuels that allowed higher fuel burnup were used, some of the spent fuel characteristics placed in the canisters may not meet existing transportation Certificate of Compliance requirements pertaining to 10 CFR 71 transportation requirements. (See Williams, 2013)

Existing requirements for transportation have not been met as the utilities loaded the spent fuel into the canisters, despite the canister having a transportation license. For example, higher initial uranium-235 enrichment, coupled with low operating time in the reactor means higher reactivity of the fuel. This means increased ability for a criticality and larger criticality power excursion event should water enter the canister. One limited study found that half of the canisters had been loaded with spent fuel with a combination of conditions that increases criticality risk: high initial enrichment and low burnup in the reactor. The canisters were loaded with spent nuclear fuel that did not meet the required conditions for the Certificate of Compliance for the canister. [55] What were these utilities thinking?

The 2019 NWTRB report found that "For an unknown but significant number of commercial SNF storage cask and canister types that are already approved for transportation, the CoCs for transporting the casks and canisters must be amended and NRC-approved to broaden the scope of allowable contents (e.g., a wider range of fuel types, higher initial enrichments, and higher fuel assembly burnups)." The implications, according to the NWTRB, are that unless the Certificate of Compliance for transportation can provide a technical case that supports the safe transportation of the SNF and gain NRC approval for its transportation, or be granted an exemption by NRC from some of the transportation requirements, the SNF would have to be removed from the welded canisters and repackaged into canisters or bare fuel casks that are approved by the NRC for transportation. [56]

In its 2024 report, the NWTRB [57] again noted that "some loaded DPCs [dual-storage canisters] currently in storage are known to include contents [spent nuclear fuel] that do not meet the requirements of the associated Certificate of Compliance for transportation." The Board recommended that "The implications (time, effort, and cost) of identifying and finding a resolution for commercial SNF canisters approved by the NRC for storage, but which include

043-7 (cont'd)

[55] U.S. Nuclear Waste Technical Review Board, *Preparing for Nuclear Waste Transportation – Technical Issues that Need to be Addressed in Preparing for a Nationwide Effort to Transport Spent Nuclear Fuel and High-Level Radioactive Waste*, A Report to the U.S. Congress and the Secretary of Energy, September 2019. See Figure A-1.

[56] U.S. Nuclear Waste Technical Review Board, *Preparing for Nuclear Waste Transportation – Technical Issues that Need to be Addressed in Preparing for a Nationwide Effort to Transport Spent Nuclear Fuel and High-Level Radioactive Waste*, A Report to the U.S. Congress and the Secretary of Energy, September 2019. See page 15.

[57] U.S. Nuclear Waste Technical Review Board, *Evaluation of the U.S. Department of Energy Research and Development Activities on the Disposition of Commercial Spent Nuclear Fuel in Dual-Purpose Canisters*, February 2024. https://www.nwtrb.gov/our-work/reports/evaluation-of-the-u.s.-department-of-energy-research-and-development-activities-on-the-disposition-of-commercial-spent-nuclear-fuel-in-dual-purpose-canisters-(february-2024)

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contents not currently approved by the NRC for transportation." The Board recommended that the Department of Energy give higher priority to the issue. The NRC had granted licenses of the higher burnup fuel, without consideration of added storage, transportation or disposal implications. The electricity utilities had loaded combinations of high spent fuel into canisters such that transportation CoCs were not complied with. So, now the NWTRB recommends that DOE should give that a higher priority to this problem. The U.S. Government Accountability Office reports DOE's rosy transportation and disposal cost estimates from the Department of Energy. There is massive dysfunction throughout the nuclear enterprise in the U.S., from the Department of Energy, the Nuclear Regulatory Commission, and it also includes the agencies Congress relies on for getting information from, including the U.S. Nuclear Waste Technical Review Board and the U.S. Government Accountability Office.

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If the U.S. Congress actually had a clue as the already built-in costs of spent nuclear fuel management and disposal in this country, there is no way it would giving out more taxpayer money to make more and more liabilities.

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Uranium Fuel Cycle Activities That Create Numerous Contaminated Sites Must Be Evaluated (And the EIS Must Admit How Many Become Forever Contaminated)

Countless radiologically contaminated sites have been created from uranium fuel cycle activities and often involving the Department of Energy (or its predecessor, the Atomic Energy Commission). The cleanup of these sites is recognized as costing hundreds of billions of dollars over several decades. [58] Despite the cost, many sites never attempt to conduct cleanup to Environmental Protection Agency (EPA) CERCLA cleanup standards – it would simply cost too much. Instead, fences are put around waste sites, rocks are placed over buried waste and the cleanup is deemed acceptable only as long as no one lives at the contaminated site, basically, forever. [59] The characterization of the radionuclide contamination that remains and the length of time that the land remains unsafe to live on or grow food on, is deliberately obscured, as cleanup efforts are deemed completed. The Department of Energy Environmental Management program over about 100 "EM sites" may call a cleanup complete by simply acknowledging that it would be too costly to clean up an area, and therefore, simply deem the cleanup complete by assuming no one ever lives there in the future. (See a map of nationwide EM sites in Idaho Cleanup Project

043-9

[58] National Academies of Sciences, Engineering, and Medicine, *Leveraging Advances in Modern Science to Revitalize Low-Dose Radiation Research in the United States*, Washington, DC: The National Academies Press, 2022. http://nap.nationalacademies.org/26434 or https://doi.org/10.17226/26434. On page 93 it is admitted that cleanup costs are expected to cost billions of dollars over several decades. However this report implies that cleanup standards can be met yet does not actually disclose how often these are not met. The report implies that loosening the cleanup standards is the way to save money but the reality is that often, no attempt is made to meet existing cleanup standards. The NAS report is an example of why even NAS has a pervasive, unstated and biased leaning to aid the nuclear industry as it withholds information about the truth regarding cost, public health and the environment.

[59] Tami Thatcher, Environmental Defense Institute Special Report, "The "Forever" Contamination Sites at the Idaho National Laboratory," 2017. www.environmental-defense-institute.org/publications/EarthDayINLreport.pdf

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Citizens Advisory Board, presentation by the Department of Energy, "EM Corporate Transuranic (TRU) Strategy," February 22, 2024.)

The Department of Energy has been able to disown some of its contaminated sites by shifting them to other agencies like the Army Corp of Engineers, like the Westlake Landfill in Missouri. The U.S. Environmental Protection Agency has often reassured residents of the safety near the neighborhoods still affected by uranium fuel cycle activities from decades ago. The Department of Energy passed the problem over to the Army Corp of Engineers, who started shipping the contaminated soil know as Formerly Utilized Sites Remedial Action Program (FUSRAP) to the US Ecology Idaho facility.

In June 2018, the Agency for Toxic Substances and Disease Registry (ATSDR), the federal public health agency of the U.S. Department of Health and Human Services, published a report evaluating the exposures to people living near Coldwater Creek where uranium processing wastes were improperly stored and disposed of in St. Louis, Missouri. [60] The radioactive contamination included uranium-238 and higher amounts of thorium-230 and its daughter product radium-226 than from unprocessed uranium ore because of the uranium extraction processing.

The ATSDR agency found that the Army Corps of Engineers' Formerly Utilized Site Remedial Action Program (FUSRAP) has been characterizing and cleaning up contaminated area since 1998. But soil concentrations of radiological contaminants still remain higher than remedial goals. Background levels of thorium-230 should have been about 1 to 3 picocuries/gram (pCi/g) but were frequently detected above FUSRAP's remedial goal of 14-15 pCi/g. Thorium-230 levels have been as high as 54.5 pCi/g and recently as high as 27.3 pCi/g.

The ATSDR concluded that there was not enough sampling data to actually evaluate pathways of exposure.

The Missouri Department of Health (MDOH), now known as the Missouri Department of Health and Senior Services (MDHSS) had reviewed cancer incidence and mortality data from August 1984 to September 1988 around several sites, but at that time did not calculate the observed and expected cancer rates because about 15 percent of hospitals were not yet in compliance with new cancer reporting laws. Subsequently, in a later review, MDOH concluded that radiation induction could not be ruled out. Then in March 2013, MDHSS reviewed 1996-2004 cancer incidence data from six ZIP codes adjacent to Coldwater Creek and **they found statistically significantly elevated rates of incidence of several types of cancer** including female breast, colon, prostate, and kidney cancer, compared to the Missouri state rates. Then an updated analysis **found that childhood brain and other nervous system cancers were statistically significantly elevated** compared to the Missouri state rates. And they found that the

043-9 (cont'd)

[60] Agency for Toxic Substances and Disease Registry, Public Health Assessment for Evaluation of Community Exposures Related to Coldwater Creek St Louis Airport/Hazelwood Interim Storage Site (HISS)/Futura Coatings NPL Site North St Louis County Missouri, EPA Facility ID MOD980633176, June 18, 2018. https://www.atsdr.cdc.gov/sites/coldwater_creek/docs/ColdwaterCreek-508.pdf

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incidence of leukemia, female breast, colon, kidney, and bladder cancer were statistically significantly elevated compared to the Missouri state rates.

It is interesting to note that the Center for Disease Control's National Program of Cancer Registries provide cancer statistics only on a state-wide basis since 1994 and not on a county basis, making contamination areas nearly impossible to trend by readily available cancer data in the U.S. available to the public. (See https://www.cdc.gov/cancer/npcr/public-use/index.htm).

In light of the elevated cancer rates, the ATSDR then applied radiation health models based on the International Commission of Radiological Protection (ICRP) that are known to underestimate the health risk. Combined with inadequate monitoring of the radiation levels, it is almost a miracle that ATSDR concluded that the elevated cancers *COULD* have been caused by the radioactive contamination.

The ATSDR folks don't seem to know that their radiation models are inadequate especially for inhaled and ingested radionuclides and underestimate the cancer risk by a factor of 100 or more. It is amazing that the ATSDR didn't state that the cancers could not have been caused by the radiation, as it so often case because of the understated harm from official radiation health modeling. For more about the inadequacy of radiation health harm estimates as currently estimated in the U.S., see our Environmental Defense Institute newsletter article from September, "Just Two Problems with U.S. Radiation Protection: Radiation Dose Underestimated and the Harm Underestimated." [61]

The entire charade by the U.S. agencies from the Department of Energy, to the Environmental Protection Agency, to ATSDR would be hilarious if it were not so much illness and so many lives lost.

Let's recap the uranium fuel cycle debacle around St Louis: The Department of Energy (formerly known as the Atomic Energy Commission) processed uranium and the waste was improperly stored and disposed of and for decades. No federal or state agency saw to it that proper monitoring was conducted, even after citizens were begging them to address the issue. Elevated cancers are happening but denied for years. Elevated cancer rates are now recognized by the state of Missouri. And ATSDR applied their inadequate radiation model with inadequate data and actually says the elevated cancer rates *COULD* have been caused by the years of living with the radioactive contamination.

When it comes to uranium mining and milling, in some cases, like in Moab, Utah, mill tailings are being moved from a very dangerous site to a less dangerous site, as great expense. But in general, little progress has been made in cleaning up uranium mines and mill tailings sites. "The site remediation costs have exceeded costs originally envisioned by Congress, the agencies, and the licensees due to an evolving understanding of the complexities and risks posed by

043-9 (cont'd)

[61] Environmental Defense Institute September 2018 newsletter article by Tami Thatcher "Just Two Problems with U.S. Radiation Protection: Radiation Dose Underestimated and the Harm Underestimated" at http://environmental-defense-institute.org/publications/News.18.September.pdf

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unintended releases of contaminants from uranium mill tailings." [62] Replace the words uranium mill tailings, as needed for every activity associated with the uranium fuel cycle, and the same statement can be applied to every activity being proposed by the Department of Energy in its Draft HALEU EIS. These are either already forever contamination sites or are destined to become a forever contamination site.

"Cleanup" typically means take care of some of the most egregious wastes left unattended — and cover them up or shift the waste to another location. In Idaho, radioactive waste that includes all types of radioactive waste including plutonium, is accepted for disposal at a facility near Boise on the western side of the state that is not even a radioactive waste landfill. That landfill started by accepting radioactively contaminated soils from uranium fuel cycle activities (FUSRAP soils) and expanded from there. Acceptance criteria are extremely flexible and monitoring is extremely lax when the State's leaders want it that way. On the eastern side of the state, the Idaho National Laboratory continues ramping up its airborne radiological emissions. Does Idaho care about the health of its children? Not so much. And can you guess what score Idaho earns for reporting of birth defects? You guessed it. Grade F. [63]

Bankrupt companies leave the uranium mines and mill tailings waste behind even if the U.S. Nuclear Regulatory Commission licensed it and the new owner becomes the Department of Energy, funded by U.S. taxpayers. Remediation is an optimistic term applied to what will never return damaged landscape to a healthy environment. For example, the movement of uranium mill tailings away from the Colorado River near Moab, Utah required the Department of Energy to take ownership of the site and a nearly billion-dollar effort to move the toxic tailings. [64]

"Mining and milling operations have disproportionately affected indigenous populations around the globe. For example, in the U.S. nearly one-third of all mill tailings from abandoned mill operations are on the lands of the Navajo nation alone." [65]

Uranium enrichment is the process of increasing the amount of U-235 to a higher proportion than is naturally present. Nuclear power plants typically use 3 to 5 percent enrichment. Weapons, some research reactors, and U.S. naval reactors use "highly enriched uranium" (HEU) with over 90 percent U-235. Most enrichment techniques require that uranium first be put in the chemical form uranium hexafluoride (UF_6).

[62] Congressional Research Service, Prepared for Members and Committees of Congress, *Long-Term Federal Management of Uranium Mill Tailings: Background and Issues for Congress*, R45880, February 22, 2021.

[63] Trust for America's Health, *Birth Defects Tracking and Prevention; Too Many States Are Not Making the Grade*, 2002. https://collections.nlm.nih.gov/catalog/nlm:nlmuid-101143813-pdf And it should come as no surprise that Idaho rates a grade "F" for tracking and prevention of birth defects because elevated rates of birth defects can be expected with increasing environmental radiological contamination.

[64] US Department of Energy, Factsheet "Overview of Moab [Uranium Mill Tailings Remedial Action] UMTRA Project," 2017. http://www.gjem.energy.gov/moab/documents/factsheets/20170316OVERVIEW.pdf See also *Citizens Monitoring and Technical Assessment Fund,* "A Short History of the Moab Project and The White Mesa Mill Alternative," http://www2.clarku.edu/mtafund/prodlib/dine/round5/Short_History.pdf

[65] Arjun Makhijani and Scott Sleska, *The Nuclear Power Deception – U.S. Nuclear Mythology from Electricity "Too Cheap to meter" to "Inherently Safe" Reactors*, 1999, by the Institute for Energy and Environmental Research, The Apex Press, ISBN 0-945257-75-9.

043-9 (cont'd)

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According to the Government Accountability Office, "Cleaning up 3 plants where uranium was enriched will cost billions of dollars and span decades. These sites – near Oak Ridge, Tennessee, Paducah, Kentucky; and Portsmouth, Ohio [actually near Piketon, Ohio] – are contaminated with radioactive and hazardous materials. [66]

A major hazard in uranium enrichment processes comes from the chemically toxic and radioactive uranium hexafluoride. The enrichment process creates waste in the form of depleted uranium that is still radioactive but has less U-235 than natural uranium. While there are some military uses for depleted uranium for tank armor plating and armor-piercing conventional weapons, the disposal of large amounts of depleted uranium poses a long-lived radioactive waste stream that requires isolation from groundwater and the environment. Regulations for depleted uranium disposal are not assuring protection of the environment. Future generations will likely face significant risks from uranium mining, milling, and processing activities. Former generations have already been given cancer and other illnesses at site related to uranium fuel cycle activities, whether in Ohio's Portsmouth site, Missouri's Westlake Landfill, and countless other sites. The historical contamination, remaining contamination, the illnesses and cost of attempted cleanup is obscured in terse, colorful and sanitized factsheets by the Department of Energy (see https://www.energy.gov/environmental-cleanup) and see federal superfund sites on the ever-evolving U.S. Environmental Protection Agency website.

I note that the Portsmouth uranium enrichment plant continued to use hexavalent chromium until the early 1990s as a corrosion inhibitor. [67] The use of hexavalent chromium at the Department of Energy site in Idaho was stopped by 1982, after extensive groundwater contamination. Hexavalent chromium damages DNA and children would be vulnerable and even more vulnerable if the parent had been exposed. Chemical and radiological exposures may need to be considered in light of increasing cancer and infant mortality rates in Pike County. [68] Throughout the uranium fuel cycle, the deaths stack up but the reason often is not acknowledged.

043-9 (cont'd)

Cited DOE or NRC EISs Do not Provide a Sound Basis for Safety or Project Viability

Many, if not all, of DOE's and NRC's EISs contain enormous technical flaws. These flaws typically do not get formally revealed, like the DOE's Yucca Mountain EIS that contained flawed analysis of the longevity of spent nuclear fuel casks and canisters as lasting over 1100 years. In reality, there isn't data to conclude the canisters last even 80 years.

043-3 (cont'd)

[66] U.S. Government Accountability Office, *NUCLEAR CLEANUP Actions Needed to Improve Cleanup Efforts at DOE's Three Former Gaseous Diffusion Plants*, GAO-20-63, December 2019. https://www.gao.gov/products/gao-20-6

[67] Fluor-BWXT Portsmouth, LLC, *U.S. Department of Energy Portsmouth Gaseous Diffusion Plant Annual Site Environmental Report - 2020, Piketon, Ohio*, DOE/PPPO/03-1034&D1, September 2021.

[68] Joseph J. Mangano, Radiation and Public Health Project, *Mortality/Morbidity Study, 7 Counties Downwind of the Portsmouth Nuclear Site*, May 12, 2023. https://docs.google.com/viewer?url=https://local12.com/resources/pdf/fb76de1b-2b63-4f6f-a44a-89e64b25ae4e-Portsmouth2ndreportfinal002002.pdf&embedded=true

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While the DOE was well aware of chlorides in the atmosphere and acknowledged that fact in 2002, the DOE ignored the chloride-induced stress corrosion cracking mechanism in the stainless steel of spent nuclear fuel dry storage canisters. [69] The spent nuclear fuel that was packaged for dry storage, was placed in a variety of dry storage systems, but prevalently, was placed in thin-walled welded-closed stainless steel canisters, usually 0.5 inch thick. The canisters are placed in concrete vaults but they have continuous natural circulation of atmospheric air to cool the canister and are exposed to atmospheric chlorides during storage.

The dry storage systems used by the commercial nuclear power industry were licensed by the U.S. Nuclear Regulatory Commission, initially for twenty years. Canister aging mechanisms were ignored as the licensing was granted beginning in the late 1980s and only in 2012 did the NRC formally acknowledge that the stainless-steel canisters were susceptible to stress corrosion cracking. [70] [71]

The theoretical time for chloride-induced stress corrosion cracking to proceed is dependent upon several factors unique to each individual spent nuclear fuel canister. There are variables include canister temperature, atmospheric humidity, atmospheric levels of chlorides from sea salt or magnesium chloride or other source, and canister metal wall thickness and metal stresses. [72] The canister temperature depends on how long the spent fuel aged prior to packaging, the length of time in dry storage as the decay heat falls, and on the fuel burnup which affects the decay heat initially and its trend over time. The need to predict how long it will take for chloride-induced stress corrosion cracking to initiate and then how long it will take for the cracking to compromise canister integrity has been recognized now for over a decade.

The U.S. Nuclear Regulatory Commission who licensed the dry storage systems, did so, without stating important corrosion mechanisms, without having any way to conduct meaningful corrosion or material degradation inspections, and without any way of repairing or repackaging a canister that was degraded or failed.

In 2002, the Department of Energy issued its wildly incorrect prediction that dry storage systems in use at commercial nuclear power plants would last for over 1100 years before

043-3 (cont'd)

[69] U.S. Department of Energy, *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, Office of Civilian Radioactive Waste Management, DOE/EIS-0250, February 2002. https://www.energy.gov/nepa/articles/eis-0250-final-environmental-impact-statement See Appendix K for the "Long-Term Radiological Impact Analysis for the No-Action Alternative."

[70] U.S. Nuclear Regulatory Commission, *Potential Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel and Maintenance of Dry Cask Storage System Canisters*, Information Notice 2012-20, 2012. https://www.nrc.gov/docs/ML1231/ML12319A440.pdf

[71] U. S. Nuclear Regulatory Commission, *Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel – Draft Report for Comment*, May 2012. ML120580143. This report contains tables ranking the level of knowledge and safety risk of spent nuclear fuel in storage and the dry storage systems. Stainless steel atmospheric stress corrosion cracking is acknowledged to have "low" level of knowledge and high research priority.

[72] G. Oberson et al., "U.S. NRC-Sponsored Research on Stress Corrosion Cracking Susceptibility of Dry Storage Canister Materials in Marine Environments – 13344." WM2013 Conference. February 24-28, 2013. Phoenix, Arizona.

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breaching. [73] That analysis as well as the NRC's licensing of dry storage spent nuclear fuel canisters had ignored **chloride-induced stress corrosion cracking, which can be initiated within weeks [74] and then can progress the metal degradation from partial-cracking to through-wall within about 20 to 40 years. [75]**

Concerning the safety of dry storage of spent nuclear fuel is the concept of repackaging the dry storage canisters (and in some cases, dry storage casks). The U.S. Nuclear Regulatory Commission assumed in its 2014 "continued storage" Environmental Impact Statement that Dry Transfer Stations would appear when and where needed. [76] But it has never been stated who would pay for these systems and so far, no system has been designed.

Following over a decade since the problem of stress corrosion cracking was formally identified, the status of stress corrosion research can be summed up in a Sandia National Laboratories report from 2021 and related 2022 presentation: [77] [78] they are still studying the problem and have yet to provide an estimated time for damage to spent nuclear fuel dry storage canisters.

Stress corrosion cracking through stainless steel can include multiple cracks progressing through the metal, leaving a rotted metal canister and breaching the canister. The welds on the canister are particularly susceptible, and there are welds around each end and in multiple long welds along the length of the canister. Canisters are filled with helium before closure. A breach will let the helium out and air (oxygen) in. Oxygen entry to the canister may accelerate spent nuclear fuel degradation. The more compromised the fuel cladding, the more that oxygen ingress may degrade the fuel.

043-3 (cont'd)

[73] U.S. Department of Energy, *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, Office of Civilian Radioactive Waste Management, DOE/EIS-0250, February 2002. https://www.energy.gov/nepa/articles/eis-0250-final-environmental-impact-statement See Appendix K for the "Long-Term Radiological Impact Analysis for the No-Action Alternative."

[74] U.S. Nuclear Regulatory Commission, *Atmospheric Stress Corrosion Cracking Susceptibility of Welded and Unwelded 304, 304L, and 316L Austenitic Stainless Steels Commonly Used for Dry Cask Storage Containers Exposed to Marine Environments*, NUREG/CR-7030, October 2010. This report estimated that the onset of stress corrosion cracking, under ideal conditions, would be expected to take between 32 and 128 weeks. But this estimate does not take into account the operating history of the dry storage cask or canister and the local environment at each location.

[75] Electric Power Research Institute (EPRI), *Flaw Growth and Flaw Tolerance Assessment for Dry Cask Storage Canisters*, 3002002785, October 2014. https://www.epri.com/research/products/000000003002002785 Figures 3-9 and 3-10, Crack depth vs. Time for two dry storage locations gave the prediction of 20 to 40 years for 100 percent crack depth.

[76] U.S. Nuclear Regulatory Commission, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel*, NUREG-2157, September 2014. https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2157/index.html

[77] C. Bryan et al., *FY21 Status Report: SNF Interim Storage Canister Corrosion and Surface Environment Investigations*, M2SF-21SN010207056/SAND21-12903 R. Albuquerque, New Mexico: Sandia National Laboratories, September 2021. https://www.osti.gov/biblio/1825847

[78] C. Bryan et al., "Stress Corrosion Cracking Research at Sandia National Labs," Electric Power Research Institute (EPRI) Extended Stroage Collaboration Program (ESCP) Winter 2022 Meeting, Charlotte, South Caroline, November 7-10, 2022. (Presentation found at NWTRB website for 2022 meetings.)

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According to the NWTRB 2010 report, "a breach of the main canister may allow the release of radioactive material. Fuel previously oxidized to the U_3O_8 form 'is a fine powder that spalls from the fuel surface. The release of fines and/or fuel relocation from the split cladding must be evaluated if U_3O_8 formation is suspected. The extent of oxidation of irradiated UO_2 is a time and temperature-dependent phenomenon.'" [79]

Zirconium, plutonium and uranium are known to be pyrophoric. For example, uranium in the form of fine powder may be pyrophoric. [80]

A survey of the previous studies and research needs conducted by EPRI in 2017 [81] states that "The potential consequences associated with unmitigated CISCC [chloride induced stress corrosion cracking] of canisters have not been specifically analyzed." The EPRI review stated that: "Additional analysis may be required to determine bounding values of residual water content, burnup, heat load at start of storage, and storage duration prior to air ingress for which the potential for fuel oxidation and flammable hydrogen concentration can be eliminated as a concern, thereby avoiding the need to consider them as part of a consequence evaluation."

The Department of Energy merely acknowledges even in 2022 that the consequences of canister breach remain uncertain and are still being studied. [82]

The NWTRB's 2024 report acknowledges that the NRC's regulations concerning dry storage of spent nuclear fuel do not currently address storage for extended periods. [83] Neither the Department of Energy nor the Nuclear Regulatory Commission have been willing to provide an estimate of the period of time it will take for partial- or through-wall canister metal corrosion such as from chloride-induced stress corrosion cracking which is known to be applicable to spent nuclear fuel dry storage canisters. Previous studies have indicated that stress corrosion cracking may cause through-wall cracking of the roughly 0.5-inch-thick stainless-steel

043-3 (cont'd)

[79] U.S. Nuclear Waste Technical Review Board (NWTRB), *Evaluation of the Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel*, Arlington, Virginia, December 2010. This is a useful report generally, but its criticality discussion is inadequate, particularly for high burnup fuels used in light-water reactors since about 1999.

[80] T. C. Totemeier, Argonne National Laboratory, *A review of the corrosion and pyrophoricity behavior of uranium and plutonium*, ANL-ED-95-2, June 1, 1995. https://www.osti.gov/biblio/97298

[81] S. Chu, EPRI Project Manager, The Electric Power Research Institute (EPRI), *Dry Cask Storage Welded Stainless Steel Canister Breach Consequence Analysis Scoping Study*, Technical Update, 3002008192, November 2017.)

[82] C. Bryan et al., "Stress Corrosion Cracking Research at Sandia National Labs," Electric Power Research Institute (EPRI) Extended Stroage Collaboration Program (ESCP) Winter 2022 Meeting, Charlotte, South Caroline, November 7-10, 2022. (Presentation found at NWTRB website for 2022 meetings.)

[83] U.S. Nuclear Waste Technical Review Board, *Evaluation of the U.S. Department of Energy Research and Development Activities on the Disposition of Commercial Spent Nuclear Fuel in Dual-Purpose Canisters*, February 2024. https://www.nwtrb.gov/our-work/reports/evaluation-of-the-u.s.-department-of-energy-research-and-development-activities-on-the-disposition-of-commercial-spent-nuclear-fuel-in-dual-purpose-canisters-(february-2024)

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canisters of spent nuclear fuel within as little as two or three decades after being loaded. [84] [85] No technical valid analysis is being provided that supports that the canisters are safe for 80 years, let alone after 80 years.

043-3 (cont'd)

When DOE is promoting advanced nuclear reactors or HALEU fuel, the Department of Energy behaves as though cost is of no concern. When maintaining nuclear facilities in order to protect workers and the public is needed in order to meet DOE's own regulations, then the DOE uses cost as the excuse for continuing unsafe operations. When cleanup is needed, the DOE uses cost as the reason why the many sites will forever be too contaminated to live at. The cleanup that is supposed to be conducted, like taking care of leaking chemically and radiologically high-level waste in tanks at the DOE's Hanford site since the 1940s, the DOE fails to protect workers, the public and the environment. And despite having an Environmental Impact Statement for vitrifying the liquid waste at Hanford, after twenty years of attempting to build a vitrification plant, there still is no vitrification plant and the DOE continues adding liquid radioactive waste to the tanks.

043-6 (cont'd)

In Idaho, despite having an Environmental Impact Statement and Record of Decision for the high-level waste called calcine, the DOE now states that the previously selected treatment is not technically mature and that they will do more research and that leaving the waste over the Snake River Plain aquifer remains an option.

At every Department of Energy site, including the Idaho National Laboratory, Hanford, Savannah River Site, and Oak Ridge National Laboratory, there are EISs claiming that the spent nuclear fuel and the high-level waste at those sites will go to DOE's repository at Yucca Mountain. But there is no Yucca Mountain repository and there is no program to site, license, build or operate a repository and now additional repositories are needed.

043-3 (cont'd)

The Department of Energy's Environmental Impact Statements have historically been riddled with assumptions that were speculative and lacked adequate technical basis. There does not appear to be a learning curve even within the last approximately 20 years because the DOE's Yucca Mountain EIS, the Idaho calcine EIS and other EISs are typically inadequate. That this Draft HALEU EIS lists a variety of EISs does not provide proof of safety or of technical adequacy. Anyone who knows what is actually in those EISs and what the actual status is, takes no reassurance for the list of EISs in the Draft HALEU EIS.

[84] U.S. Nuclear Regulatory Commission, *Atmospheric Stress Corrosion Cracking Susceptibility of Welded and Unwelded 304, 304L, and 316L Austenitic Stainless Steels Commonly Used for Dry Cask Storage Containers Exposed to Marine Environments*, NUREG/CR-7030, October 2010. This report estimated that the onset of stress corrosion cracking, under ideal conditions, would be expected to take between 32 and 128 weeks. But this estimate does not take into account the operating history of the dry storage cask or canister and the local environment at each location.

[85] Electric Power Research Institute (EPRI), *Flaw Growth and Flaw Tolerance Assessment for Dry Cask Storage Canisters*, 3002002785, October 2014. https://www.epri.com/research/products/000000003002002785 Figures 3-9 and 3-10, Crack depth vs. Time for two dry storage locations gave the prediction of 20 to 40 years for 100 percent crack depth.

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The Portsmouth Site in Ohio was one location where uranium fuel cycle enrichment took place. The facility spread airborne radioactivity to its neighbors, including the local middle school. The radionuclides were not just from uranium. The reason for this was the introduction of contaminated uranium from reprocessing and a refusal by DOE to acknowledge the extensive contamination from the expanded variety of radionuclides. The DOE typically does not monitor for uranium, preferring to pretend that elevated levels of uranium and its decay progeny are "naturally occurring." But despite the neptunium and americium that are not part of the uranium decay series, the operations at Portsmouth addressed the problem in the DOE way - by the deliberate lack of meaningful radiological monitoring.

Naturally-occurring uranium includes only uranium-238, uranium-235 and also uranium-234. While Y-12 and Portsmouth Gaseous Diffusion Plant, an enrichment facility, expected to receive highly enriched uranium, meaning that there was more uranium-235 than uranium-238 than would be naturally occurring, it appears that neither Y-12 nor the Portsmouth personnel understood *the additional radionuclide contaminants* in the uranium product they were receiving. **The radiological contamination from Portsmouth is a recent example of the Department of Energy ignoring and spreading its radiological mess, unbeknownst to workers and the nearby public.**

The recycled uranium from the INL contained contaminants including plutonium, neptunium and technetium, as well as uranium-236. The extent of the contaminants depended on the type of fuel being reprocessed as well as the reprocessing methods used and all of the fuels included technetium-99 contamination.

As an example, the levels of contaminants in the recycled product from INTEC (or ICPP), the plutonium, neptunium and technetium, "were not recorded explicitly during ICPP operations from 1953 through 1992." [86]

It appears that much of this contamination was not monitored by the receiving facilities of Y-12 at Oak Ridge, Tennessee or the Portsmouth Gaseous Diffusion Plant in Ohio. The long radioactive half-lives of plutonium and technetium mean that soil and groundwater contamination have occurred.

Small amounts of naturally occurring thorium-232 decay to produce daughter progeny of thallium-208 with its high energy gamma emission. But there are various ways that excessive thallium-208 is produced from reactor or recycled fuels. For example, reactor-made uranium-236 and uranium-232 each decay to thallium-208, with its high energy gamma emission.

The thallium-208 emission is particularly problematic for processes or fuel fabrication that had not been designed to provide radiation shielding.

043-9 (cont'd)

[86] L.C. Lewis et al., Prepared for U.S. Department of Energy, Environmental Management, DOE Idaho Operations Office, *Idaho National Engineering and Environmental Laboratory Site Report on the Production and Use of Recycled Uranium*, INEEL/EXT-2000-00959, September 2000. https://www.osti.gov/servlets/purl/768760

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According to a 2015 U.S. Department of Energy Report to Congress, *Tritium and Enriched Uranium Management Plan Through 2060*, [87] the solvent extraction step in spent nuclear fuel reprocessing cannot remove the uranium-236. **The report also notes that the recovered enriched uranium product from reprocessing contains unacceptably high concentrations of undesirable isotope such as uranium-232 and uranium-236.** Furthermore, the uranium-236 as a contaminant in new fuel is a neutron absorber creating "off specification" fuel, thus would require the fuel to have higher uranium-235 enrichment and alter the performance characteristics of the fuel. The report acknowledges that the presence of these isotopes would increase the complexity and cost of fuel fabrication and reactor operations. **But as usual, proper monitoring didn't happen and workers and the public were not protected. The DOE simply assumed no one would notice the elevated radiological contamination.**

See Table 3 for radionuclide contaminants sent to Portsmouth from the Idaho National Laboratory. Other radiological contamination like americium-241 was also likely to have been sent to the Portsmouth enrichment plant, but plant managers and workers were not even told and the monitoring was deliberately inadequate.

The Portsmouth Gaseous Diffusion Plant in Pike County, Ohio had a cancer incidence in 2010-2019 that was 15 percent higher than the U.S, the highest rate of all 88 Ohio counties. In the 1950s and 1960s, Pike county's cancer mortality was 12 percent below the U.S., with the gap closing by 1993. In 2009-2020, the cancer death rate in Pike County exceeded the U.S. by about 50 percent for all age groups, except for persons over age 75. For 2017 to 2020, for persons age 0 to 74, the all-cause mortality in the county was 85 percent, nearly twice that of the U.S. [88]

No wonder the name of the Portsmouth Gaseous Diffusion Plant in Pike County, Ohio has been changed to the American Centrifuge Plant, LLC, a subsidiary of Centrus Energy Corporation. The shoddy operating and dumping practices of the Portsmouth plant has left contaminated groundwater plumes and excessive cancers to workers and the public, yet it was all conducted in accordance with government requirements and the promise of adequate monitoring.

Carefully worded documents deny that Portsmouth is the cause of cancer, all without a complete picture of the past contamination or the actual dose to humans, as if by design. [89] The U.S. Department of Health and Human Services writes as if there were no radiological releases from Portsmouth, during its operation or during cleanup, even though that is untrue. And the agency ignores the particle size, solubility and chemical form of contamination which would affect its harm in the human body. In fact, the radionuclide dose coefficients selected for the dose evaluation would likely grossly underestimate the actual harm for a variety of reasons and is unreliable. The denial of nuclear facilities being the cause of contamination and of health harm is

043-9 (cont'd)

[87] U.S. Department of Energy, Report to Congress, *Tritium and Enriched Uranium Management Plan Through 2060*, October 2015. http://fissilematerials.org/library/doe15b.pdf

[88] Joseph J. Mangano, Radiation and Public Health Project, *Health Risk to Local Residents for the Portsmouth Gaseous Diffusion Plant*, August 15, 2022.

[89] U.S. Department of Health and Human Services, *Health Consultation – Evaluation of Environmental Radiological Sampling Data Collected from 2016 to 2022 Near the Portsmouth Site, U.S. Department of Energy Portsmouth Site (Formally known as Portsmouth Gaseous Diffusion Plant)*, March 29, 2024.

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something that the Government agencies do excel at. Portsmouth plant also released chemicals, including hexavalent chromium until the early 1990s, discussed previously.

Table 3. Radionuclide contaminants in INL reprocessed fuel shipped to Y-12 and Portsmouth.

Radionuclide	Range, Weight	Comments
Plutonium	0.001 ppb to 300 ppb	Pu-239 maximum 35.3 ppb, Pu-238 maximum 0.12 ppb The americium-241 is present in the dissolver product but is not discussed in the source report as being in the final reprocessed fuel product.
Neptunium-237	1.2 to 4 ppm	
Technetium-99	0.018 to 1.8 ppb	Technetium is very long-lived and very mobile in the environment.
Uranium-236	8.42 to 15.81 percent, Aluminum and Zirconium fuels	Uranium-236 results in significant radiation exposures due to decay product uranium-232 and its decay progeny, particularly thallium-208 with its 2.6 MeV (mega electron volt) gamma emission. Other manmade uranium isotopes are present in the dissolver product but are not discussed in the source report as being in the final reprocessed fuel product.

Table Source: L.C. Lewis et al., Prepared for U.S. Department of Energy, Environmental Management, DOE Idaho Operations Office, *Idaho National Engineering and Environmental Laboratory Site Report on the Production and Use of Recycled Uranium*, INEEL/EXT-2000-00959, September 2000. https://www.osti.gov/servlets/purl/768760

043-9 (cont'd)

DOE's Projects Often Experience Cost Overruns Before Complete Collapse

The Department of Energy's project for conversion of 34 metric tons of surplus plutonium to mixed oxide fuel at the now cancelled Savannah River Site Mixed-Oxide Fuel Fabrication Facility was originally estimated to cost $1.4 billion to construct and be operating in 2004. By 2016, it was estimated to cost $17.2 billion and be completed by 2048. [90] [91] The Department of Energy sunk almost $8 billion into the MOX facility which was cancelled in 2018. The U.S. Government Accountability Office reports that the approaches for managing or disposal of Department of Energy's roughly 57 metric tons (MT) of surplus plutonium has gyrated considerably over the last 20 years, and remains uncertain.

043-6 (cont'd)

[90] Douglas Birch and R. Jeffrey Smith, *Center for Public Integrity*, "Nuclear Waste: A $1 Billion Energy Department Project Overshoots Its Budget by 600 Percent," June 25, 2013. https://publicintegrity.org/national-security/nuclear-waste-a-1-billion-energy-department-project-overshoots-its-budget-by-600-percent/

[91] U.S. Government Accountability Office, "Surplus Plutonium Disposition," GAO-20-166, October 2019. https://www.gao.gov/assets/710/702239.pdf

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Only after spending billions of dollars, the Department of Energy decided to cancel the MOX fuel project. No U.S. nuclear reactor had agreed to take the MOX fuel and the cost and schedule had spiraled out of control.

Rather than fabricating MOX fuel, it was determined to be less costly by about half, to dispose of much of the surplus plutonium at the Waste Isolation Pilot Plant (WIPP) in New Mexico. [92] There are still high costs and high risks associated with the blending and the transportation of the plutonium. And there is also the problem that WIPP is overcommitted and the Department of Energy has more waste than WIPP can hold. [93] Two accidents in 2014 at WIPP occurred, one resulted from explosion of a waste drum at WIPP which shutdown WIPP for about three years and costs to resume shipments may exceed $2 billion dollars. [94] [95]

A vast amount of misinformation is coming directly from the Department of Energy, like misleading claims that a sodium-cooled fast reactor can burn spent nuclear fuel, see https://www.energy.gov/ne/articles/3-advanced-reactor-systems-watch-2030 where DOE states that sodium-cooled fast reactors "can burn spent nuclear fuel from current reactors."

The DOE likes to imply that reprocessing spent nuclear fuel is the answer to the disposal problem. But DOE has cancelled reprocessing of high enriched fuels to recover uranium-235. And commercial spent nuclear fuel reprocessing to recover plutonium-239 was polluting and not economical. Plutonium-239 forms in a reactor that contains uranium-238 when the uranium-238 absorbs a neutron during reactor operation. The nation already has a problem trying to dispose of its surplus plutonium, so why would it make any sense to reprocess the nation's spent nuclear fuel to obtain plutonium? It is particularly troubling when DOE makes false and misleading claims that it can use reprocessing to solve the problem of the mountain (about 140,000 MT) of spent nuclear fuel the nation has already.

The Department of Energy has provided millions of dollars toward a small modular reactor called NuScale. On November 8, 2023, cancellation of the NuScale small modular reactor project slated for Idaho by the Utah Associated Municipal Power Systems (UAMPS) was

043-6 (cont'd)

[92] U.S. Department of Energy and NNSA, *Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement Summary*, DOE/EIS-0283-S2, April 2015.

[93] National Academies of Sciences, Engineering, and Medicine, *Review of the Department of Energy's Plans for Disposal of Surplus Plutonium in the Waste Isolation Pilot Plant*, Washington, DC: The National Academies Press, 2020. https://doi.org/10.17226/25593 Surplus plutonium, 48.2 MT, but not ZPPR fuel has been slated for disposal in WIPP. Only 4.8 MT of plutonium-239 to be emplaced in WIPP, the addition of 48.2 MT of surplus plutonium in WIPP greatly increases the plutonium inventory disposed of at WIPP.

[94] U.S. Department of Energy Office of Environmental Management, Accident Investigation Report, "Phase 2 Radiological Releases Event at the Waste Isolation Pilot Plant February 14,2014," April 2015. http://wipp.energy.gov/Special/AIB_WIPP%20Rad_Event%20Report_Phase%20II.pdf See Sections 7.1 and 7.2. The release was found to have been from a single drum with stated inventory in plutonium-239 equivalent curies of 2.84 PE-Ci. But based on contamination on filters at Station A of 0.1 curies PE-ci far from the exploded drum in Panel 7, using conventional safety analysis assumptions the expected amount of material released to Panel 7 would not have exceeded 2.84E-4 PE-Ci — far less than what was measured downstream at Station A. The inventory in the drum appears to have been much higher than stated for WIPP drum and the release fractions may also be incorrect. This example shows how DOE safety analyses are unreliable and biased to lower the radiological consequences.

[95] Dr. Jim Green, *The Ecologist*, "WIPP nuclear waste accident will cost US taxpayers $2 billion," September 20, 2016. https://theecologist.org/2016/sep/20/wipp-nuclear-waste-accident-will-cost-us-taxpayers-2-billion

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announced. UAMPS was unable to find enough electricity subscribers for the project because of its already noncompetitive estimated costs. The project is also called the "Carbon Free Power Project." Future spiraling cost increases would have been likely had construction begun, and ratepayers would have been on the hook for future cost increases had the project continued.

043-6 (cont'd)

NuScale had begun the process of licensing the small modular reactor design in 2008 and had been granted a standard design approval (SDA) for the 50 MW-electric (MWe), per module, design in September 2020. [96] This project wasted a tremendous amount of time and money and would have wasted far more of each had it continued, I believe, because some aspects of its unique design such as the helical steam generators remained undesigned and unproven.

Full Extent of Health Harm from Radiation to Workers and the Public Must Be Evaluated

The Draft HALEU EIS points to various EISs rather than conducting any evaluations. DOE and NRC EISs have a history of lacking adequate technical basis. All EISs that have evaluated radiation health effects have failed to acknowledge the full range of adverse health effects as they use a protection model calibrated for the outcome of cancer.

Although a tardy and incomplete report, the National Academy of Sciences stated in 2022 that "There is also increasing evidence that low-dose radiation exposure may be associated with non-cancer health outcomes such as cardiovascular disease, neurological disorders, immune dysfunction, and cataracts." [97] While the 2022 NAS report does contain some useful information, it reveals that NAS is far more interested in the health of the nuclear industry than the health of humans. The 2022 NAS report, by ignoring the airborne radiation long known to be released from pressurized water and boiling water reactors, has ignored the tremendous problem in internal radiation. The 2022 NAS report ignores the known occurrence of nuclear reactor radiological airborne emissions that historically have contaminated air, food and water. Cows graze on contaminated pastures and then the milk that mothers and children drink is contaminated. Monitoring of milk was conducted and yet limits on radioactive contamination was not based on sound science, certainly not for the developing child in utero.

043-5 (cont'd)

Some radiological releases from nuclear reactor operations are ongoing and other releases are sporadic. Monitoring programs, even when properly designed, tend to be conducted in a manner to conceal the full extent of radiological contamination. This is certainly the case around all Department of Energy national laboratories. Contamination monitoring around commercial nuclear power plants is even less reliable. Open up the boiling water reactor for an outage or crack a number of steam generator tubes at a pressurized water reactor releases radionuclides to the atmosphere. The subsequent ingestion of radiologically contaminated milk by the pregnant

[96] Arjun Makhijani and M.V. Ramana, Prepared for Environmental Working Group, *Questions for NuScale VOYGR Reactor Certification: When Will It Be Done? And then, Will It Be Safe?*," April 9, 2023.
[97] National Academies of Sciences, Engineering, and Medicine, *Leveraging Advances in Modern Science to Revitalize Low-Dose Radiation Research in the United States*, Washington, DC: The National Academies Press, 2022. http://nap.nationalacademies.org/26434 or https://doi.org/10.17226/26434.

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mother can result in fetal death, birth defects or reduced intelligence of the child, from nuclear reactor operation similar to the experience with nuclear weapons fallout from the Department of Energy's weapons testing.

The Energy Employee Occupational Illness Compensation Program Act (EEOICPA) has not been mentioned in the Draft HALEU EIS but needs to be discussed. This program is limited and does not address workers in NRC-licensed facilities. **This program, enacted in 2000, has paid out about $43 billion in compensation to people harmed by DOE's programs involving the uranium fuel cycle and much of it caused by radiation exposure.** [98]

The EEOICPA provides compensation to eligible Department of Energy nuclear workers and their eligible survivors for certain diseases, including radiogenic cancers. Uranium miners, millers and ore transporters who worked from 1942 to 1971 are also eligible for benefits under the EEOICPA via the Radiation Exposure Compensation Act. The Department of Energy programs for developing nuclear weapons and for nuclear reactor research included these activities that poisoned people: mining, milling, conversion, enrichment, fuel fabrication, nuclear reactor operation, spent fuel reprocessing and nuclear waste transportation and radioactive waste disposal. One might find that some of the problems due to inadequate monitoring of radiation exposure may have been fixed. But generally, the problems are of these radiologically polluting operations continue to harm workers and also the public.

Major Department of Energy laboratories needing EEOICPA compensation include the Idaho National Laboratory, Hanford site in Washington, Savannah River Site in South Carolina, Oak Ridge National Laboratory in Tennessee, and the Los Alamos National Laboratories in New Mexico. In addition to these five sites, there are about 130 other sites involved with Department of Energy, usually involving uranium fuel cycle work, where the workers also are eligible for EEOICAP compensation (see https://www.cdc.gov/niosh/ocas/worksite.html) The dismal record of the DOE for causing harm to workers and leaving land permanently contaminated needs to be included in the HALEU EIS.

In addition, the Draft HALEU EIS uses a harmfully high yet allowable for routine continuous radiation doses to every member of the public, no matter their age or vulnerability, as 100 millirem per year per DOE Order 458.1, Chg 4 *Radiation Protection of the Public and the Environment*. This level of dose is being treated by the Department of Energy as though it is a benign dose: it would devastate children, especially the child developing in utero. Even the EPA and NRC aspire to keep such doses below 25 or 15 millirem/yr. The Department of Energy continues an unscientifically based radiation protection dose to the public of 100 millirem/yr and apply this dose to each of several exposure pathways, not considering all the pathways together. In other words, give the embryo 100 mrem/yr from milk, and another 100 mrem/yr from water, and another 100 mrem/yr from the spent nuclear fuel shipments going by, etc. In each case, the

043-5 (cont'd)

[98] National Academies of Sciences, Engineering, and Medicine, *Leveraging Advances in Modern Science to Revitalize Low-Dose Radiation Research in the United States*, Washington, DC: The National Academies Press, 2022. http://nap.nationalacademies.org/26434 or https://doi.org/10.17226/26434.

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DOE's analysis would say each release was acceptable because it was below the DOE Order 458.1's allowable 100 mrem/yr routine dose to the public.

In terms of accidents, the Department of Energy has its own regulations that require it to keep accident doses below 25 rem to the public. Obviously, this is a life-shortening cancer-causing dose to adults and lethal to vulnerable populations. But even this deadly dose was deemed just too inconvenient and too expensive by the Department of Energy. At the Department of Energy's Los Alamos National Laboratory, the DOE [and National Nuclear Security Administration, (NNSA)] decided to ignore the DOE's own regulations and not attempt to design systems and barriers to prevent accidents involving radiation doses to the public exceeding 25 rem and contamination that would cause permanent evacuation.

An August 2022 letter from the DNFSB to DOE states that the National Nuclear Security Administration (NNSA) has, for LANL in New Mexico, accepted **the extraordinarily high mitigated offsite dose consequences range from 490 to 3175 rem, via the "exigent circumstances processes."** Typically, radiation doses above about 400 rem are considered lethal. Vast areas would become permanently uninhabitable with plutonium and citizens will die because of the extraordinary and irresponsible lack of adequate safety mitigations.

The Department of Energy can cite its own regulations and yet at any time they chose, DOE can decide not to comply with its own regulations. Reasonable-sounding regulations are paraded in documentation such as in the many Environmental Impact Statements for NEPA including those cited by the Draft HALEU EIS. It is implied that these agencies actually comply with these regulations rather than exempt themselves from complying.

Rather than comply with 10 CFR 830 for Department of Energy nuclear facilities and meet the intent of these regulations to protect the offsite public, DOE and/or NNSA can and have invoked the "exigent circumstances processes." At LANL's PF-4, rather than ensure the offsite public dose remains well below 25 rem, the DOE is accepting the offsite public dose **consequences range from 490 to 3175 rem.** Despite the mitigated radiation doses to the offsite public being far above 25 rem, they are refusing to upgrade the confinement ventilation system or glove boxes. They are also refusing to implement meaningful and enforced combustible loading limits and by reducing the amount of material at risk, the grams of material in vulnerability storage or processes, to reduce the risk. [99] [100]

With needed safety upgrades, cost is used as the excuse to put workers and the public at risk. With nuclear industry contracts, false promises, and the HALEU schemes, the enormous cost doesn't seem to matter. [101]

[99] Public Comment Submittal from Tami Thatcher to the Defense Nuclear Facilities Safety Board (DNFSB) Regarding the Public Hearing on Los Alamos National Laboratory held in Santa Fe, New Mexico on November 16, 2022, at http://www.environmental-defense-institute.org/publications/CommentDNFSB2022.pdf

[100] Defense Nuclear Facilities Safety Board letter to the Department of Energy, Secretary Jennifer Granholm, dated August 11, 2022, which transmits the DNFSB Staff Report "Receipt and Repackaging of Large Amounts of Heat Source Plutonium at the Los Alamos National Laboratory Plutonium Facility," May 27, 2022, at DNFSB.gov

[101] Defense Nuclear Facilities Safety Review Board website at dnfsb.gov, November 16, 2022 meeting on the Los Alamos National Laboratory, see meeting agenda, videos, exhibits for cleanup and increased pit production and

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043-13

043-13 Costs and actions related to operations at the Los Alamos National Laboratory plutonium facility (PF)-4 are not within the scope of the HALEU EIS. DOE takes its responsibility for the safety and health of the workers and the public seriously. DOE prepared the HALEU EIS and included information necessary to determine the potential for environmental impacts. DOE does not ignore scientific evidence for the health effects from radiation. As needed, DOE updates its radiological protection requirements to implement requirements consistent with the latest approved information from the International Committee on Radiation Protection (ICRP) and the U.S. Environmental Protection Agency (EPA). For the public and environment, these requirements flow to several DOE orders and standards. As an example, DOE Order 458.1 establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE pursuant to the Atomic Energy Act of 1954, as amended. While DOE is committed to meeting its safety obligations to the public it should be noted that all of the facilities that could be used in the commercial HALEU fuel cycle would be regulated by agencies other than the DOE, primarily by the NRC and state regulatory authorities in Agreement States.

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The Department of Energy's History of Withholding Unfavorable Epidemiology Makes Any EIS Finding Regarding Human Health by DOE Not Credible

The Department of Energy had asserted that its activities had not threatened human health, even from its Nevada Weapons Testing. Ultimately in 1990, Congress finally enacted the Radiation Compensation Exposure Act to compensate a portion of the people harmed by DOE. Efforts to expand coverage to all affected populations have been attempted for years, including in 2024. The government as long denied the extent of the harm and the Radiation Exposure and Compensation Act has not been expanded to downwinders in New Mexico [102] or downwinders in Montana and other states including Idaho. [103]

The Department of Energy had withheld epidemiological results such as of increased leukemia in children in Utah from the nuclear weapons testing conducted at the Nevada Test Site that began in the 1950s. [104] Former Secretary of Energy Watkins appointed a panel to investigate the DOE epidemiology program. The Secretarial Panel for the Evaluation of Epidemiologic Research Activities (SPEERA) held public hearings from September 1989 to March 1990. Among the recommendations contained in its final report, the SPEERA advocated the removal of some epidemiologic functions from DOE control through a Memorandum of Understanding (MOU) between the Secretary of Energy and the Secretary of Health and Human Services, because of DOE's dishonest behavior.

The Department of Energy had also sought to manipulate epidemiology to lower the cancer rates in radiation workers. [105] The DOE's history of concealing unfavorable epidemiology results ended DOE's direct control of epidemiologic studies. [106] [107]

In addition, the DOE's Low Dose Radiation Research Program that conducted research from 1998 until defunded in 2011, had emphasized only the positive effects of radiation, emphasizing

043-9 (cont'd)

other information on the dnfsb.gov webpage https://www.dnfsb.gov/public-hearings-meetings/november-16-2022-public-hearing.

[102] Daneille Prokop and Marisa Demarco, *Idaho Capital Sun*, "'They scrapped us': The Trinity downwinders and New Mexico mine workers who remain unrecognized," January 16, 2024. https://idahocapitalsun.com/2024/01/16/they-scrapped-us-the-trinity-downwinders-and-new-mexico-mine-workers-who-remain-unrecognized/?emci=1009a06f-f5b3-ee11-bea1-0022482237da&emdi=a0a1c99b-77b4-ee11-bea1-0022482237da&ceid=112318

[103] Blair Miller, *Idaho Capital Sun*, "'What do we have to do?': Awareness of historic nuclear radiation grows in Montana neighborhood," January 12, 2024. https://idahocapitalsun.com/2024/01/12/what-do-we-have-to-do-awareness-of-historic-nuclear-radiation-grows-in-montana-neighborhoods/

[104] Philip L. Fradkin, *Fallout – An American Tragedy*, Johnson Books, 2004, 1989. ISBN 1-55566-331-1

[105] Gayle Greene, *The Woman Who Knew Too Much – Alice Stewart and the Secrets of Radiation,* University of Michigan, 1999. ISBN 0-472-08783-5. The Department of Energy support for and subsequent squelching of Hanford radiation worker epidemiology studies are described in Gayle Greene's *The Woman Who Knew Too Much – Alice Stewart and the Secrets of Radiation*.

[106] H. J. Geiger, *Dead Reckoning – A Critical Review of the Department of Energy's Epidemiologic Research*, Physicians for Social Responsibility, 1992.

[107] S. Wing, "A Critical Review of the Department of Energy Efforts to Investigate the Human Health Effects of Plutonium," Berger-Montague, 1996.

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any finding of cell repair and laboratory cell studies showing hormesis (beneficial effects of radiation), but kept quiet about the negative effects of radiation.

The DOE's Low Dose Program, when faced with the reality that its limited study of animals and cell cultures did not override existing human epidemiology, also had to face the issue that if conducted in a credible scientific manner, it was likely to find greater human health harm and would lead to tighter radiological standards. Thus, DOE stopped pushing its Low Dose Research because it had no reason to push the program unless it would lead to reduced radiological standards. The health of the nuclear industry has always been DOE's primary concern, not human health.

It should be remembered that the Department of Energy did not seek the creation of the Energy Employee Occupational Illness Compensation Program Act (EEOICPA). And despite the fact that the program has never completed studies to acknowledge inadequate radiological monitoring and has denied coverage to a large portion of workers, this program, enacted in 2000, has paid out about $43 billion in compensation to people harmed by DOE's programs involving the uranium fuel cycle and much of it caused by radiation exposure. [108]

The U.S. Nuclear Regulatory Commission Cancelled Meaningful Epidemiology Because They Knew that the Truth Would Kill Nuclear Energy

The U.S. NRC cancelled what would have been the first meaningful epidemiology study of health effects near US nuclear reactors, [109] despite the German epidemiology study of children living near nuclear plants have roughly double the incidence of cancer and leukemia and similar findings resulted from the study of clusters of childhood leukemia near nuclear sites including Sellafield, Dounreay and La Hague where an excess of 300-fold infant leukemia were found. [110] [111] [112]

Airborne radiological releases from nuclear power plants affect downwind residents but contaminated foods are distributed unevenly. Radioactive contamination that lands on pastures grazed by dairy cattle results in radioactively contaminated milk. Radioactive contamination also affects garden produce. Thus, the inhalation and ingestion of radionuclides varies according to

[108] National Academies of Sciences, Engineering, and Medicine, *Leveraging Advances in Modern Science to Revitalize Low-Dose Radiation Research in the United States*, Washington, DC: The National Academies Press, 2022. http://nap.nationalacademies.org/26434 or https://doi.org/10.17226/26434.

[109] NRC (Nuclear Regulatory Commission) 2010. NRC Asks National Academy of Sciences to Study Cancer Risk in Populations Living near Nuclear Power Facilities. NRC News No. 10-060, 7 April 2010. Washington, DC: NRC. The framework for the study was reported in "Analysis of Cancer Risks in Populations Near Nuclear Facilities; Phase I (2012). See cancer risk study at nap.edu.

[110] P Kaatsch et al., Int J Cancer, "Leukaemia in young children living in the vicinity of German nuclear power plants," 2008 Feb 15;122(4):721-6. http://www.ncbi.nlm.nih.gov/pubmed/18067131

[111] Spix C, Schmiedel S., Kaatsch P, Schulze-Rath R, Blettner M., Eur J Cancer, "Case-control study on childhood cancer in the vicinity of nuclear power plants in Germany 1980-2003." 2008 Jan;44(2):275-84.Epub 2007 Dec 21. http://www.ncbi.nlm.nih.gov/pubmed/18082395

[112] Chris Busby, "Infant Leukaemia in Europe after Chernobyl and its Significance for Radioprotection; a Meta-Analysis of Three Countries Including New Data from the UK," Chapter 8 of *ECRR Chernobyl: 20 Years On – Health Effects of the Chernobyl Accident*, Editors C.C. Busby and A. V. Yablokov, 2006.

043-9 (cont'd)

043-14

043-14 NRC is the regulatory agency responsible for licensing and regulating commercial use of nuclear energy to protect both public health, safety, and the environment. Decisions made by NRC regarding regulating this industry, are not the responsibility of DOE, nor are they within the scope of the HALEU EIS. Related to potential radiological impacts, please see Section 2.6.1, Section 3.1.8, and Section 3.6 of the HALEU EIS, and subsections X.3.11, X.3.12, and X.3.13 (depending on the activity, [e.g., Section 1.3.11 for mining and milling impacts]) of the Technical Report (Leidos, 2023). Each of these analyses estimate the human health impacts from HALEU production would be SMALL except for potentially MODERATE impacts in mining and milling accident scenarios.

location as well as diet. The harm depends on gender and the age of exposure and it is known that women are more vulnerable than men, and children are more vulnerable than adults. Radiological sampling of milk that was conducted in the U.S. allowed levels of radioactivity that we now know were harmful. Diminishing radioactivity levels in the diet were accompanied by immediate and significant morbidity and mortality reductions among infants and young children, from 1965 to 1970. Following nuclear power plant closures, decreases in the radioactivity of milk has been noted and reductions in deaths among infants who had lived downwind and within 64 km of each nuclear plant. Cancer incidence in children younger than 5 years of age were also noted to fall significantly after the shutdowns. [113]

043-14 (cont'd)

DOE and NRC Ignore the Fact That Low Doses of Ionizing Radiation Cause Increased Infant Mortality and This Must Be Evaluated

Jay M. Gould and Benjamin A. Goldman would write in their book *Deadly Deceit – Low Level Radiation High Level Cover-Up* of excess infant deaths near the Department of Energy's Savannah River Site and near the 1979 Three Mile Island nuclear accident. [114]

Elevated rates of infant mortality and birth defects were found in communities near the Department of Energy's Hanford site, but workers were not told of these epidemiology results and newspapers did not report the findings. [115]

Following the 1986 Chernobyl nuclear disaster, a comprehensive study also found a spike in perinatal mortality (still-births plus early neonatal deaths) in several countries that received airborne radioactivity from Chernobyl. The amount of airborne radioactivity to cause this was far smaller than generally assumed. [116]

043-5 (cont'd)

Robin Whyte wrote in the *British Medical Journal* in 1992 about the effect in neonatal (1 month) mortality and stillbirths in the United States and also in the United Kingdom. The rise in strontium-90 from nuclear weapons testing from 1950 to 1964 has been closely correlated, geographically, with excess fetal and infant deaths. The doses from strontium-90 due to

[113] Joseph J. Mangano, Jay M. Gould, Ernest J. Sternglass, Janette D. Sherman, Jerry Brown and William McDonnell, Radiation and Public Health Project, "Infant Death and Childhood Cancer Reductions after Nuclear Plant Closings in the United States," *Archives of Environmental Health*, Vol. 57 (No.1), January/February 2002.

[114] Jay M. Gould and Benjamin A. Goldman, *Deadly Deceit – Low Level Radiation High Level Cover-Up,* Four Walls Eight Windows New York, 1990. ISBN 0-941423-35-2. The finding of excess infant deaths near the Department of Energy Savannah River site around the 1970s and near the 1979 Three Mile Island nuclear accident are described in Jay Gould's book *Deadly Deceit*.

[115] Kate Brown, *Plutopia – Nuclear Families, Atomic cities, and the Great Soviet and American Plutonium Disasters,* Oxford University Press, 2013. ISBN 978-0-19-985576-6. Note that many publications use spelling variation Mayak instead of Maiak. *Plutopia* documents the elevated percentage of deaths among infants in the Richland population in the 1950s. Elevated fetal deaths and birth defects in Richland were documented by the state health reports, yet Hanford's General Electric doctors and the Atomic Energy Commission that later became the Department of Energy failed to point these statistics out. The local newspapers failed to write of it. The Department of Energy has continued to fail to tell radiation workers and the public of the known risk of increased infant mortality and increased risk of birth defects that result from radiation exposure.

[116] Alfred Korblein, "Studies of Pregnancy Outcome Following the Chernobyl Accident," from *ECRR Chernobyl: 20 Years On – Health Effects of the Chernobyl Accident*, Editors C.C. Busby and A. V. Yablokov, 2006.

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atmospheric nuclear weapons testing were less than 50 millirem (or 0.5 millisievert), according the Chris Busby. Radioactive fallout from atmospheric nuclear weapons testing would not only include strontium-90, it would include iodine-131, tritium, cesium-137, and other radionuclides, including plutonium. [117]

Radiation-Induced Birth Defects Ignored or Not Reported by U.S. Agencies and Must Be Evaluated

Time magazine recently mentioned Julian Aguon's book *What We Bury At Night*, a chronicle of how irradiated Marshallese mothers had borne "jellyfish babies" with translucent skin and no bones. From 1946 to 1958, the U.S. tested 67 nuclear weapons in the Marshall Islands near Guam. Official reports omitted the truth of the birth defects.

For more information about the health effects and after math from the U.S. bomb tests over the Pacific islands and the repeated deceptions about the consequences, read Giff Johnson, *Don't Ever Whisper —Darlene Keju, Pacific Health Pioneer, Champion for Nuclear Survivors*. [118]

Birth defects were omitted from studies of the Marshallese people that the U.S. exposed in nuclear weapons tests in the Marshall Islands. [119]

While the Department of Energy ignores its releases of uranium and thorium radionuclides in its environmental monitoring programs, despite the ever-increasing amounts of these radionuclides in our environment, honest epidemiology that finds elevated birth defects in regions that have higher levels of natural uranium is also ignored. [120]

Gulf War veterans who inhaled depleted uranium have children with birth defects at much higher-than-normal rate. The same kinds of birth defects also became prevalent in the countries where citizens were exposed to depleted uranium. There are accounts to suggest that the actual number of birth defects resulting from the World War II atomic bombs dropped on Japan and by weapons testing over the Marshall Islands have been underreported. The Department of Energy early on made the decision not to track birth defects resulting from its workers or exposed populations. But people living near Hanford and near Oak Ridge know of increased birth defects in those communities.

043-5 (cont'd)

[117] R. K. Whyte, *British Medical Journal*, "First day neonatal mortality since 1935: re-examination of the Cross hypothesis," Volume 304, February 8, 1992. https://www.bmj.com/content/bmj/304/6823/343.full.pdf

[118] Giff Johnson, *Don't Ever Whisper – Pacific Health Pioneer, Darlene Keju, Champion for Nuclear Survivors*, 2013. ISBN-10: 1489509062.

[119] Giff Johnson, *Don't Ever Whisper – Pacific Health Pioneer, Darlene Keju, Champion for Nuclear Survivors*, 2013. ISBN-10: 1489509062. *Time* magazine (around 2017) has also mentioned Julian Aguon's book *What We Bury At Night*, a chronicle of how irradiated Marshallese mothers had borne "jellyfish babies" with translucent skin and no bones. From 1946 to 1958, the U.S. tested 67 nuclear weapons in the Marshall Islands near Guam. Official reports deliberately omitted the truth of the birth defects.

[120] Kendall et al (2013). A record-based case–control study of natural background radiation and the incidence of childhood leukaemia and other cancers in Great Britain during 1980–2006. Leukemia. 27(1):3-9. http://pubmed.gov/22766784

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Commenter No. 43 (cont'd): Tami Thatcher

The nuclear industry, including the Department of Energy, is wrong to use the International Commission on Radiological Protection (ICRP) treatment of heritable disease. While the ICRP continues to say that "Radiation induced heritable disease has not been demonstrated in human populations," Chis Busby writes that evidence of genetic effects *has* been found in humans and at very low radiation doses. [121] [122]

The ICRP maintains that human evidence of genetic effects due to radiation does not exist. The ICRP then uses the study of external radiation on mice to estimate the heritable risks for humans. One study was conducted using internal radionuclides on mice and the study noted that "detailed research on internal radiation exposure has hardly ever been reported in the past." [123] **This limited study of microcephaly in mice found that far lower doses of internal radiation caused the same effect as higher doses of external radiation.**

It has been known now for a few decades that radiation exposure to the developing embryo and fetus "can cause growth retardation; embryonic, neonatal, or fetal death; congenital malformations; and functional impairment such as mental retardation." [124]

In 2007, the International Commission of Radiological Protection (ICRP) lowered its estimate of the risk of genetic harm of congenital malformations by 6-fold, from 1.3E-4 per rem to 0.2E-4 per rem. Based on the belief that the study of the Japanese bomb survivors did not detect genetic effects, **the ICRP genetic effect estimate for humans is based on studies of external radiation of mice.**

The ICRP estimate of risk of congenital malformations is a fraction of its predicted cancer risk for cancer mortality (or latent cancer fatality). The ICRP latent cancer fatality risk was 5.0E-4 LCF per rem (1991 estimate), close to the cancer mortality rate used in the Department of Energy's Versatile Test Reactor EIS of 6.0E-4 LCF per rem. [125]

While the studies of genetic injury to the Japan bombing survivors declared that they found no evidence of genetic damage, other researchers have found those studies to have been highly flawed. A report published in 2016 by Schmitz-Feuerhake, Busby and Pfugbeil summarizes

043-5 (cont'd)

[121] Chris Busby, *The Ecologist*, "It's not just cancer! Radiation, genomic instability and heritable genetic damage," March 17, 2016. https://theecologist.org/2016/mar/17/its-not-just-cancer-radiation-genomic-instability-and-heritable-genetic-damage

[122] Chris Busby, Scientific Secretary, European Committee on Radiation Risk, Presentation, "Radioactive discharges from the proposed Forsmark nuclear waste disposal project in Sweden and European Law," September 8, 2017. Online pdf 646_Nacka_TR_M1333-11_Aktbil_646_Christopher_Busby_presentation_170908

[123] Yukihisa Miyachi, J-STAGE, "Microcephaly Due to Low-dose Intrauterine Radiation Exposure Caused by 33P Beta Administration to Pregnant Mice," 2019 Volume 68 Issue 3 Pages 105-113. https://www.jstage.jst.go.jp/article/radioisotopes/68/3/68_680303/_article/-char/en

[124] Eric J. Hall, *Radiobiology for the Radiologist*, 5th ed., 2000, p. 190.

[125] U.S. Department of Energy's Versatile Test Reactor Draft Environmental Impact Statement (VTR EIS) (DOE/EIS-0542) (Announced December 21, 2020). A copy of the Draft VTR EIS can be downloaded at https://www.energy.gov/nepa or https://www.energy.gov/ne/nuclear-reactor-technologies/versatile-test-reactor. (See discussion in VTR EIS Appendix C, page C-4).

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numerous human epidemiology studies of congenital malformations due to radiation exposure. [126]

The 2016 report disputes the ICRP genetic risk estimate and finds that diverse human epidemiological evidence supports a far higher genetic risk for congenital malformations. **Nearly all types of hereditary defects were found at doses as low as 100 mrem.** The pregnancies are less viable at higher doses and so the rate of birth defects appears to stay steady or falls off at doses above 1000 mrem or 1 rem. The 2016 report found the excess relative risk for congenital malformations of 0.5 per 100 mrem at 100 mrem falling to 0.1 per 100 mrem at 1000 mrem.

The 2016 report's result for excess relative risk of congenital malformations of 5.0 per rem is 250,000-fold higher than the ICRP estimate of 0.2E-4 per rem which ICRP appears to assume has a linear dose response. (See the August 2021 Environmental Defense Institute newsletter.)

Actual Harm to Radiation Workers Must Be Evaluated

Radiation worker training today still implies that a 5-rem annual dose would not be harmful even though radiation worker epidemiology has indicated elevated health risks at doses ten times less than 5 rem annually. [127] [128] Radiation workers are still not warned of reproductive health risks such as sterility or increased risk of birth defects. [129] [130] I have witnessed the shortened life spans of workers at the Idaho National Laboratory, all of whom trusted that they were not getting excessive or health-damaging levels of radiation.

043-5 (cont'd)

[126] Inge Schmitz-Feuerhake, Christopher Busby, and Sebastian Pflugbeil, *Environmental Health and Toxicology, Genetic radiation risks: a neglected topic in the low dose debate*, January 20, 2016. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4870760/ The 2016 report found the "excess relative risk for congenital malformations of 0.5 per mSv at 1 mSv falling to 0.1 per mSv at 10 mSv exposure and thereafter remaining roughly constant."

[127] Richardson, David B., et al., "Risk of cancer from occupational exposure to ionizing radiation: retrospective cohort study of workers in France, the United Kingdom, and the United States (INWORKS), BMJ, v. 351 (October 15, 2015), at http://www.bmj.com/content/351/bmj.h5359 Richardson et al 2015 . This epidemiology study that included a cohort of over 300,000 nuclear industry workers has found clear evidence of solid cancer risk increases despite the average exposure to workers being about 2 rem and the median exposure was just 410 millirem. Also see December 2015 EDI newsletter.

[128] Email communication with INL's public relations and Director Mark Peters confirmed that radiation worker training did not include training about recent epidemiology indicating higher health risk following Peter's editorial in the Post Register on January 3. 2016 that promised more transparency, "New INL director looks ahead."

[129] See the September EDI newsletter p. 2 and Kate Brown, *Plutopia – Nuclear Families, Atomic cities, and the Great Soviet and American Plutonium Disasters,* Oxford University Press, 2013. ISBN 978-0-19-985576-6. Note that many publications use spelling variation Mayak instead of Maiak.

[130] "Health Risks from Exposure to Low Levels of Ionizing Radiation BEIR VII – Phase 2, The National Academies Press, 2006, http://www.nap.edu/catalog.php?record_id=11340 The BEIR VII report reaffirmed the conclusion of the prior report that every exposure to radiation produces a corresponding increase in cancer risk. The BEIR VII report found increased sensitivity to radiation in children and women. Cancer risk incidence figures for solid tumors for women are about double those for men. And the same radiation in the first year of life for boys produces three to four times the cancer risk as exposure between the ages of 20 and 50. Female infants have almost double the risk as male infants. BEIR VII findings are not included in Department of Energy radiation worker training, nor are the findings included in public radiation protection standards.

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Most workers do not understand the wide latitude allowed in making assumptions that can bias radiation dose estimates, nor the large uncertainty in the dose estimates. [131]

Investigations conducted of historical INL operations for energy worker illness compensation during the last two years have found shattering revelations about inadequate worker protections at the INL especially regarding inhalation of alpha emitters such as plutonium and the inability to estimate what doses these workers had received. The investigations partially include the early decades of INL operation until the 1980s but have not investigated all years of operation. [132] [133] [134] [135] [136] [137] [138] [139] Yet, as these studies for the National Institute for Occupational Safety and Health have begun to allow more workers to obtain compensation, many more studies need to be completed for various INL facilities and various years of operation. Roughly two thirds of INL illness compensation claims have been denied and these workers or their eligible survivors may die before the studies are complete.

The Department of Energy support for and subsequent squelching of Hanford radiation worker epidemiology studies are described in Gayle Greene's *The Woman Who Knew Too Much – Alice Stewart and the Secrets of Radiation*. [140] Alice Stewart is famous for the unexpected finding that very small external x-ray medical radiation doses to pregnant woman in the 1950s increased the risk of childhood cancer and leukemia.

The compensation program cannot ever compensate fully for the loss of life and loss of quality of life. And many of those workers who were made ill will be denied compensation because of DOE's inadequate radiation monitoring, inadequate record-keeping, and destruction of records.

043-5 (cont'd)

[131] "See the March 2017 EDI newsletter "How DOE underestimates the harm of plutonium inhalation," at http://www.environmental-defense-institute.org/publications/News.17.March.pdf and other newsletters.
[132] See the EDI September 2017 newsletter and the Advisory Board on Radiation and Worker health meetings webpage for August 2017 at https://www.cdc.gov/niosh/ocas/pubmtgs.html See the NIOSH/DCAS: Idaho Laboratory SEC Evaluation Report SEC-00238 from that page at https://www.cdc.gov/niosh/ocas/pdfs/abrwh/pres/2017/dc-inlsec238-082317.pdf
[133] See the July 20, 2017 presentation to the NIOSH radiation board (See August 14, 2017 board meeting) describing various problems at the Idaho National Laboratory's INTEC prior to 1981 at https://www.cdc.gov/niosh/ocas/pdfs/sec/inl/inler-238-r0.pdf
[134] INL May 2, 2016 NIOSH Radiation Advisory board recommended Special Exposure Cohort: https://www.cdc.gov/niosh/ocas/pdfs/abrwh/secrecs/bdrecinl-219.pdf
[135] ANL-West May 2, 2016 NIOSH Radiation Advisory board recommended Special Exposure Cohort: https://www.cdc.gov/niosh/ocas/pdfs/abrwh/secrecs/bdrecanlw-224.pdf
[136] See p. 19 of "INL SEC Proposed Class – Update SEC00219" at https://www.cdc.gov/niosh/ocas/pdfs/abrwh/pres/2015/dc-inlsec219-111015.pdf
[137] See EDI's June 2017 newsletter article "Why so wrong for so long?" at http://www.environmental-defense-institute.org/publications/News.17.June.pdf
[138] SC&A, Inc., "Draft Review of NIOSH's Evaluation Report for Petition SEC-00219, Idaho National Laboratory: Burial Ground, 1952-1970," SCA-TR-2017-SEC007, May 2017.
[139] Department of Labor presentation August 2017 https://www.cdc.gov/niosh/ocas/pdfs/abrwh/pres/2017/dol-update-082317.pdf p. 10-12.
[140] Gayle Greene, *The Woman Who Knew Too Much – Alice Stewart and the Secrets of Radiation,* University of Michigan, 1999. ISBN 0-472-08783-5.

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Conclusion

The Department of Energy's Draft HALEU EIS intentionally obscures the truth about the harm to workers and the public and to the environment from increased HALEU production as well as subsequent hoped-for increased nuclear reactor operation and generation of spent nuclear fuel. The Draft HALEU EIS implies that only a small amount of HALEU will be produced and gears the EIS toward the smallest total amount of 290 MT while aiming for 500 MT per year and ignoring those environmental consequences and inevitable crippling costs of spent nuclear fuel management.

043-4 (cont'd)

The Draft HALEU EIS hides the known deficiencies and problems regarding the lack of a repository for spent nuclear fuel and the likelihood that there won't be the one or more repositories needed within a hundred years. The cost of attempting to design, license, build and operate a repository also is not being recognized for the unaffordable and doomed to fail experiment that the endeavor is. The specific technical challenges of disposing of or of reprocessing and disposal, have been actively ignored by the Department of Energy and must be evaluated in the EIS.

The Draft HALEU EIS makes unsubstantiated claims about the safety of the storage of spent nuclear fuel when the DOE knows full well that there is inadequate technical basis upon which to make such claims. In fact, the atmospheric chloride-induced stress corrosion cracking is expected to cause through-wall cracking of the spent nuclear fuel canisters. It is only a matter of when this will occur. The Department of Energy has itself acknowledged that it does not have a technical basis for assessing the radiological consequences of spent nuclear fuel storage canister breach such as from expected chloride-induced stress corrosion cracking. The U.S. Nuclear Regulatory Commission has licensed spent nuclear fuel dry storage in locations like San Onofre, California, that are particularly vulnerable to chloride-induced stress corrosion cracking, despite knowing of the vulnerability and knowing that no method to detect or repair canister cracking exists. With the deployment of mobile reactors that seek to use HALEU fuels, there were be far more spent nuclear fuel storage locations and greater complexity of widely varying spent nuclear fuel storage systems. Serious safety challenges pose far greater harm than acknowledged in the Draft HALEU EIS and the enormous economic cost of shifting toward the costliest way to generate electricity is lacking from the evaluation in the HALEU EIS. Cradle-to-grave costs of HALEU and that includes the cost of spent nuclear fuel management and disposition (disposal) must be evaluated and not just for token quantities of HALEU production.

043-3 (cont'd)

The prediction of when spent nuclear fuel canister integrity will fail depends on factors specific to each canister: the canister design, the atmospheric humidity and chloride level, the temperature of the canister surface, and others. The licensing of spent nuclear fuel dry storage by the U.S. Nuclear Regulatory Commission has not assured safe storage of spent nuclear fuel. Indeed, the NRC granted licenses for dry storage when expecting that the canisters would only need to survive for about twenty years before being accepted for disposal. The NRC has not yet

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Commenter No. 43 (cont'd): Tami Thatcher

043-3 (cont'd)

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Commenter No. 43 (cont'd): Tami Thatcher

043-9 (cont'd)

043-15

043-5 (cont'd)

043-15 Site-specific location of facilities (including INL) are not part of the Proposed Action. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). However, the EIS analyzed radiological impacts in Section 2.6.1, Section 3.1.8, and Section 3.6 of the HALEU EIS, and subsections X.3.11, X.3.12, and X.3.13 (depending on the activity, [e.g., Section 1.3.11. for mining and milling impacts]) of the Technical Report (Leidos, 2023). Each of these analyses estimate the human health impacts from HALEU production would be SMALL except for potentially MODERATE impacts in mining and milling accident scenarios The metric to assess human health impacts in the NEPA documents that formed the bases for the assessment in the EIS was Latent Cancer Fatalities (LCF). The formula for calculating effective dose to a reference model incorporates terms to account for all radiation types, organ and tissue radiosensitivities, population groups (including women and children), and multiple biological endpoints. Therefore, while specific organ doses are not presented in the EIS, they are considered in developing the overall risk estimates. As needed, DOE updates its radiological protection requirements to implement requirements consistent with the latest approved information from the International Committee on Radiation Protection (ICRP) and the U.S. Environmental Protection Agency (EPA). For the public and environment, these requirements flow to several DOE orders and standards (for example, DOE Order 458.1, "Radiological Protection of the Public and the Environment"). In the future, it is possible that a consensus could be reached by those organizations responsible for developing radiation protection information (including the ICRP and EPA) that regulations need to be updated based on more recent studies assessing radiological impact data. At that time, DOE and other regulatory authorities would take steps to address the implications of those changes to their radiological protection requirements and update as necessary.

Commenter No. 43 (cont'd): Tami Thatcher

Draft HALEU EIS and all of the EISs it cites, are all inadequately protective of human health. Also, the cost of these boondoggles is not affordable and diverts scarce resources away from programs that could actually help to combat climate change.

The Department of Energy continues to use a harmfully high yet allowable for routine continuous radiation doses to every member of the public, no matter their age or vulnerability, as 100 millirem per year per DOE Order 458.1, Chg 4 *Radiation Protection of the Public and the Environment*. This level of dose is being treated by the Department of Energy as though it is a benign dose: it would devastate children, especially the child developing in utero.

The HALEU production and advanced nuclear reactor boondoggle could be fatal to the U.S., with regard to human health, environment, economic, and national security considerations. That the DOE's Draft HALEU EIS does not admit any of the many serious problems with HALEU production is simply another example of an inadequate EIS by DOE.

The Draft HALEU EIS has deliberately obscured known information and history of harm from the uranium fuel cycle and has not been forthcoming about suspected problems and difficulties. The Draft HALEU EIS is a completely inadequate document. The extent to which so-called cleanup efforts do not meet cleanup standards and require attempts by fences or signs to restrict human access to areas is not being admitted. The costs of cleanup of HALEU contamination from mining, milling, conversion, enrichment, fuel fabrication is not adequately addressed in the Draft HALEU EIS.

The cost of sought-after reactor operations that create vast quantities and varieties of spent nuclear fuel that will requirement storage and permanent disposal is not adequately addressed in the Draft HALEU EIS. The hazards of the routine levels of radiological contamination and from accidents are not adequately addressed in the Draft HALEU EIS or the EISs it cites.

That Congress is supporting such an economically unviable Department of Energy promotion of advanced nuclear reactors and HALEU production is a product of how uninformed and misinformed Congress is. Congress will need to take far more steps to assure that they obtain the full picture of the problems now facing the nuclear industry regarding spent nuclear fuel storage and disposal. If the problems now faced were understood, Congress would not be keen on promoting HALEU production, ramping up nuclear energy or making more radioactive waste because it is unsustainable and unaffordable.

Tami Thatcher has a Bachelor of Science degree in Mechanical Engineering and worked as an Advisory Engineer for a Department of Energy contractor, specializing in nuclear facility probabilistic risk assessment and safety analysis. For over a decade, she has studied and written about nuclear energy accidents and risks, Department of Energy nuclear facility accidents and risks, environmental contamination around the Idaho National Laboratory, radiation protection issues for workers and the public, INL legacy cleanup issues, and spent nuclear fuel and high-level waste storage and disposal issues.

043-5 (cont'd)
043-6 (cont'd)
043-5 (cont'd)
043-3 (cont'd)
043-16
043-17

043-16 The HALEU EIS evaluates the hazards from nuclear fuel cycle facilities that would be required for HALEU fuel commercialization and the hazards from reasonably foreseeable activities related to using HALEU. Occupational risks are addressed for normal operations while radioactive and hazardous material releases are addressed for normal operations and accidents. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents. The analyses includes assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. Impacts from these hazards, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos technical report (Leidos, 2023), are summarized in Tables A-1 through A-4 and A-6 through A-10 of Volume 2, Appendix A of the HALEU EIS.

043-17 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. The scope of the Proposed Action is described in Section 1.5 of Volume 1 of the Final EIS. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 44: Laura Watchempino

From: Laura Watchempino
To: HALEU-EIS
Subject: [EXTERNAL] Comments on HALEU Draft EIS
Date: Sunday, April 21, 2024 11:54:13 PM

Reasons why the proposed action is **NOT NECESSARY**:
* No advanced nuclear reactors have been constructed in the U.S.
* No existing commercial reactors that would use HALEU have been identified.
* No enrichment facilities in the U.S. have been identified.
* No DOE- designated repository for high level commercial nuclear fuel waste has been constructed.
* No permitted uranium source for HALEU has been identified.

Therefore, DOE has failed to justify a current need for a commercial HALEU source other than for export to China and Russia, the only places with "fast reactors" that can use HALEU. ***044-1***

HALEU production for export would undermine our national security in the United States and would incentivize nuclear proliferation throughout the world. ***044-2***

Furthermore, unidentified HALEU facilities should not be grandfathered into this DEIS with an abbreviated "environmental review" as proposed. Instead, a **site-specific EIS** for any future enrichment facility, not yet identified, is required.
The public should not be expected to rubber stamp HALEU production at existing nuclear complexes with unremediated contamination. NEPA requires an evaluation of cumulative impacts in addition to direct and other indirect impacts of a proposed action. ***044-3***

The DEIS fails to address the legacy of contamination from historic uranium production in the U.S. that exposed workers and nearby communities to radioactive gases, gamma radiation, and poisoned their drinking water. Legacy contamination at these sites continues to plague these environmental justice communities with degraded air quality, water supplies, and disparate health impacts.

Communities previously impacted by the uranium industry were generally people of color and/or people with low incomes that were never informed how their disparate health conditions were due in large part to uranium production in their neighborhoods and homelands, or to radioactive and toxic releases from the large volumes of uranium waste rock produced and discarded in their communities, or the uranium mill waste stockpiled next to their homes and agricultural fields, where it remains to this day. Nor were they told that the waste will remain dangerous for tens of thousands of years. Further, no epidemiological studies were ever performed linking their health conditions across several generations to past uranium production. ***044-4*** ***044-5***

Other areas of concern:
* The Nuclear Nonproliferation Treaty, to which the U.S. has been a signatory for 55 years, imposes an obligation on the U.S. to consider both the radiological and nuclear terrorism risks associated with HALEU production. ***044-2 (cont'd)***
* DOE must honor its federal trust responsibility to protect the cultural and natural resources of tribes, especially their water sources, so essential to life in water-short regions like the southwestern U.S. ***044-6***
* DOE needs to initiate government-to-government consultation with affected tribes on HALEU. A meeting open to tribes does not qualify as government-to-government tribal consultation. ***044-7***

044-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. See Section 1.1. of the EIS for more information. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's responses. DOE's Proposed Action is intended to address the underlying dilemma of how to coordinate the development for a supply HALEU with the concurrent development of the reactors that demand its availability. Note that the Energy Act of 2020 states that the HALEU is for civilian domestic use, not export. As described in Section 1.0.2 of the HALEU EIS, the Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use, and to make such HALEU available to members of a DOE HALEU consortium by January 1, 2026 (Section 2001 of the Energy Act of 2020 (a)(1); (2)(H) [42 U.S.C. 16281(a)(1); (2)(H)]).

044-2 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 44 (cont'd): Laura Watchempino

Submitted by:
Laura Watchempino
[redacted]

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044-3 The EIS will inform DOE's decision whether or not to (1) Facilitate the establishment of commercial HALEU fuel production capability and (2) Acquire (through HALEU as enriched uranium hexafluoride and deconversion services) from commercial sources, up to 290 MT of HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance. The EIS has limited ability to present site-specific impacts for future activities because DOE's Proposed Action does not entail making site-specific decisions and because the eventual site-specific decisions involve commercial activities regulated by the NRC, States, and other federal agencies. Further, due to the large number of activities and potential facilities evaluated in this HALEU EIS and the uncertainty of the numbers and locations of facilities, a cumulative effects analysis for the majority of Proposed Action and related activities is not possible (please reference Chapter 4 of the Final EIS for additional information regarding cumulative impacts associated with the HALEU EIS). The assessments of the Proposed Action in the EIS focus on past NEPA analysis for facilities which subject matter experts evaluated to determine the potential impact of future operations in support of the Proposed Action, including health and safety. DOE acknowledges that issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. However, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include assessments of the existing affected environments, including cumulative effects and health impacts from prior operations at specific locations. For additional information see Section 2.4, "Legacy Issues," of this CRD.

044-4 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting legacy issues. Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. Unrelated to the Proposed Action but related to various concerns about legacy issues, DOE's Office of Legacy Management (https://www.energy.gov/lm/office-legacy-management) was established to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the

environment. In addressing its mission, the Office of Legacy Management functions to protect human health and the environment through effective and efficient long-term surveillance and maintenance. Preserve, protect and make accessible legacy records and information. Support an effective and efficient workforce structured to accomplish departmental missions. Implement departmental policy concerning continuity of worker pension and medical benefits. Manage legacy land and assets, emphasizing safety, reuse, and disposition. Mitigate community impacts resulting from the cleanup of legacy waste and changing departmental missions. Actively act as liaison and coordinate all policy issues with appropriate departmental organizations. The efforts associated with the Proposed Action are independent of the efforts to address legacy issues. Any action DOE takes to implement the Proposed Action would not impact the efforts DOE or other regulatory bodies are taking to address legacy issues associated with defense and commercial uranium production. Please also reference Section 2.4, "Legacy Issues," of this CRD for more information.

044-5 Epidemiological studies would address past activities and their impact on surrounding communities. As such, the studies would be site and area specific. However, the HALEU EIS will not result in the selection of specific sites for all of the activities needed to implement the Proposed Action. For additional information see Section 2.4, "Legacy Issues," of this CRD.

044-6 The Department of Energy (DOE) takes our commitment to strengthening Tribal sovereignty and self-governance seriously, and we know that fulfilling Federal trust and treaty responsibilities to Tribal Nations along with robust and meaningful consultations are the cornerstones of Federal Indian policy. DOE contacted all Federally Recognized Tribes through formal letters and hosted three Tribal Listening Sessions to determine Tribal concerns about the Proposed Action. Additional notifications were also sent via Tribal newspapers/newsletters, email notifications, and social media to solicit Tribal input throughout the comment period. At this time, DOE has received two government-to-government consultation requests from the Morongo Band of Mission Indians and from the Agua Caliente Band of Cahuilla Indians. Please see Section 6.1, "Consultations," of the Final EIS for additional information about Tribal consultation. DOE remains open to additional government-to-government consultation requests. As noted previously, DOE is not making decisions regarding specific facilities or activities and therefore is not pursuing activities that are ripe for Section 106 consultation. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental and

Commenter No. 44 (cont'd): Laura Watchempino

Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies. In the meantime, DOE continues to encourage Tribal participation and remains available for government-to-government consultations consistent with our trust responsibilities.

044-7 Without project locations, DOE could not identify Tribes in an Area of Potential Effect which impacted DOEs ability to initiate consultation. Due to the potentially national scope of this program, DOE hosted three Tribal Listening Sessions not only to receive Tribal feedback on the HALEU EIS, but also to provide more information to Tribes considering formal consultation opportunities on the HALEU EIS. While these meetings were intended to more meaningfully engage with Tribes, DOE recognizes that these meetings did not fulfill consultation requirements set forth by DOE Order 144.1. In addition to these meetings, formal Tribal letters and emails were distributed to all 574 federally recognized Tribes. These notifications communicated to Tribal leaders the availability of the Draft HALEU EIS, the mechanisms to submit comments, and opportunities to initiate government-to-government consultation, in addition to providing information about upcoming Tribal listening sessions. At this time, DOE has received two government-to-government consultation requests from the Morongo Band of Mission Indians and from the Agua Caliente Band of Cahuilla Indians. Please see Section 6.1, "Consultations," of the Final EIS for additional information about Tribal consultation.

Commenter No. 45: Jeri Fry

From: Jeri Fry
To: HALEU-EIS
Subject: [EXTERNAL] Comment on HALEU Environmental Impact Statement
Date: Sunday, April 21, 2024 4:54:11 PM
Attachments: 2024-04-22 Jeri Fry Comment on HALEU EIS.pdf

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy

Please see the attached comment.
Respectfully,
Jeri Fry
[redacted]

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Commenter No. 45 (cont'd): Jeri Fry

Jeri L Fry
[redacted]

April 22, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
Email: HALEU-EIS@nuclear.energy.gov

Re: Comment urging No Action on (and possible rewrite of) HALEU-EIS

Dear Mr. James Lovejoy,

Thank you for this opportunity to comment on the *draft EIS for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU).* Please post my letter on all appropriate sites. This comment letter is mine personally even though I am a founding Director of Colorado Citizens Against ToxicWaste, Inc est. 2002 (CCAT) and I actively serve as Vice-Chair of the Lincoln Park/Cotter Superfund Site Community Advisory Group (CAG). **For the reasons below, please choose the No Action Alternative and forgo support of HALEU**. ***045-1***

Granted, nuclear is a compelling energy choice, but it is not a clean energy **source**. I know first-hand about the deformed culture of this industry. Its urgent, secret and unregulated beginnings led us down a 60-year path that incubated commercial nuclear development companies like Centrus Energy Corp.

I am a second-generation neighbor of a 40-year-old Superfund Site in southeastern Colorado left by the uranium milling at the front end of the nuclear fuel cycle. My radioactive neighbor (EPA ID COD042167858) is a daily residual reminder and threat to my community that is not cleaned up. **I bear witness to the desperate need for sincere investment in policy and technology at the filthy nuclear front end** not to mention the need to clean this site up. In 2000, General Atomics bought and still owns the company that left this toxic landscape feature to live in geologic time on the headwaters of the Arkansas River. I see that General Atomics is one of the sixty-six DoE HALEU Consortium members - all of which are nuclear development companies. ***045-2***

DoE's draft EIS proposes to do the bidding of the restless nuclear development companies who will profit most from this imagined HALEU ***045-3***

045-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

045-2 DOE acknowledges your concerns about your community and past contamination. In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Mining and milling operations have, in particular, resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. However, previously contaminated sites are not in the scope of the Proposed Action and therefore are not evaluated in this EIS. For additional information see Section 2.4, "Legacy Issues," of this CRD. While DOE understands the historic impacts of the uranium industry past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. The uranium ore mined and processed to produce the HALEU under the Proposed Action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no mining/milling wastes with unique characteristics. All mining/milling wastes have a path to disposal. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See section 2.6.1.10.

045-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional

Commenter No. 45 (cont'd): Jeri Fry

economy. Specifically, the HALEU Consortium and the "*industry led member driven*" Nuclear Energy Institute are powerful voices obviously heard by Congress. I am grateful that NEPA affords me this comment period to be heard.

045-3 (cont'd)

Regardless of DoE's stated commitment to include all entities involved in the nuclear fuel cycle, the EIS fails to demonstrate that this was done.

Baked into the Energy Act of 2020 Congressional directive to DoE are tasks that shamelessly make DoE the handmaiden of the industry. DoE can only abide by this directive from Congress.

Such brazen governmental action has been done before. Historically the 1992 Energy Policy Act birthed Centrus Energy Corp. from the federally incubated United States Enrichment Corporation (1993). Public offering of USEC brought the US Treasury more than $3billion. It is understandably easy to listen to the leverage power of such a financial legacy. But there is an enormous cost to individual people like me and to the environment.

045-4

Listening to the people who have paid and continue to pay this price will balance industry's imagined future of nuclear development with a comprehensive understanding of the costs to human health and the environment that we already live with.

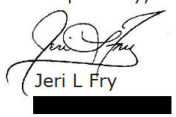
Such listening will also shed light on how well the National Environmental Policy Act is doing "*to encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man.*"

There are communities that are collateral damage from the brutal decisions of the government in a unique time of national security and secrecy. Repeating that audacious path will also repeat the collateral damage. **I urge that the DoE take the No Action choice and submit a fully revised EIS that will support and promote more circumspect nuclear development.**

045-2 (cont'd)

045-1 (cont'd)

Respectfully,



Jeri L Fry

[redacted]

045-4 Public involvement is fundamental to an EIS process and valued by DOE. Details about DOE's public outreach for this EIS have been added to the Final EIS in Section 1.3.1 of Volume 1. Each comment provided, whether from a member of the public, Tribal communities, non-profits, industry, or other federal agencies, was considered in preparing the Final EIS.

direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Sections 2.1, "Support and Opposition," and Section 2.2, "Purpose and Need," of this CRD for a discussion of these topics and DOE's response. Please also see Section 1.1 in the EIS. DOE's Proposed Action is intended to address the underlying dilemma of how to coordinate the development for a supply HALEU with the concurrent development of the reactors that demand its availability.

Commenter No. 46: Diana Cahall

From: Diana Cahall
To: HALEU-EIS
Subject: [EXTERNAL] Federal Register :: Notice of Availability of the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)
Date: Sunday, April 21, 2024 2:14:06 PM

https://urldefense.us/v3/__https://www.federalregister.gov/documents/2024/03/07/2024-04799/notice-of-availability-of-the-draft-environmental-impact-statement-for-department-of-energy__;!!Az_Xc1LHMyBq19w!Ppv8bIPhEixIYr_4cyfglTx1QLixSUSe9g7hdfMrtPECjbN_glpjLcacKVTQZCzgmZG13mFItQDx_7ewLQhCB3jY0RgVdnq0Mw$

Sent from my iPad

Mr. James Lovejoy
HALEU EIS Document Manager

Dear Mr. Lovejoy:

Please include the enclosed comments as part of the official record of proceedings in the above noted agency action.

I have spent several hours attempting to familiarize myself with basic information concerning the HALEU production issues currently under consideration by DOE. I am requesting DOE seriously consider extending the public comment period so that I and others have appropriate time to research and comprehend in order to provide informed, and well documented comment. ***046-1***

I am also requesting DOE provide responses to questions raised during said comment period with notification to all interested parties and availability of issuance of final EIS. ***046-2***

The scope of the draft EIS is excessively broad in its proposed actions which require multiple large impact projects to implement. Each of these projects requires an EIS be done by DOE as mandated by NEPA. The agency should not shift its responsibility for later review to other another agency, specifically the Nuclear Regulatory Commission. ***046-3***

The interests of other for profit corporations have already been solicited by DOE by the creation of a HALEU Consortium which held a closed door meeting on February 17, 2024. Public notice was provided to the public two days prior on February 15, 2024.
However, the notice also specified closed to the public and the press. The HALEU Consortium, as of end of last week, is composed of 67 members, all with vested interests, nearly all with vested nuclear interests. I intend to submit the entire list with these interests specifically detailed should the agency grant request for extension of comment period. However, it does seem certain the agency is all ready aware of these parties and their interests in HALEU. ***046-4***

The agency should not purport to advance climate goals in promoting HALEU as part of the solution to climate change. By the time HALEU is reasonably available as a solution it will be too late to accomplish climate goals in any meaningful way, that is if SMRs actually function without major incidents as promised. ***046-5***

I reserve the right to supplement these comments as more time becomes available.
Thank you for any consideration the agency may give my comments and for providing this opportunity.

Respectfully submitted,
Diana Cahall
[redacted]

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This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.
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046-1 Holding a 45-day comment period complies with Federal NEPA requirements and previous environmental impact statements published by DOE have proved 45-days is sufficient for stakeholders to submit comments on Federal projects. DOE-NE accommodated comments submitted past the close of the comment period to the extent practicable and additionally began accepting comments with the publication of the DOE Notice of Availability (NOA) on February 29, 2024, more than a week prior to EPA's publication of the NOA. Therefore, DOE did not feel a formal comment extension was warranted. Please reference the response provided in Section 2.7, "NEPA Process," for further discussions about comment extensions.

046-2 For questions asked during the Tribal Listening Sessions' question and answer portion, most of the questions were answered during the sessions. The virtual Tribal Listening Sessions, including the questions asked and DOE's responses were recorded and are currently posted on the project website (https://www.energy.gov/ne/haleu-environmental-impact-statement). Other questions received on the Draft EIS were procedural questions about what contractors were involved and whether public and Tribal comments would be available to the public. The preparing contractors are listed in Chapter 8, "List of Preparers," in Volume 1 of the Final EIS. Comments and DOEs responses are included in this CRD (Volume 3 of the Final EIS). Providing notification to all identified interested parties of the availability of these answers was not deemed necessary; however, all identified interested parties will be notified of the issuance of the Final EIS.

046-3 The Proposed Action is to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent U235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production. As stated in Section 2.1, the EIS addresses a list of activities facilitating the commercialization of HALEU fuel production and acquisition of up to 290 MT of HALEU. These activities and reasonably foreseeable related activities were included in the scope of the EIS to ensure that the analysis of the Proposed Action was comprehensively, and that analysis was not segmented in violation of NEPA. The Proposed Action does not include selecting site-specific locations; site-specific locations are expected to be proposed in the future and would be evaluated by the cognizant regulatory agency, in many cases the Nuclear Regulatory Commission (NRC).

046-4 While HALEU EIS activities may impact the HALEU Consortium, the HALEU Consortium is a part of the broader DOE HALEU Availability Program, which falls outside the scope of this HALEU EIS. Therefore, their public involvement activities are not related to the public outreach activities of this EIS.

Commenter No. 46 (cont'd): Diana Cahall

046-5 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Even with the timeline the commenter identified, nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs).

Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

Commenter No. 47: Jan Boudart

From: Jan Boudart
To: HALEU-EIS
Subject: [EXTERNAL] Comments spoken at DOE/HALEU meeting, April 3rd, 2024 meeting 8pm ET
Date: Tuesday, April 16, 2024 3:03:05 PM

Regarding https://www.energy.gov/ne/haleu-environmental-impact-statement

Comments for DOE HALEU meeting

I'm Jan Boudart, a member of the Nuclear Energy Information Service, but these comments are my own personal observations, not from NEIS.

On page one of the Reader's Guide to the Draft Environmental Impact Statement for DOE Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium — the Summary — it says "The production of HALEU under DOE's Proposed Action would require the following activities", the first of which is Uranium mining and milling. *047-1*

But U-mining and -milling is not one operation but 3 operations and 2 of these should be listed separately: mining and milling. (The third operation, Transportation is later in the same list.) [In Situ mining and recovery of U-Oxide (yellow-cake) with transportation to Metropolis Illinois, Superman's hometown on Earth, should have its own section in the EIS (footnote)]. *047-2*

The single listing of mining and milling, obfuscates their separate contamination sites, the mine and the mill, and the contamination of the road in between. One example of several that could be cited is the Pinion Plain Mine near the Grand Canyon in AZ and the White Mesa Mill in Utah 260 or 360 miles distant depending on the route. Energy Fuels, a company based in Montreal, Canada, claims ownership of both sites. *047-1 (cont'd)*

In this example, there are 3 possible routes that start at the mine and go north through the Hopi and Diné nations. The trucks carrying radioactive ore are required only to have a tarp cover. This means that radioactive dust and stones probably will be spread along the interstate going through Indian lands. Children and families live there and cross the highway to get to destinations in their territory. The tribes have been able to forbid transportation on their local roads, but the interstate is beyond their control. What about the possibility of an accident on interstates 160 and 191 which have long stretches through tribal lands? *047-2 (cont'd)*

And this is just one instance of two contaminating processes with a very likely contaminated transportation route in between. Nuclear Fuels has several examples of mining and milling sites. Mining and milling are two processes and should be evaluated separately. Therefore, I earnestly request that the DOE separate them and that the EIS treat them each in need of environmental analysis and their transportation routes be subject to analysis the same as any trio of processes in the supply chain. *047-1 (cont'd)* *047-2 (cont'd)*

Thank you. Jan Boudart, Chicago (address & phone number submitted on request)

(footnote) "There is a lack of clear understanding of the impact of ISR mining on the aquifer and host rocks of the post-mined site and the fate of residual U and other metals within the mined ore zone."
https://www.sciencedirect.com/science/article/pii/S0009254114004495

047-1 The initial step in the production of HALEU is the extraction and recovery of uranium ore into "yellowcake." As discussed within the EIS and the Technical Report, the EIS considers two uranium mining extraction methods: (1) in-situ recovery (ISR) mining, which is the predominant extraction method currently used in the United States for uranium recovery, and (2) conventional mining, which includes open-pit and underground mining. For ISR mining, the uranium ore is oxidized from insoluble tetravalent uranium to highly soluble hexavalent uranium (U_3O_8) and is further processed at on on-site central processing plant, which uses ion exchange to extract the uranium ions from the liquid and subsequently produces yellowcake. For conventional mining, yellowcake is not produced on-site, rather this mining method requires the ore be transported to a mill where it is crushed and processed to concentrate the uranium. Although the EIS considers mining and milling as a single step in the production of HALEU to obtain the yellowcake, the Technical Report (Leidos, 2023) does consider three separate activities of ISR mining, Conventional Mining, and Milling. Please refer to "Uranium Mining and Milling" in Volume 1 of the FEIS and 1.3, "Affected Environment and Environmental Consequences," of the Technical Report for further information on potential impacts by resource. Regarding transportation, including Pinyon Plain and White Mesa, please see the response to Comment 047-2.

047-2 The commenter raises concerns related to the transport of uranium ores with only tarp cover from Pinyon Plain (formerly Canyon Uranium) mine in Arizona to the White Mesa in Utah. Site specific locations are not being determined under the Proposed Action. It would not be practical to prepare site-specific transportation analysis, including for Pinyon Plain to White Mesa, in this EIS. However, per the DOT regulation, the ores can be transported unpackaged by haul trucks (10 C.F.R. 173.427 (c)) with cover tarps to minimize dust generation through their transports. The mine licensing regulatory authority and the DOE consider the use of tarpaulin would greatly minimize or prevent the dust generation during ore transportation activities. Because the uranium within the ore would be in cobbles and stones aggregate composition, it would minimize the potential for any significant release of uranium to the surrounding air, soil, or water during normal operation or an accident condition. Any small amount of the dust that could be generated and released to the atmosphere, it would be further diluted in air before it affects any population group.

A detailed transportation analysis was performed for this EIS. Both radiological and nonradiological transportation impacts are described in Section 3.6, "Transportation," of the EIS and Section A.6, "Transportation," of Appendix A. Radiological impacts are those associated with the effects from low levels of radiation emitted during incident-free transportation and from the accidental release of radioactive materials. Nonradiological impacts are independent of

Commenter No. 47 (cont'd): Jan Boudart

the nature of the cargo being transported and are expressed as traffic accident fatalities resulting only from the physical forces that accidents could impart to humans. Details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Since the EIS does not identify specific locations for fuel cycle facilities, the EIS transportation analysis used some conservative assumptions about the distances traveled during transportation (considering longest distances between the potential locations/facilities of source and product materials [e.g., mines to conversion, conversions to enrichment, enrichment to fuel fabrication and/or deconversion, and deconversion to storage]). Therefore, the analysis is expected to bound the impacts regardless of where the facilities would be located. The analysis considered transportation of all forms of uranium materials: from the mines to the mills, from an ISR or mill to the conversion facility, from the conversion facility to enrichment facilities, from the enrichment facility to a deconversion facility, from the deconversion facility to a storage facility, and from the storage facility to the fuel fabrication facility. For the transportation analysis, all facilities were conservatively assumed to be independently sited (i.e., no co-location of facilities). As discussed in Section 3.6 and in Section A.6 of Appendix A of the Final HALEU EIS, the transportation activities would result in a small collective population risk, which is a measure of the total risk posed to society as a whole. Specific details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Table A-8 of Appendix A in the Final HALEU EIS summarizes the transportation risks for each activity within the HALEU fuel cycle. Specific analysis of the route cited in the comment is outside the scope of this EIS. However, site-specific locations are expected to be proposed in the future and would be evaluated by the cognizant regulatory agency, in many cases the Nuclear Regulatory Commission (NRC), and specific transportation routes and related impacts are expected to be evaluated during that process. See also Section 2.6, "Transportation" of the CRD for additional information.

The EIS for the operation of this mine, which identified the potential routes within the surrounding areas of the mine and the connecting highways was completed in 1986 (*Final Environmental Impact Statement Canyon Uranium Mine*). After resolving various litigations, the final routes, which are similar to those cited by the commenter, were approved as summarized in the Canyon Uranium Mine Review documents KNF-2012 and KNF-2024. Under the approved agreement, the ore that is to be transported by haul tracks is "to be tightly covered with a tarpaulin. And ore spilled will be cleaned up immediately and the spill reported to appropriate federal, state and tribal authority" (Record of Decision, Canyon Uranium Mine). The Ore will be hauled by truck to the White Mesa Mill near Blanding, Utah. Energy Fuels (the current owner of the mine) is authorized to use two haul routes. Long term, the company plans to use a route that consists of State Route 64 and US

Commenter No. 47 (cont'd): Jan Boudart

Highways 180, 89, 160, and 191 to access the mill. However, a portion of this route passes through State and private lands that require additional permissions. Until Energy Fuels obtains these permissions, the haul route will follow State Route 64 further south to I-40 at Williams then to US 89 through Flagstaff to US Highway 160 and 191. Both routes will pass through the Navajo Nation (Highway 160 and 191). The route selection and the packaging for ore transports are consistent with the U.S. Department of Transportation (DOT) that regulates the transportation of hazardous materials in interstate commerce by land, air, and water (49 C.F.R. 173). DOT specifically regulates the carriers of radioactive materials and the conditions of transport, such as routing, handling and storage, and vehicle and driver requirements (49 C.F.R. 350-399). With respect to uranium, it is a naturally occurring element with an average concentration of about 3 parts per million, or 0.07 becquerels per gram (Bq/g), in the Earth's crust (HPS, 2018). The average concentration of uranium in the groundwater of the United States is about 0.07 Bq per liter (Bq/L). The US Environmental Protection Agency's (EPA) drinking-water standard for uranium is 30 micrograms per liter, which is about 0.75 Bq L-1 (EPA, 2001). Therefore, the general population is constantly exposed to the radiation from this naturally occurring substance. The average individual in the United States annually receives about 625 millirem of radiation dose from all background sources, of which about half is received from natural sources such as cosmic and terrestrial radiation and radon-220 and -222 in homes (which are the ingrowth of isotopes part of the uranium decay chain) (National Council on Radiation Protection and Measurements, 1993). The regulatory authority and DOE consider the use of tarpaulin would greatly minimize or prevent the dust generation during ore transportation activities. Because the uranium within the ore would be in cobbles and stones aggregate composition, it would minimize the potential for any significant release of uranium to the surrounding air, soil, or water. Any small amount of the dust that could be generated and released to the atmosphere, it would be further diluted in air before it affects any population group. If a transportation accident occurred and some or all of the uranium ore spilled on the ground, the ore would be completely recovered, loaded onto a truck, and transported to the mill. Therefore, there would be no significant impacts on human health or natural resources, beyond the background radiation. References: National Council on Radiation Protection and Measurements. (1993). Risk Estimates for Radiation Protection, NCRP Report No. 115, December 31. Bethesda, Maryland. US Environmental Protection Agency. Radionuclides Rule: A Quick reference Guide, EPA 816-F-01-003 June 2001. Available at https://www.epa.gov/dwreginfo/radionuclides-rule, . HPS 2018, Health Physics Society Uranium Fact Sheet, December 2018. Available at: https://www.nrc.gov/docs/ML1918/ML19186A443.pdf.

Commenter No. 48: Jeff Luse, C3 Solutions

From: Jeff Luse
To: HALEU-EIS
Subject: [EXTERNAL] HALEU EIS comment - C3 Solutions
Date: Monday, April 22, 2024 1:22:26 PM
Attachments: HALEU EIS.pdf

Hello,

Please see the attached public comment from C3 Solutions.

Thank you,
Jeff Luse

--

Jeff Luse
Policy Analyst & Deputy Editor
C3 Solutions *(The Conservative Coalition for Climate Solutions)*
[redacted]

www.c3solutions.org
www.c3newsmag.com

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Commenter No. 48 (cont'd): Jeff Luse, C3 Solutions

C3 SOLUTIONS

April 19, 2024

Jennifer Granholm
Secretary
U.S. Department of Energy
1000 Independence Ave SW
Washington, DC 20024

We would like to thank the Department of Energy (DOE) for providing us with the opportunity to offer public comment on DOE's proposed Environmental Impact Statement (EIS) for high assay, low-enriched uranium (HALEU). C3 Solutions is a 501(c)(3) non-profit organization whose mission is to advance durable free-market energy and climate policies.

We are supportive of the Department's proposed EIS and believe that it will successfully allow the private sector to commercialize HALEU. We also applaud the Department's finding in its No Action Alternative (p.28) that failing to establish a supply chain of HALEU would have "adverse impacts on meeting greenhouse gas (GHG) reduction goals."

048-1

We are also in support of the Department's assertion that, overall, the activities necessary to create a domestic supply chain of HALEU will have a small to moderate impact on the environment. With that in mind, we believe that the Department of Energy should grant categorical exclusions for HALEU activities whenever possible.

Under the National Environmental Policy Act (NEPA), DOE has the authority to grant categorical exclusions (CEs) to a certain class of actions that the agency deems to not have a significant effect on human health or the environment and, as a result, do not require an Environmental Assessment or Environmental Impact Statement to operate. As Table S-10.1 states, all HALEU activities will likely have a small to moderate impact on the environment, depending on the location of the activity. For those actions located on the site of existing uranium fuel cycle facilities, the Department of Energy has determined that the "potential environmental consequences are SMALL for most resource areas for most HALEU activities." Since the draft EIS is generic and not site-specific because of the infancy of America's HALEU supply chain, the Department will likely need to consider CEs on a case-by-case basis. However, given the need to scale up HALEU production and the onerous regulatory system that energy developers must navigate, we would encourage DOE to liberally use CEs.

048-2

Granting CEs are in the national interest. As the EIS points out, "the [Nuclear Energy Institute] has recognized that the main challenge to establishing a commercial HALEU-based reactor economy is the upfront capital investment required to establish the enrichment capability to produce quantities of HALEU suitable for fabrication into the fuel needed for the various types of advanced nuclear reactor designs." A significant portion of these upfront capital investment costs can be attributed to energy and environmental regulatory compliance. In an October 2023 poll, the National Association of

048-1 DOE acknowledges your support for the EIS. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

048-2 DOE acknowledges your support for the Proposed Action and your request for the use of categorical exclusions when appropriate. Thank you for participating in the EIS process. Please see the discussion in Section 2.7, "NEPA Process," of this CRD for additional information regarding faster timelines.

Commenter No. 48 (cont'd): Jeff Luse, C3 Solutions

Manufacturers found that firms "ranked environment and energy regulations as the highest cost regulations at 35%."[1] The same study found that energy and environmental compliance "likely contribute the most to the total direct cost of regulation." [2]

Granting more categorical exclusions for certain HALEU activities would not come at the expense of environmental protection. Instead, it would accelerate timelines and reduce costs for HALEU production, which would lead to more affordable and reliable carbon-free energy generation.

Categorical exclusions and more efficient permitting would also benefit the taxpayer. Through bills like the Energy Act of 2020, the Infrastructure Investment and Jobs Act, the Inflation Reduction Act, and annual appropriations, Congress has authorized and deployed billions of dollars to research, development, and demonstration for advanced nuclear and HALEU fuel cycle projects. These projects have the potential to increase clean power generation but can fail to commercialize due to onerous permitting.[3] Granting CEs when applicable for HALEU activities will accelerate the commercial availability of the fuel and ensure that taxpayer-funded projects reach their full potential.

048-2 (cont'd)

The Department of Energy has provided a good, general EIS framework for catalyzing the domestic HALEU industry. With a greater emphasis on categorical exclusions, we believe that American startups and energy companies will be able to accelerate the commercialization of this fuel technology.

048-1 (cont'd)

[1] https://nam.org/wp-content/uploads/2023/11/NAM-3731-Crains-Study-R3-V2-FIN.pdf
[2] Ibid
[3] https://clearpath.org/wp-content/uploads/sites/44/2024/03/doe-modernization-report-3-24.pdf

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Commenter No. 49: Marc Brown, Consumer Energy Alliance

From: Marc I. Brown
To: HALEU-EIS
Subject: [EXTERNAL] HALEU EIS
Date: Monday, April 22, 2024 11:37:46 AM
Attachments: CEA letter HALEU EIS.pdf

Please find the attached letter from Consumer Energy Alliance regarding requests for comment on a final Environmental Impact Statement for commercial HALEU development.

Marc Brown
Vice President, State Affairs
Consumer Energy Alliance
PO Box 118
Exeter, NH 03833-2782
[redacted]

Response side of this page intentionally left blank.

Commenter No. 49 (cont'd): Marc Brown, Consumer Energy Alliance

CONSUMER ENERGY ALLIANCE
THE VOICE OF THE ENERGY CONSUMER

April 22, 2014

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy,
Idaho Operations Office,
1955 Fremont Avenue, MS 1235,
Idaho Falls, Idaho 83415

Submitted via email

Re: High Assay Low-Enriched Uranium (HALEU) Environmental Impact Statement

Dear Mr. Lovejoy:

With nearly 400 affiliate and more than 550,000 individual members nationwide, Consumer Energy Alliance's mission is to help ensure stable prices, advances in environmental performance, national energy security, and energy affordability and reliability for households and businesses across the country. CEA's members include families, farmers, small businesses, distributors, producers, organized labor, and manufacturers, all coming together to support America's environmentally sustainable energy future. Since 2006, CEA has worked to encourage families and businesses across the nation to seek sensible, realistic, affordable, and environmentally responsible solutions to meet our daily energy needs.

On behalf of Consumer Energy Alliance (CEA) and our membership we appreciate the opportunity to comment on the draft Environmental Impact Statements under consideration by the United States Department of Energy.

HALEU production is vital to the advancement of the nuclear energy industry in the United States. Its distinctive characteristics are suitable for both Small Modular Reactor (SMR) and certain 4th generation reactor designs. ***049-1***

According to the World Nuclear Association demand for HALEU is expected to increase going forward for three reasons:[1] ***049-2***

1. Use of 5-10% HALEU in existing conventional light water reactors;
2. Use of 10-20% HALEU in advanced reactors and SMRs; and the

[1] https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/high-assay-low-enriched-uranium-(haleu).aspx#:~:text=HALEU%20is%20defined%20as%20uranium,in%20the%20form%20of%20heat.

2211 Norfolk Street | Suite 610 | Houston, TX 77098 | 713.337.8800
consumerenergyalliance.org

049-1 DOE acknowledges your support for the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

049-2 DOE acknowledges your support for the Proposed Action and development of a domestic HALEU supply chain. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for further discussion of this topic and DOE's response.

Commenter No. 49 (cont'd): Marc Brown, Consumer Energy Alliance

CONSUMER ENERGY ALLIANCE
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3. Ongoing transition, which started in 1990s, of research reactors from high-enriched uranium (HEU) to HALEU.

The expansion of data centers, Artificial Intelligence, advanced manufacturing and other technologies is expected to increase electricity demand in the United States substantially. PJM recently released its updated load forecast report[2] which concluded that total electricity demand will increase nearly 40 percent in its territory by 2039.

Increasingly, large industrial consumers will look to nuclear technologies to meet their growing need for more power. For example, Google, Microsoft and Nucor Steel's RFIs[3] specifically includes advanced nuclear as a resource to meet the aggregate clean energy demand of three of the world's highest energy users.

Advanced and Small Modular Reactors utilizing HALEU as a feedstock will be invaluable in meeting this increased demand for electricity. While traditional light-water reactors provide steady, 24/7 baseload power they do not have the ability to provide the flexible load inherent in SMRs and some advanced reactors. TerraPower's Natrium reactor in Kemmerer, Wyoming is expected to break ground later this year and can flex its electricity output from 40 to 500 megawatts to balance the intermittency of Wyoming's growing onshore wind capacity.

Currently, the United States is heavily reliant on countries like Russia for both nuclear fuel and enrichment which has and, absent a robust domestic nuclear supply chain, will continue to subject the U.S. to geopolitical risks. Developing a domestic HALEU supply chain will return the United States to its former position as a global leader in nuclear energy development and will continue the advancements made over the past decade to bolster energy independence and national security.

049-2 (cont'd)

It is important the final EIS does not produce unnecessary barriers anywhere along the HALEU value chain—from mining and enrichment to deconversion and storage.

049-3

Reactors fueled by HALEU have unique characteristics that make it an environmentally responsible energy solution. They are compact in size, utilizing fewer acres of land than other emission-free generating resources; they use far less water than traditional light-water reactors reducing or eliminating impacts to aquatic ecosystems; and because of increased reactor efficiency has less fuel waste.

049-1 (cont'd)

[2] https://www.pjm.com/-/media/library/reports-notices/load-forecast/2024-load-report.ashx
[3] https://www.advancedcleanelectricity.com/

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049-3 DOE acknowledges your support for the Proposed Action, thank you for participating in the EIS process. DOE does not intend its NEPA review to create barriers for HALEU activities but has prioritized a rigorous environmental review to best understand the potential environmental impacts. Please see the discussion in Section 2.7, "NEPA Process," of this CRD for additional information.

Commenter No. 49 (cont'd): Marc Brown, Consumer Energy Alliance

CONSUMER ENERGY ALLIANCE
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CEA is focused on realistic energy policies that advance shared environmental goals and all-of the-above solutions to meet our energy and environmental demands while ensuring that the needs of those struggling to make ends meet are not forgotten.

In order to meet the growing demand for electricity in general, as well as the clean energy goals of companies like Google, Microsoft and Nucor, the United States must advance solutions that result in a strong domestic supply chain for HALEU to feed burgeoning advanced reactor technologies.

049-1 (cont'd)

Thank you for your consideration.

Respectfully submitted,

Marc Brown
Vice President, State Affairs
Consumer Energy Alliance

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consumerenergyalliance.org

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Commenter No. 50: Robin Englehart-Bagley

From: Robin EH. Bagley
To: HALEU-EIS
Subject: [EXTERNAL] HALEU comments
Date: Monday, April 22, 2024 10:53:20 AM

Thank you for the opportunity to submit comments on the Department of Energy's proposal to acquire high-assay low-enriched uranium (HALEU) for use in new generation nuclear reactors such as TerraPower's Natrium reactor.

I am gravely concerned about the amount of taxpayer dollars that DOE is spending on the TerraPower project overall, and this is compounded by the department now working to stand up the fuel sourcing for the plant. DOE must be transparent about the amount of funding being spent on this project, both the construction and the HALEU pieces.
TerraPower should not have to depend on such heavy subsidization in order to deploy their project. They should be able to bear the costs without the taxpayers picking up half the tab. If that is not a viable option for the company, then it stands to reason that the Natrium plant is not commercially viable.
Overall, I fear that billions of taxpayer dollars are going to be wasted on DOE's push for revitalizing the nuclear power industry, and HALEU production in particular, with little to no results.
Thank you.

Robin Englehart-Bagley
[redacted]

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050-1

050-1 The Natrium power plant is outside the scope of this EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information about funding for the Proposed Action.

Commenter No. 51: Keith Blaylock

From: Keith Blaylock
To: HALEU-EIS
Subject: [EXTERNAL] Regarding proposed decision to acquire HALEU
Date: Monday, April 22, 2024 6:01:40 PM

Subsidizing fuel for nuclear energy:

To whom it may concern:
Please do NOT continue to fund HALEU. The federal government should not subsidize the nuclear energy industry as this is a complete waste of taxpayer dollars. Due to climate change the DOE should only consider funding renewable energy projects. We should NOT be supporting any environment destroying energy technologies, especially industries that cannot adequately dispose of the extreme environment destroying and life threatening by-products of the nuclear energy production process. *051-1* *051-2* *051-3*

Thank you for the opportunity to voice my opinion on this very environmentally sensitive issue.

Sincerely,

Keith Blaylock
[redacted]

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051-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

051-2 Renewable energy technologies do not meet the purpose and need and are outside the scope of this EIS. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

051-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is

Commenter No. 51 (cont'd): Keith Blaylock

discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation". This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 52: Nicholas McMurray, International and Nuclear Policy

From: Nicholas McMurray
To: HALEU-EIS
Cc: Nicholas McMurray
Subject: [EXTERNAL] ClearPath - Comments on DOE Draft HALEU EIS
Date: Monday, April 22, 2024 5:56:12 PM
Attachments: 20240422_ClearPath_Draft HALEU EIS_Comments.pdf

Hello Mr. Lovejoy,

Please see attached ClearPath Comments on the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) (DOE/EIS–0559).

Thank you for the opportunity to comment. Please do not hesitate to reach out to me if you need additional information or have any questions.

Nicholas McMurray
Managing Director, International and Nuclear Policy
mcmurray@clearpath.org

Response side of this page intentionally left blank.

Commenter No. 52 (cont'd): Nicholas McMurray, International and Nuclear Policy

CLEARPATH

ClearPath
518 C St NE, Suite 300
Washington, DC 20002

April 22, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415

Subject: ClearPath Comments on the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) (DOE/EIS–0559)

Dear Mr. Lovejoy,

ClearPath appreciates the opportunity to comment on the Department of Energy's (DOE) draft Environmental Impact Statement (EIS), analyzing the potential impacts of the Proposed Action to acquire high-assay low-enriched uranium (HALEU) for new nuclear reactors. ClearPath fully supports DOE moving forward with implementing the Energy Act of 2020's Advanced Nuclear Fuel Availability Program (as amended) in accordance with Congressional intent. ***052-1***

ClearPath's mission is to develop and advance policies that accelerate innovations to reduce and remove global energy emissions. To advance that mission, we develop cutting-edge policy solutions on clean energy and industrial innovation. An entrepreneurial, strategic nonprofit, ClearPath (501(c)(3)) collaborates with public and private sector stakeholders on innovations in nuclear energy, carbon capture, hydropower, natural gas, geothermal, energy storage, and heavy industry to enable private-sector deployment of critical technologies.

Access to HALEU is critical for new nuclear technologies, and the DOE has an important role to play in bridging the gap between the first-of-a-kind nuclear reactors under development today and commercial nuclear fuel companies bringing the necessary capacity online. Moreover, a secure and resilient domestic nuclear fuel supply chain is essential for national security and energy independence. Russia and China collectively control nearly 60 percent of the global supply of enrichment services needed to fuel the next generation of reactors.[1] The Advanced Nuclear Fuel Availability ***052-2***

[1] https://clearpath.org/our-take/re-establishing-american-uranium-leadership/

052-1 DOE acknowledges your support for the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

052-2 DOE acknowledges your concern regarding reliance on foreign sources of uranium. Congress and DOE are also concerned about reliance on foreign sources of uranium. In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of this topic and DOE's response.

CLEARPATH

Program can mitigate risks associated with over-reliance on adversaries and help ensure that the United States remains a global leader in nuclear energy technology.

ClearPath commends the DOE's preparation of the draft EIS. In particular, it leverages existing environmental review documents to the extent practical for mining and milling, conversion, enrichment, deconversion, storage and transportation. As stated in the draft EIS, "The activities performed under DOE's Proposed Action, if implemented, have a long history of being conducted safely and none are unique to the production of HALEU, having been conducted for other uranium forms and improved over many decades." Therefore, any potential environmental impacts are well characterized. The DOE should move forward with the Proposed Action "to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production."

Congress has made extremely clear its support for the development of a domestic nuclear fuel supply chain and a robust commercial nuclear industry. To date, Congress has appropriated billions of dollars to achieve these goals, which have been matched by private industry. Implementing the Proposed Action would be in accordance with Congressional intent. Furthermore, as stated in the draft EIS, "There are no reasonable alternatives that would fulfill the purpose and need for agency action other than the Proposed Action."

Finally, similar to the DOE's efforts related to the Advanced Reactor Demonstration Program (ARDP), the DOE should strive not to duplicate environmental review activities[2] with the U.S. Nuclear Regulatory Commission (NRC), which will license the commercial nuclear fuel facilities that will produce HALEU.

Thank you for your commitment to advancing nuclear energy and fostering innovation in the energy sector. Please do not hesitate to reach out to me if you need additional information or have any questions.

Sincerely,
Nicholas McMurray
Managing Director, International and Nuclear Policy
ClearPath

[2] Department of Energy and Nuclear Regulatory Commission, "Addendum No. 7 to the Memorandum of Understanding Between United States Department of Energy and Nuclear Regulatory Commission: On Nuclear Energy Innovation Establishing Roles and Responsibilities for National Environmental Policy Act (NEPA) Implementation Requirements for Reactor Demonstration Projects Supported by DOE" (ADAMS Accession No. ML23213A147)

052-2 (cont'd)

052-1 (cont'd)

052-3

052-4

052-3 As stated in the Purpose and Need (Section 1.1 of the HALEU EIS), the purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. The Proposed Action would establish a process for DOE to encourage commercial investment in a HALEU enrichment capability. DOE acknowledges your preference for the Proposed Action. DOE reiterates the Council on Environmental Quality (CEQ) statement: "Commenting is not a form of 'voting' on an alternative" (CEQ 2021). The number of comments received for or against a particular alternative does not dictate the action that a Federal agency must take.

052-4 Thank you for participating in the EIS process. Please see the discussion in Section 2.7, "NEPA Process," of this CRD for additional information.

Commenter No. 53: Cathryn Chudy, Oregon Conservancy Foundation

From: Cathryn Chudy
To: HALEU-EIS
Subject: [EXTERNAL] Comments on Draft Environmental Impact Statement (DEIS) for DOE Activities in Support of HALEU
Date: Monday, April 22, 2024 5:38:11 PM

April 22, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy, Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
Submitted via email: HALEU-EIS@nuclear.energy.gov

Dear Mr. Lovejoy,
Thank you for providing us with the opportunity to submit comments on the Department of Energy's (DOE) Draft Environmental Impact Statement (DEIS) for DOE Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU).
Our Oregon Conservancy Foundation urges you to choose the **No Action Alternative to forgo the acquisition of HALEU**.
In support of the No Action Alternative to forgo the acquisition of Haleu, we appreciate and endorse the extensive comments submitted by Tami Thatcher:
Public Comment Submittal on the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU), DOE/EIS-0559
Comment submittal by Tami Thatcher, April 22, 2024. (Revision 1)
Thank you for taking these comments into consideration.
Sincerely,
Cathryn Chudy Board of Directors
Lloyd Marbet, Executive Director
Oregon Conservancy Foundation
19140 SE Bakers Ferry Road, Boring, OR 97009
PO Box 982, Clackamas, Oregon 9

053-1

053-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 54: Shannon Anderson, Powder River Basin Resource Council

From: Shannon Anderson
To: HALEU-EIS
Subject: [EXTERNAL] Comments on Draft Environmental Impact Statement (DEIS) for DOE Activities in Support of HALEU
Date: Monday, April 22, 2024 5:11:01 PM
Attachments: Comments to DOE on HALEU EIS.pdf
NRDC et al HALEU Scoping Notice Comm 20 July 2023 full.pdf

Dear Mr. Lovejoy,

Please see the attached comments related to the HALEU DEIS. The comments are submitted on behalf of all of the organizations signed on to each of the letters.

Thank you,

Shannon Anderson
Organizing Director
Powder River Basin Resource Council
934 N. Main St., Sheridan, WY 82801
sanderson@powderriverbasin.org

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Commenter No. 54 (cont'd): Shannon Anderson, Powder River Basin Resource Council

Powder River Basin Resource Council * Uranium Watch
Black Hills Clean Water Alliance * Colorado Citizens Against ToxicWaste, Inc.
Montana Environmental Information Center * New Mexico Environmental Law Center
Snake River Alliance * Healthy Environment Alliance of Utah * Columbia Riverkeeper
Nuclear Information and Resource Service * Ecological Options Network
Nuclear Energy Information Service * Nuclear Watch South * Leaf of Hudson Valley
Samuel Lawrence Foundation * Ohio Nuclear Free Network * Citizens' Resistance At Fermi Two * World BEYOND War * Oregon Conservancy Foundation * San Francisco Bay Physicians for Social Responsibility * Oregon Physicians for Social Responsibility * Occupy Bergen County* Unitarian Universalists for a Just Economic Community
San Luis Obispo Mothers for Peace * Nukewatch * Heart of America Northwest
Oregon Unitarian Universalist Voices for Justice * Oregon PeaceWorks * Coalition for a Nuclear Free Great Lakes * Don't Waste Michigan * Western Nebraska Resources Council
L.A. Alliance for Survival * Alliance for Democracy * Citizens for Alternatives to Radioactive Dumping * Western New York Drilling Defense * Beyond Nuclear
Tri-Valley Communities Against a Radioactive Environment * Parents Against SSFL
San Clemente Green * Western States Legal Foundation * Green State Solutions
Don't Waste Arizona * Solartopia * North American Water Office *
Energía Mía * Radiation and Public Health Project * Nuclear Free Northwest

April 22, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy, Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
Submitted via email: HALEU-EIS@nuclear.energy.gov

Dear Mr. Lovejoy,

Thank you for the opportunity to submit comments on the Department of Energy's (DOE) Draft Environmental Impact Statement (DEIS) for DOE Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU). These comments are submitted by our organizations on behalf of our thousands of members who live in states and tribal nations with air, land, and water resources directly impacted by the nuclear fuel cycle.

On behalf of our members, we urge you to choose the No Action Alternative to forgo the acquisition of HALEU. *054-1*

Taxpayers and Our Communities Should Not Bear the Cost & Risk of HALEU Production

Our organizations are opposed to further subsidies from DOE for nuclear energy, including acquiring or supporting nuclear fuel production or enrichment. Our communities already bear the burdens of past subsidies, including environmental resource damage from royalty-free uranium mining under the 1872 Mining Law, lack of adequate financial assurance *054-2* *054-3*

054-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

054-2 DOE acknowledges your opposition to the Proposed Action and your concern regarding the cost of the HALEU program. DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information regarding the costs of this program. Regarding the funding awards for advanced reactors, those activities are not within the scope of the Proposed Action, although the potential use of HALEU in advanced reactors is acknowledged in the EIS as a reasonably foreseeable activity and is analyzed to the extent practicable. Please see the discussions in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

054-3 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have, in particular, resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices.

Commenter No. 54 (cont'd): Shannon Anderson, Powder River Basin Resource Council

for mining and milling operations that leave sites orphaned, and health and safety impacts. DOE must consider the full life cycle impacts of its proposal, including the negative impacts of additional uranium mining and milling, transportation of fuels, and waste disposal.

054-3 (cont'd)

If DOE moves forward with this ill-advised proposal, please disclose the total amount of taxpayer money that will be spent as direct subsidies to companies or spent by DOE itself for administrative and operational costs of the program. Please also discuss and disclose how this spending will contribute to the national debt. DOE must disclose the true cost of subsidizing the nuclear fuel cycle.

Relatedly, DOE must consider other funding awards, such as those provided to TerraPower for its Natrium nuclear power plant or the funding awards for the Centrus facility, as connected actions within the scope of this EIS. This funding is all related - without subsidies from DOE to any part of the HALEU cycle, none of it would exist. No reactor design that would use HALEU has demonstrated commercial or technical viability.

054-2 (cont'd)

DOE Must Consider Community & Environmental Justice Impacts of Its Funding

Nuclear energy in the U.S., including the full life cycle from mining to decommissioning and disposal, has created tremendous environmental justice and public health and safety consequences. The toxic legacy of uranium and the nuclear fuel cycle has disproportionately harmed Indigenous communities across the nation, from the Midnite Mine on the Spokane Indian Reservation to the contaminated piles of radioactive tailings left over from the Cold War uranium boom on the Navajo Nation to abandoned uranium mines on the Wind River and Pine Ridge Reservations, to the radioactive contamination of the Hanford nuclear site on the Columbia River. DOE must not move forward with funding new and expanded facilities to perpetuate these issues without first addressing the legacy impacts of past funding and actions that have harmed communities throughout the United States.

054-4

Nuclear Power is Not a Solution to Climate Change

DOE bases its proposal in part on the false premise that new nuclear power, including nuclear power generated with HALEU, is necessary to abate the harm of climate change. However, new nuclear power plants take years - or decades - to design and build, and they simply won't come online fast enough to address climate change or other environmental issues related to energy production. As part of its environmental impacts analysis, the DOE should consider the full opportunity cost of spending taxpayer dollars on HALEU as opposed to other projects DOE could be supporting, such as renewable energy research & development - projects that would be able to be deployed in a short time frame to be a cost-effective solution to climate change.

054-5

Nuclear Power is Not Viable Without Permanent Waste Disposal

DOE must acknowledge that there is no permanent disposal facility for nuclear waste in the U.S. and until such a facility exists new nuclear power plants are unwise. Our organizations strongly believe that our nation shouldn't be creating new nuclear waste by subsidizing nuclear power when we have no place to safely and permanently store the waste that already exists.

054-6

For additional information see Section 2.4, "Legacy Issues," of this CRD. Provisions for financial compensation from past activities is not within the scope of this EIS.

The EIS also analyzes all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6 of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

054-4 Environmental justice is discussed in multiple sections of Chapter 3, "Impacts" (e.g., Sections 3.1.11 and 3.3.8), and new sections were added to Volume 2 (Sections A.1.3.11 and A.3.3.7). These sections provide information on communities with environmental justice concerns based on select locations of current facilities, reviewing past NEPA documents, and updating U.S. Census data for block groups, cities, counties, and states. With no specific sites identified, environmental justice analysis varied according to the type of activity (e.g., mining and milling, enrichment, etc.) and the available information from existing NEPA documents. Environmental justice impacts were considered to the extent possible given that there are no specific site locations for the HALEU fuel cycle activities (and the ROD will not specify specific sites). For further information about the EJ analysis and updates in this FEIS, please see DOE's response to Comments 056-13 and 056-28.

DOE has acknowledged that past uranium fuel cycle activities have resulted in long lasting, legacy issues. Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. Unrelated to the Proposed Action, but related to various concerns about legacy issues, DOE's Office of Legacy Management (https://www.energy.gov/lm/office-legacy-management) was established to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the environment. In addressing this mission the Office of Legacy Management functions

Commenter No. 54 (cont'd): Shannon Anderson, Powder River Basin Resource Council

In short, our organizations oppose this proposed DOE action because companies building new nuclear power plants should bear the risks and costs just like any other industry. The federal government shouldn't subsidize this industry with more taxpayer dollars. Please issue a much-revised DEIS for public review and comment and select the No Action Alternative moving forward. *054-2 (cont'd)*

Thank you for your time and consideration.

Sincerely,

Powder River Basin Resource Council
Sheridan, WY

Uranium Watch
Moab, UT

Black Hills Clean Water Alliance
Rapid City, SD

Colorado Citizens Against ToxicWaste, Inc.
Canon City, CO

Montana Environmental Information Center
Helena, MT

New Mexico Environmental Law Center
Albuquerque, NM

Snake River Alliance
Boise, ID

Healthy Environment Alliance of Utah (HEAL Utah)
Salt Lake City, UT

Columbia Riverkeeper
Hood River, OR

Nuclear Information and Resource Service
TakomaPark, MD

Nuclear Energy Information Service
Chicago, IL

LEAF of Hudson Valley
Nanuet, NY

to protect human health and the environment through effective and efficient long-term surveillance and maintenance. Preserve, protect and make accessible legacy records and information. Support an effective and efficient workforce structured to accomplish departmental missions. Implement departmental policy concerning continuity of worker pension and medical benefits. Manage legacy land and assets, emphasizing safety, reuse, and disposition. Mitigate community impacts resulting from the cleanup of legacy waste and changing departmental missions. Actively act as liaison and coordinate all policy issues with appropriate departmental organizations. The efforts associated with the Proposed Action are independent of the efforts to address legacy issues. Any action DOE takes to implement the Proposed Action would not impact the efforts DOE or other regulatory bodies are taking to address legacy issues associated with defense and commercial uranium production. Please also reference Section 2.4, "Legacy Issues," of this CRD for more information.

DOE notes that in the absence of specific site locations, DOE contacted all federally recognized Tribes through formal letters and hosted three Tribal Listening Sessions to determine Tribal concerns about the Proposed Action. Additional notifications were also sent via Tribal newspapers/newsletters, email notifications, and social media to solicit Tribal input throughout the comment period. Please also see Section 1.3.1 of the EIS for additional information on DOE's public outreach, including to Tribes.

054-5 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into

Commenter No. 54 (cont'd): Shannon Anderson, Powder River Basin Resource Council

Samuel Lawrence Foundation
Del Mar, CA

Ecological Options Network
Bolinas, CA

Nuclear Watch South
Atlanta, GA

Ohio Nuclear Free Network
Toledo, OH

Citizens' Resistance At Fermi Two
Redford, MI

World BEYOND War
New York, NY

Oregon Conservancy Foundation
Boring, OR

San Francisco Bay Physicians for Social Responsibility
San Francisco, CA

Oregon Physicians for Social Responsibility
Portland, OR

Occupy Bergen County
Teaneck, NJ

Unitarian Universalists for a Just Economic Community
Chicago, IL

San Luis Obispo Mothers for Peace
San Luis Obispo, CA

Nukewatch
Luck, WI

Oregon PeaceWorks
Salem, OR

Heart of America Northwest
Seattle, WA

production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Even with the timeline the commenter identified, nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

054-6 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges that there is currently no permanent waste repository. However, the HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. SMALL impacts are not discussed further. For a full analysis of potential

Commenter No. 54 (cont'd): Shannon Anderson, Powder River Basin Resource Council

Oregon Unitarian Universalist Voices for Justice
Portland, OR

Coalition for a Nuclear Free Great Lakes
Monroe, MI

Don't Waste Michigan
Holland, MI

Western Nebraska Resources Council
Chadron, NE

L.A. Alliance for Survival
Santa Monica, CA

Alliance for Democracy
Portland, OR

Citizens for Alternatives to Radioactive Dumping
Dixon, NM

Western New York Drilling Defense
Buffalo, NY

Beyond Nuclear
Takoma Park, MD

Tri-Valley Communities Against a Radioactive Environment (CAREs)
Livermore, CA

San Clemente Green
San Clemente, CA

Western States Legal Foundation
Oakland, CA

Parents Against Santa Susana Field Lab
Simi Valley, CA

Green State Solutions
Iowa City, IA

Don't Waste Arizona
Phoenix, AZ

impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF and is not discussed further. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Solartopia
Los Angeles, CA

North American Water Office
Lake Elmo, MN

Energía Mía
San Antonio, TX

Radiation and Public Health Project
Ocean City, NJ

Nuclear Free Northwest
Seattle, WA

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Commenter No. 55: Mary Neumayr, Urenco USA Inc.

From: Neumayr, Mary
To: HALEU-EIS
Subject: [EXTERNAL] Urenco USA Inc. Comments on DOE"s Draft EIS for Department of Energy Activities in Support of Commercial Production of HALEU
Date: Monday, April 22, 2024 4:26:11 PM
Attachments: image001.png
Urenco USA Inc. Comments on DOE HALEU Draft EIS (April 22 2024).pdf

Dear Mr. Lovejoy:

Attached please find Urenco USA Inc.'s Comments regarding DOE's *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium ("HALEU")* (the "HALEU EIS")(DOE/EIS-0559) released by the U.S. Department of Energy ("DOE") on Feb. 29, 2024.

If any questions, please do not hesitate to contact me.

Thanks and best regards,

Mary

Mary Neumayr
Director, Government Affairs

Urenco USA Inc. I 1700 N. Moore Street I Suite 1705 I Arlington I Virginia I 22209-1793 I USA
Tel: +1 (703) 682-5211 I [redacted] | Email: mary.neumayr@urenco.com I
Web: www.urenco.com

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Commenter No. 55 (cont'd): Mary Neumayr, Urenco USA Inc.

("UF6"), and supports the Department in several key activities, including the storage and management of UF6 for DOE at the UUSA site.

Urenco USA Inc. believes that DOE's Draft Environmental Impact Statement ("Draft EIS") provides a comprehensive evaluation of the potential impacts of the DOE's proposed agency action. Urenco USA Inc. supports the comments submitted separately by the Nuclear Energy Institute, and offers the following limited additional comments.

Proposed Agency Action:

Urenco USA Inc. supports DOE's statement of its Proposed Action "to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU production." Vol. 1, p. 1-16. This proposed agency action is consistent with Congress' directive in Sec. 2001 of the Energy Act of 2020 that DOE establish and carry out through its Office of Nuclear Energy a HALEU Availability Program "to support the availability of [HALEU] for civilian domestic research, development, demonstration, and commercial use." 42 USC 16281. In the Energy Act of 2020, Congress specifically directed DOE to consider options for ensuring adequate HALEU supplies, including through the acquisition of HALEU that is produced in the United States by a commercial entity. 42 USC 16281(a)(2)(D)(v).

055-1

DOE's proposed agency action to acquire HALEU from commercial entities would facilitate development of a reliable and adequate supply of HALEU for civilian and commercial use. To date there has not been sufficient private incentive by the advanced reactor community to invest in commercial HALEU production. Commercial investment in HALEU facilities will not be made on a speculative basis; that is, investment in the optimized minimum economic scale for fuel cycle infrastructure will not be made without firm demand and sufficient long-term firm contracts for HALEU. To the extent contracts are awarded by DOE that can help to support such investment, this would facilitate the development of new domestic commercial-scale HALEU production capacity.

055-2

Potential Commercial HALEU Supply:

In Section 1.0.5.1, at p. 1-9, DOE states: "UUSA has submitted a license amendment application to the NRC to increase their enrichment limits to less than 10% enriched uranium utilizing an existing cascade hall at the NEF in Eunice, New Mexico (UUSA, 2023a)." By way of update, Urenco USA Inc. notes that in March 2024, UUSA's application was accepted by NRC for formal review, and the NRC expects to complete that review by November 2024.

055-3

Uranium Enrichment to HALEU:

In Section 2.1.3, at p. 2-12, DOE describes the UUSA facility in Eunice, New Mexico, and states that the facility "is currently licensed to enrich uranium to 5% in U-235." Under its original

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T: +1 (703) 465 8110 | F: +1 (703) 465 2784 | W: www.urenco.com

055-1 DOE acknowledges your support for the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

055-2 DOE acknowledges your support for the Proposed Action and interest in developing a reliable and adequate domestic supply of HALEU. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD and Section 1.1 of the EIS for further discussions of DOE's purpose and need. DOE's Proposed Action is intended to address the underlying dilemma of how to coordinate the development for a supply HALEU with the concurrent development of the reactors that demand its availability.

055-3 Thank you for your comment. The EIS was updated to reflect the information regarding the status of activities at UUSA.

Commenter No. 55 (cont'd): Mary Neumayr, Urenco USA Inc.

license, the UUSA facility was approved to enrich uranium up to 5% U-235 for use in the manufacture of nuclear fuel for commercial power plants. Urenco USA Inc. notes that in 2020, UUSA's license was modified by NRC to increase the site's enrichment limit from 5% up to 5.5% U-235.

In Section 2.1.3 at p. 2-12, DOE also references UUSA's existing six cascade halls. Urenco UUSA Inc. notes that UUSA's existing cascade halls are built to house up to twelve (rather than eight) cascades. Currently, the UUSA facility has 64 operating cascades housed in three buildings, each of which includes two cascade halls. In July 2023, Urenco announced plans to increase the UUSA site's capacity by adding around 700,000 SWU/year in low enriched uranium (LEU) production capacity, an approximately 15% expansion. *See* press released available at Urenco's first capacity expansion to be at its US site | News | Urenco (issued July 6, 2023). This expansion is authorized under the UUSA site's existing license and will include adding eight new cascades to one of UUSA's existing cascade halls, with the first new cascades coming online in 2025.

055-3 (cont'd)

Additional Comments:

Urenco USA Inc. concurs with DOE's bounding estimate in the Draft EIS for its Proposed Action with regard to feed material and estimated SWU required for production of HALEU enriched to up to 19.75% U-235. In particular, DOE for its Proposed Action "assumed HALEU production rate of 50 MT per year, 75 MT of HALEU as UF6 would be produced from 3,100 MT of UF6 [about 2,100 MT of uranium] per year as feed material, and require about 2.2 million SWUs per year." (See Vol. 1, p. 3-13). For DOE's estimate for a facility producing 38 MT of HALEU (e.g. at p. 3-13), Urenco USA Inc. estimates that at a 0.25 tails assay, 38 MT of HALEU would require about 1,600 MTU of UF6 as feed material (total mass of 2,400 MT) and require about 1.6 million SWUs per year to enrich to 19.75 weight percent HALEU.

Thank you again for the opportunity to comment on DOE's Draft EIS. We would be pleased to provide DOE with any additional information that may be useful. If you have any questions, or if additional information would be helpful, please do not hesitate to contact me at (571) 243-3778 (mobile) or by email at mary.neumayr@urenco.com.

Sincerely,

Mary Neumayr

Mary Neumayr
Director, Government Affairs
Urenco USA Inc.

Urenco USA Inc.
1700 N. Moore Street | Suite 1705 | Arlington | VA 22209 | USA
T: +1 (703) 465 8110 | F: +1 (703) 465 2784 | W: www.urenco.com

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Commenter No. 56: Christopher Yesmant, U.S. Environmental Protection Agency

From: Yesmant, Christopher (he/him/his)
To: HALEU-EIS
Cc: Johnson, Casey; Barger, Cindy (she/her/hers)
Subject: [EXTERNAL] EPA Comments on the Draft EIS for HALEU CEQ No 202240037
Date: Monday, April 22, 2024 4:23:06 PM
Attachments: Signed_EPA Comments on the Draft EIS for HALEU_CEQ No 202240037.pdf

Dear Mr. Lovejoy,

The U.S. Environmental Protection Agency reviewed the referenced Draft Environmental Impact Statement for Activities in Support of Commercial Production of high-assay low-enriched uranium (CEQ No: 20240037) in accordance with Section 309 of the Clean Air Act (CAA) and Section 102(2)(C) of the National Environmental Policy Act (NEPA).

The Department of Energy (DOE) proposes to procure high-assay low-enriched uranium (HALEU) from commercial sources over a ten-year period and to facilitate the establishment of commercial HALEU fuel production. The Draft EIS evaluates multiple related activities to predict impacts, including extraction and recovery of uranium; conversion, enrichment and deconversion; transportation; and storage.

I am attaching our comment letter which contains our recommendations for the final EIS and subsequent NEPA analysis. We appreciate the opportunity to review this Draft EIS and look forward to our review of the Final. If you have any questions or would like to meet to discuss our recommendations, please feel free to reach out to me or anyone else on the project review team.

Sincerely,

Christopher Yesmant
NEPA Compliance Division
Office of Federal Activities
U.S. Environmental Protection Agency
Washington, DC
Office: 202-564-4772

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Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

OFFICE OF FEDERAL ACTIVITIES
WASHINGTON, D.C. 20460

OFFICE OF POLICY

April 22, 2024

Mr. James Lovejoy
DOE EIS Document Manager
Office of Nuclear Energy, Department of Energy
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415

Dear Mr. Lovejoy:

The U.S. Environmental Protection Agency reviewed the referenced Draft Environmental Impact Statement for Activities in Support of Commercial Production of high-assay low-enriched uranium (CEQ No: 20240037) in accordance with Section 309 of the Clean Air Act (CAA) and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The CAA Section 309 role is unique to the EPA. It requires the EPA to review and comment on the environmental impact of any proposed federal action subject to NEPA's environmental impact statement requirements and to make its comments open to the public.

The Department of Energy (DOE) proposes to procure high-assay low-enriched uranium (HALEU) from commercial sources over a ten-year period and to facilitate the establishment of commercial HALEU fuel production. The Draft EIS evaluates multiple related activities to predict impacts, including extraction and recovery of uranium; conversion, enrichment and deconversion; transportation; and storage. The Draft EIS evaluates the Proposed Action and No Action Alternative and identifies the Proposed Action as the Preferred Alternative.

Review Summary

The EPA identified public health, welfare, or environmental quality concerns and deficiencies in the analysis that the EPA recommends be addressed in the Final EIS. Our review of the Draft EIS identified several overarching concerns.

056-1

First, predicted impacts were incorporated by reference from 37 different NEPA analyses with publication dates ranging from 1977 to 2022. Although incorporation by reference is warranted to

056-1 The Proposed Action does not include selecting site-specific locations; site-specific locations are expected to be proposed in the future and would be evaluated by the cognizant regulatory agency, in many cases the Nuclear Regulatory Commission (NRC). Because the Proposed Action involves numerous actions (e.g. mining, enrichment, deconversion, etc.) and does not propose to select site-specific locations, given the potential possibilities of all actions and locations, it would not be reasonable to accumulate and assess operating and environmental data for all potential activities. DOE acknowledges the lack of site-specific locations in its EIS and consistent with 40 C.F.R. 1502.21 includes a detailed explanation, in the EIS, Appendix A, and the Technical Report (Leidos, 2023) of the credible information that its analysis is based on as well as the research and evaluation methodologies used by DOE to extrapolate reasonably foreseeable impacts.

Additionally, monitoring and environmental data may not accurately reflect future potential impacts because existing sites likely have legacy characteristics that are not reflective of future construction and/or operational related potential environmental consequences given changes in regulatory requirements and operating technologies. For example, the Mine Safety and Health Administration limit of worker exposures to less than 4 working-level months per year. (The working-level month is when human lungs have been exposed for 170 hours [a typical month's work] to air which has 3.7 kBq of radon-222.) Mine operators have instituted improved mine ventilation systems and the use of personal protective equipment to reduce worker exposures to below these limits. In response to comments about legacy impacts, DOE has added a new Section A.1.3.12, "Legacy Health Issues," to Volume 2, and Section 2.4, "Legacy Issues," to the Comment Response Document (CRD) to provide additional information.

The EIS used the latest NEPA analysis for certain potential sites, and surrogates for others, to allow SMEs to predict the potential impacts from the use of the resources for production of HALEU. See Appendix A and the referenced Technical Report (Leidos, 2023). The Final EIS has been updated to include specific links to the appropriate sections of the Technical Report (Leidos, 2023), which provide more detailed analyses of the bases for the conclusions, especially those conclusions where the impacts were judged by the SMEs and supporting NEPA analyses to be "small."

The Technical Report did not consider long-term monitoring reports at existing facilities to document baseline conditions. Since decisions on specific locations of facilities are not being made in the EIS, providing extensive affected environment

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

streamline the NEPA process, the document does not adequately summarize the applicable issues for this project as recommended in the Council of Environmental Quality NEPA Implementing regulations (40 CFR 1501.11(b)). The EPA recommends using operating and environmental data and information available from mining and processing sites that would provide a more accurate and current assessment of actual environmental impacts than predictions made at the time of publication of the various NEPA analyses incorporated by reference.

056-1 (cont'd)

In addition, the EPA is concerned that the intensity of impacts (i.e., Nuclear Regulatory Commission (NRC) impact assessment categories) may not represent the full range of impacts that could occur as most impacts fall within the "small to moderate" categories.

056-2

Further, communities with environmental justice concerns were not adequately analyzed, and it appears that no meaningful outreach was conducted, as directed by Executive Order 14096 Revitalizing Our Nation's Commitment to Environmental Justice for All (April 26, 2023). The attached detailed comments include recommendations for these topics, among others, to strengthen the assessment of impacts.

056-3

In the Draft EIS, the DOE estimates, because of the proposed actions, that by 2035, the domestic demand for HALEU could be 50 metric tons (MT) per year (MT/yr) and could increase to 500 MT/yr by 2050. The EPA is therefore concerned that reasonably foreseeable impacts as a result of this estimated demand are not adequately addressed in the Draft EIS. To this end, the EPA recommends that all reasonably foreseeable direct and indirect impacts associated with the predicted demand, are discussed at least qualitatively in the Final EIS.

056-4

Finally, the Draft EIS incorporates 37 NRC NEPA analyses by reference, adopts NRC impact assessment categories, cites NRC as the responsible agency that would prepare subsequent NEPA analyses for connected actions, and assumes that NRC regulations for siting, construction, and operation of new uranium fuel cycle facilities would be followed regardless of the site. As such, we recommend that the Final EIS discuss NRC's involvement and clearly distinguish if NRC assisted in the development of the EIS and concurs with the subsequent actions attributed to them. It is also unclear if the NRC was a Cooperating Agency for the EIS or was otherwise consulted or involved.

056-5

The EPA appreciates the opportunity to review the Draft EIS and looks forward to reviewing the Final EIS. If you have any questions, please contact Mr. Christopher Yesmant, the lead reviewer for this project, at (202) 564-4772 or by email at Yesmant.Christopher@epa.gov.

Sincerely,

Robert Tomiak
Director
Office of Federal Activities

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

information in the body of the EIS or appendices was determined to not provide concise and informative information to the potential impact analysis approach and is included or referenced in the Technical Report only. Affected environment information is included where it aids in the understanding of the potential for MODERATE and LARGE impacts.

The Final EIS has been updated (see Sections S.4.2, 3.0.1, and Vol. 2, Appendix A) to more clearly indicate the approaches used by the SMEs to characterize the potential impacts. The scope of this EIS reflects the procurement of up to 290 MT of HALEU from commercial sources over a ten year period of performance and facilitating the establishment of a HALEU fuel cycle. This EIS is not selecting locations or processes/technologies that may be employed by the commercial suppliers. The existing NEPA evaluations were utilized in order to provide a representative range of potential environmental consequences using the best available information.

Appendix A discusses how the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors, who are SMEs in their respective fields, used their education, working knowledge, experience, and professional judgement to extrapolate the potential environmental consequences associated with the Proposed Action.

Throughout Appendix A, and as now added to Volume 1 of the EIS, the reader is directed to the supporting 500+-page Technical Report (Leidos, 2023). The Technical Report is available to review through the project website. This Technical Report (Section 1.1.2, "Existing NEPA Documentation," and Section 10, "References") documents the review of existing NEPA documentation for constructing and operating uranium fuel cycle facilities. The detailed information contained in the Technical Report was not included in the body of the EIS or appendices because the authors wanted to (1) facilitate a clear and concise presentation of the important aspects of the Proposed Action and associated potential environmental consequences and (2) minimize sorting through the enormous amount of technical information reviewed in the existing NEPA evaluations. References to the Technical Report have been added to the Final EIS to highlight for readers where additional support and underlying bases for conclusions in the EIS can be found.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

streamline the NEPA process, the document does not adequately summarize the applicable issues for this project as recommended in the Council of Environmental Quality NEPA Implementing regulations (40 CFR 1501.11(b)). The EPA recommends using operating and environmental data and information available from mining and processing sites that would provide a more accurate and current assessment of actual environmental impacts than predictions made at the time of publication of the various NEPA analyses incorporated by reference.

056-1 (cont'd)

In addition, the EPA is concerned that the intensity of impacts (i.e., Nuclear Regulatory Commission (NRC) impact assessment categories) may not represent the full range of impacts that could occur as most impacts fall within the "small to moderate" categories.

056-2

Further, communities with environmental justice concerns were not adequately analyzed, and it appears that no meaningful outreach was conducted, as directed by Executive Order 14096 Revitalizing Our Nation's Commitment to Environmental Justice for All (April 26, 2023). The attached detailed comments include recommendations for these topics, among others, to strengthen the assessment of impacts.

056-3

In the Draft EIS, the DOE estimates, because of the proposed actions, that by 2035, the domestic demand for HALEU could be 50 metric tons (MT) per year (MT/yr) and could increase to 500 MT/yr by 2050. The EPA is therefore concerned that reasonably foreseeable impacts as a result of this estimated demand are not adequately addressed in the Draft EIS. To this end, the EPA recommends that all reasonably foreseeable direct and indirect impacts associated with the predicted demand, are discussed at least qualitatively in the Final EIS.

056-4

Finally, the Draft EIS incorporates 37 NRC NEPA analyses by reference, adopts NRC impact assessment categories, cites NRC as the responsible agency that would prepare subsequent NEPA analyses for connected actions, and assumes that NRC regulations for siting, construction, and operation of new uranium fuel cycle facilities would be followed regardless of the site. As such, we recommend that the Final EIS discuss NRC's involvement and clearly distinguish if NRC assisted in the development of the EIS and concurs with the subsequent actions attributed to them. It is also unclear if the NRC was a Cooperating Agency for the EIS or was otherwise consulted or involved.

056-5

The EPA appreciates the opportunity to review the Draft EIS and looks forward to reviewing the Final EIS. If you have any questions, please contact Mr. Christopher Yesmant, the lead reviewer for this project, at (202) 564-4772 or by email at Yesmant.Christopher@epa.gov.

Sincerely,

Robert Tomiak
Director
Office of Federal Activities

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

2

056-2 The Final EIS has been updated to clearly indicate how the SMEs evaluated the existing NEPA documents, and also includes updates to the potential impacts discussions. Since the potential impacts could occur from a range of facilities (including existing, brownfield, and greenfield sites), the impacts were evaluated by SMEs and presented in the ranges used by the primary regulatory authority, the Nuclear Regulatory Commission (NRC). As explained in the EIS, given the large number of potential activities and locations, and the direction in 40 C.F.R. 1502.1 to focus on "significant environmental impacts," the potential impacts analysis in Volume 1 of the EIS concentrates on those impacts expected to be MODERATE or LARGE. SMALL impacts are highlighted in the impact summary tables accompanying each activity in Volume 1; however, the bases for and further discussion of small impacts are primarily located in the Technical Report (Leidos, 2023). The Final EIS has been updated with links to the appropriate sections of the Technical Report (Leidos, 2023).

The primary regulator of uranium fuel cycle activities is the NRC. Therefore, the existing or ongoing NEPA evaluations utilized for this EIS were, or are being, prepared, predominantly, by the NRC under its implementing regulations and requirements. For the present EIS, DOE adopted the impact terminology most frequently used by NRC (small, moderate and large). As explained in the EIS, site-specific locations are expected to be proposed in the future and applications for those activities would be evaluated by the cognizant regulatory agency, which in many cases would be the Nuclear Regulatory Commission (NRC). Those future analyses would be expected to include site-specific analysis including environmental baselines and facility/location-specific impact analysis.

For purposes of the present EIS, and as discussed in Appendix A, the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors extrapolated the potential environmental consequences associated with the Proposed Action. In general, the Proposed Action represents a smaller scale level of activity and footprint compared to the activities and footprints evaluated in the existing NEPA evaluations. For example, the amount of uranium needed to produce 50 MT per year of HALEU is approximately 12% of the amount of uranium used in the United States to supply commercial reactors that operate using LEU; the requirements for HALEU commercialization would be about 20% of the conversion capacity of the analyzed Metropolis facility; and HALEU enrichment would require 1.1 million separative work units (SWUs) per year, which is 37% of the analyzed 3 million SWUs capacity of the Urenco USA facility. The relatively smaller scale was factored into the SMEs' evaluations and reflected in the impact assessment categories identified in this EIS.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

streamline the NEPA process, the document does not adequately summarize the applicable issues for this project as recommended in the Council of Environmental Quality NEPA Implementing regulations (40 CFR 1501.11(b)). The EPA recommends using operating and environmental data and information available from mining and processing sites that would provide a more accurate and current assessment of actual environmental impacts than predictions made at the time of publication of the various NEPA analyses incorporated by reference.

056-1 (cont'd)

In addition, the EPA is concerned that the intensity of impacts (i.e., Nuclear Regulatory Commission (NRC) impact assessment categories) may not represent the full range of impacts that could occur as most impacts fall within the "small to moderate" categories.

056-2

Further, communities with environmental justice concerns were not adequately analyzed, and it appears that no meaningful outreach was conducted, as directed by Executive Order 14096 Revitalizing Our Nation's Commitment to Environmental Justice for All (April 26, 2023). The attached detailed comments include recommendations for these topics, among others, to strengthen the assessment of impacts.

056-3

In the Draft EIS, the DOE estimates, because of the proposed actions, that by 2035, the domestic demand for HALEU could be 50 metric tons (MT) per year (MT/yr) and could increase to 500 MT/yr by 2050. The EPA is therefore concerned that reasonably foreseeable impacts as a result of this estimated demand are not adequately addressed in the Draft EIS. To this end, the EPA recommends that all reasonably foreseeable direct and indirect impacts associated with the predicted demand, are discussed at least qualitatively in the Final EIS.

056-4

Finally, the Draft EIS incorporates 37 NRC NEPA analyses by reference, adopts NRC impact assessment categories, cites NRC as the responsible agency that would prepare subsequent NEPA analyses for connected actions, and assumes that NRC regulations for siting, construction, and operation of new uranium fuel cycle facilities would be followed regardless of the site. As such, we recommend that the Final EIS discuss NRC's involvement and clearly distinguish if NRC assisted in the development of the EIS and concurs with the subsequent actions attributed to them. It is also unclear if the NRC was a Cooperating Agency for the EIS or was otherwise consulted or involved.

056-5

The EPA appreciates the opportunity to review the Draft EIS and looks forward to reviewing the Final EIS. If you have any questions, please contact Mr. Christopher Yesmant, the lead reviewer for this project, at (202) 564-4772 or by email at Yesmant.Christopher@epa.gov.

Sincerely,

Robert Tomiak
Director
Office of Federal Activities

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

2

056-3 The Final EIS has been updated to clearly indicate environmental justice impacts (in Sections 3.1.11, 3.3.8, A.1.3.11, and A.3.3.7) and outreach discussions (in Sections 1.2 and 1.3). The environmental justice impacts were evaluated to the extent practicable based on existing analysis for sites, and surrogates for others, to allow SMEs to predict the potential impacts of the Proposed Action. In addition, links are provided throughout these sections to the appropriate portions of Appendix A and the referenced Technical Report (Leidos, 2023) for the detailed analysis.

The EIS identified and discussed the most recent guidance including, but not limited to, Tribal interactions, environmental justice, and global warming. However, decisions regarding site-specific location of facilities are not being made in this EIS. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). With no specific sites identified, analyses were high level and not site-specific; however, DOE made various efforts to provide opportunities for and encourage public participation, and fully considered public input. DOE expects further outreach would be conducted as a part of any site-specific NEPA analysis.

Despite not knowing specific locations of facilities or the exact processes or technologies that might be used, to ensure meaningful outreach without this information, DOE focused its outreach efforts on communities historically affected by the nuclear industry, to include environmental justice communities near existing nuclear facilities and Tribal communities. This effort included identifying and notifying all federally recognized Tribes, populations with proximity to federal and commercial nuclear industrial sites, and populations with proximity to uranium mines to inform them about the Proposed Action and methods to participate in the EIS process. Environmental justice populations at existing nuclear facilities were determined by extracting previously identified environmental justice populations from existing NEPA documents for LEU facilities (see environmental justice sections in the Technical Report). That analysis was then reviewed from a lens of current federal policies (i.e., Executive Order [EO] 14096) and used to help DOE make a good-faith effort to include environmental justice communities into the outreach plan without site-specific information.

Outreach included the following:

- During both the scoping and public comment period, DOE identified physical and digital newspaper outlets with proximity to commercial enrichment, conversion, deconversion, and fuel fabrication sites to distribute information about upcoming meetings and comment mechanisms. These locations included Illinois, Ohio, North Carolina, Idaho, Tennessee, Virginia, and Nebraska. Notices were also distributed to states historically impacted by uranium mining and milling, which included state-wide coverage in Wyoming, Texas, Arizona, New Mexico, Colorado, and Utah.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

streamline the NEPA process, the document does not adequately summarize the applicable issues for this project as recommended in the Council of Environmental Quality NEPA Implementing regulations (40 CFR 1501.11(b)). The EPA recommends using operating and environmental data and information available from mining and processing sites that would provide a more accurate and current assessment of actual environmental impacts than predictions made at the time of publication of the various NEPA analyses incorporated by reference.

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During the public comment period, this notification list was expanded to include notifications near DOE National Laboratories and newspaper distributors specific to Tribal communities. In addition to the previously listed placements, these notices were placed in South Dakota, Washington DC, Oklahoma, California, Nevada, and Washington, as well as regional placements in the Pacific Northwest and several national placements.

- During both the scoping and public comment period, DOE posted press releases announcing the availability of the NOI, Draft EIS, and supporting documents as well as formal comment mechanisms and upcoming engagement opportunities. These press releases were amplified through stakeholder notifications and shared on the Office of Nuclear Energy (DOE-NE) social media platforms such as Facebook, LinkedIn, and X (formerly Twitter). As a part of the stakeholder notifications, newspaper notices and social media posts were accompanied by email notifications to potential stakeholders interested in the nuclear industry. The HALEU electronic mailing list was compiled using internal DOE and publicly available NEPA stakeholder mailing lists. Formal Tribal leader letters and emails were also distributed to all 574 federally recognized Tribes. These notifications communicated to Tribal leaders the availability of the Draft EIS, the mechanisms to submit comments, opportunities to initiate government-to-government consultation, as well as provided information about three upcoming Tribal Listening Sessions. Additional outreach was also conducted with Tribes that previously expressed interest in the DOE-NE's HALEU program.
- During both the scoping and public comment period, DOE hosted three consecutive virtual public meetings to accommodate participation on a national scope and across time zones. In addition to three public hearings, DOE also hosted two virtual Tribal Listening Sessions and one in-person Tribal listening session during the public comment period. The in-person Tribal listening session was held in cooperation with an existing Tribal conference with national attendance to increase participation and attendance of Tribes.
- During both the scoping and the public comment period, DOE ensured that all virtual meetings and Tribal listening sessions had a call-in number to facilitate participation if internet access was intermittent or not available. Public meetings also included American Sign Language interpreters and Zoom's autogenerated closed captioning for those with hearing impairments. During both scoping and the public comment period, DOE posted recordings of the virtual public hearings and Tribal listening sessions on the project website for additional access to project information. Public meetings were also uploaded with Spanish closed captioning for linguistically isolated communities. In consideration of the additional time required to translate and upload Spanish closed captioning, DOE allowed for a 45-day comment period to accommodate commenters who were dependent on translation services.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

streamline the NEPA process, the document does not adequately summarize the applicable issues for this project as recommended in the Council of Environmental Quality NEPA Implementing regulations (40 CFR 1501.11(b)). The EPA recommends using operating and environmental data and information available from mining and processing sites that would provide a more accurate and current assessment of actual environmental impacts than predictions made at the time of publication of the various NEPA analyses incorporated by reference.

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056-5

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Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

056-4 The Purpose and Need was carefully developed to reflect the direction provided by Congress in the Energy Act of 2020 and the limited scope of DOE's Proposed Action. Section 2001(a) of the Energy Act of 2020 charges the Secretary of Energy with establishing and carrying out, through DOE-NE, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use. The Proposed Action specifically addresses Section 2001(a)(2)(D)(v) of the Energy Act of 2020 which calls for the acquisition of HALEU produced by a commercial entity using enrichment technology and making it available for commercial use or demonstration projects. To fulfill this direction, DOE proposes to procure, over a 10-year period of performance, up to 290 MT of HALEU from the commercial sector—an amount that it believes will be sufficient to facilitate a domestic, commercial HALEU fuel cycle. The EIS addresses the impacts associated with the amount proposed for procurement under the Proposed Action (a maximum of 290 MT). The future need estimates reflect publicly available information and were included for transparency and background, but amounts produced beyond the 290 MT would be dependent on additional commercial undertakings (the specifics of which are highly speculative at this juncture), and therefore are not part of the Proposed Action impact analysis. The EIS and the Technical Report provide a qualitative discussion of the reasonably foreseeable direct and indirect impacts related to the Proposed Action.

056-5 The Final EIS has been updated to clearly indicate NRC's role in implementing the license requests for new or modified facilities that might support DOE's procurement of up to 290 MT of HALEU and commercialization of a domestic HALEU fuel cycle. Each time the EIS mentions adopting NRC impact assessment categories, footnotes have been added to clearly state the NRC was not a cooperating agency in the EIS. DOE coordinated with the NRC early in the process, and asked NRC whether it would like to participate in the EIS. NRC declined to do so, in part because it would be responsible for reviewing forthcoming license requests from commercial entities and wanted to maintain its independence at this stage of the process. As a point of interest, the NRC did not provide any comments on the Draft EIS.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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Analytical Approach

Incorporation by Reference

The Draft EIS relies on 37 previous NEPA analyses to predict the impacts of establishing a domestic HALEU fuel cycle. We support streamlining efforts when referenced documents are reasonably available and their content is briefly described, as required by 40 CFR 1501.12. We appreciate the links provided in Appendix B and the brief description of the NEPA projects; however, with the high number of analyses incorporated by reference, page numbers and summaries of specific impacts are needed to assist the reader in retrieving the analyses and understanding the information presented in the EIS.

056-6

> ***Recommendation for the Final EIS***: Provide a summary and brief descriptions of specific impacts as well as page numbers to assist readers in locating referenced information across the 37 NEPA analyses incorporated by reference.

Intensity of Impacts

Upon reviewing the Draft EIS, the EPA is concerned that the intensity of impacts (i.e., Nuclear Regulatory Commission [NRC] impact assessment categories) is not fully captured. We recognize that the Draft EIS uses previous NEPA documents to predict impacts; however, most predicted impacts appear to be of lesser intensity and fall within the "small to moderate" categories. While we understand that the use of existing facilities and certain other related activities could result in small to moderate impacts, we are concerned that activities such as mining are largely categorized in the same manner. For example, 16,000 acres of land use for conventional mining is categorized as small to moderate. In addition, the Draft EIS notes that mining site-specific conditions and land-disturbing activities "are transient in nature" (p. 3-6); however, the EPA notes that impacts can last several decades to hundreds of years. While we understand the Draft EIS is not selecting specific locations or facilities and highlights that site-specific impacts would vary, EISs are required to "provide full and fair discussion of significant environmental impacts" (40 CFR 1502.1). The use of NRC's impact assessment categories obscures which reasonably foreseeable impacts may be significant.

056-7

> ***Recommendation for the Final EIS***: Revise the intensity of impacts for all related activities to provide full and fair discussion of significant environmental impacts.

Affected Environment and Existing Conditions

The Draft EIS incorporates draft and final NEPA documents with dates ranging from 1977 to 2022 to address environmental consequences (Volume II p. B-4); however, no specific information is provided about whether the environmental impacts predicted in these NEPA documents have/have not occurred. The NEPA documents predict impacts and are not an adequate substitute for data and information from mining, processing and ISR operations that have been operating for years. Data from such operations would provide an assessment of actual environmental impacts that is more accurate than the potentially outdated predictions that were used. By observing existing environmental conditions and how they have changed over time, future changes to environmental resources as proposed (e.g., facility modification to meet HALEU requirements, new mining sites) can be more accurately predicted for the proposed action.

056-8

056-6 The Final EIS has been updated to clearly indicate how the SMEs evaluated the existing NEPA documents and updated the potential impacts discussions. The Analytical Approach, specifically the use of existing NEPA evaluations, and Information are described in the Summary and Volumes 1 and 2 of this EIS. Additionally, Appendix A discusses that the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. Throughout Appendix A, a reader is directed to the supporting 500+-page Technical Report (Leidos, 2023). Each of the tables in Appendix A also has a footnote that directs the reader to the appropriate section of the Technical Report for more details on the relevant NEPA documentation for the type of facility being evaluated. The Technical Report is available to review through the project website.

The Final EIS has been updated to include specific links to the appropriate section of the Technical Report (Leidos, 2023) which provides more detailed analyses of the bases for the conclusions, especially those conclusions where the impacts were judged by the SMEs and supporting NEPA analyses to be "small." The Final EIS has also been revised to include the approach and reference to the Technical Report in the Summary and Volumes 1 and 2 to provide the reader with a better understanding of how the authors of the EIS used the information from existing NEPA documents to estimate impacts for the Proposed Actions' HALEU fuel cycle activities.

The Technical Report documents the review of existing NEPA documentation for constructing and operating uranium fuel cycle facilities and provides descriptions and details of specific impacts. This information was not included in the body of the EIS or appendices because the authors wanted to (1) facilitate a clear and concise presentation of the key aspects of the Proposed Action and associated potential environmental consequences and (2) minimize sorting through the enormous amount of technical information reviewed in the existing NEPA evaluations. References to the Technical Report have been added to the Final EIS to highlight for readers where additional support and underlying bases for conclusions in the EIS can be found.

As indicated in the Technical Report, to estimate the potential environmental consequences of the Proposed Action, the authors of the EIS analyzed the best available information (i.e., existing environmental analysis documentation) prepared in accordance with NEPA, for the construction and operation of facilities that currently conduct or are capable of conducting activities that would be similar to those expected to occur under the Proposed Action. Each chapter of the Technical Report provides information on the existing NEPA documentation reviewed and a discussion on the approach to NEPA analysis for determining the

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056-8

potential environmental consequences using the existing NEPA documentation for the Proposed Action activities (see respective sections, such as Section 1.1.4 for Uranium Mining and Milling, Section 2.14 for Uranium Conversion, Section 3.1.4 for Uranium Enrichment, etc.). This includes defining a region of influence (ROI) for each resource area based on activity and consideration of any permitting and regulatory requirements, best management practices, and standard operating procedures that serve to minimize or avoid adverse impacts on resources.

056-7 Changes were made throughout the Final EIS to improve introduction, discussion, and linking to the Appendix A and the Technical Report, which should help explain how DOE substantiated the impacts conclusions reported in the Summary and Chapter 2 tables. Environmental impact methods and discussions are first presented in Chapter 3, then Appendix A, and ultimately the Technical Report.

The Final EIS has been updated to clearly indicate how the SMEs used the information from existing NEPA documents to estimate impacts for HALEU fuel cycle facilities. Many of the existing or ongoing NEPA evaluations, relied upon in this EIS, were or are being prepared under the NRC implementing regulations and requirements.

The NRC is the regulatory authority primarily responsible for uranium fuel cycle facilities and activities, and NRC has been using and continues to use the defined impact assessment categories (SMALL, MODERATE, and LARGE) to characterize the potential environmental consequences.

As discussed in Appendix A, the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors, who are SMEs in their respective fields, used their education, working knowledge, experience, and professional judgement to estimate the potential environmental consequences associated with the Proposed Action. Despite acknowledging that some of the NEPA documents are older and do not reflect the latest guidance on topics such as environmental justice or climate change, the SMEs determined that these existing NEPA analyses are an appropriate, and by and large, conservative surrogate to determine potential impacts from the Proposed Action. In general, the Proposed Action represents a smaller scale level of activity and footprint compared to the activities and footprints evaluated in the existing NEPA evaluations. For example, the requirements for HALEU commercialization would be about 20% of the conversion capacity of the analyzed Metropolis facility. In addition, HALEU enrichment would require 1.1 million SWUs per year, which is 37% of the 3 million SWUs capacity of the analyzed Urenco USA facility. The relatively smaller scale was factored into the SMEs' evaluations and is reflected in the impact assessment categories identified in this EIS. Specifically related to mining, expansion of ISR

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056-8

or conventional mining operations in existing permitted locations already contain existing infrastructure and similar activities/impacts compared to the activities and footprints evaluated in the existing NEPA evaluations (often evaluating an entirely new facility).

See also response to Comment 056-2.

056-8 The Final EIS has been updated to clearly indicate how the SMEs evaluated the existing NEPA documents and updated the potential affected environments and impacts discussions. The Analytical Approach, specifically the use of existing NEPA evaluations, and Information are described in the Summary and Volumes 1 and 2 of this EIS. Additionally, Appendix A discusses that the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors, who are SMEs in their respective fields, used their education, working knowledge, experience, and professional judgement to estimate the potential environmental consequences associated with the Proposed Action.

In the introduction to Appendix A, and throughout, including footnotes to each of the Appendix A tables, a reader is directed to the supporting 500+-page Technical Report (Leidos, 2023). The Technical Report is available to review through the project website. In addition, the Final EIS has been updated to include specific links to the appropriate section of the Technical Report to provide more detailed analyses of the bases for the conclusions, especially those conclusions where the impacts were judged by the SMEs and supporting NEPA analyses to be "small." This Technical Report documents the review of existing NEPA documentation for constructing and operating uranium fuel cycle facilities and provides support and details for the Final EIS. This information was not included in the body of the EIS or appendices because the authors wanted to (1) facilitate a clear and concise presentation of key aspects of the Proposed Action and associated potential environmental consequences and (2) minimize sorting through the enormous amount of technical information reviewed in the existing NEPA evaluations. References to the Technical Report have been added to the Final EIS to highlight for readers where additional support and underlying bases for conclusions in the EIS can be found. The EIS did not consider site-specific longterm monitoring reports at existing facilities to document baseline conditions or provide site specific affected environment descriptions for the Proposed Action because decisions on specific locations of facilities are not being made in this EIS. However, the Technical Report does consider in the evaluation of impacts that certain levels of resource impacts have occurred as part of construction or is ongoing within existing facility operations. Since decisions on specific location of facilities are not being made in this EIS, providing affected environment information in the body of the EIS or appendices was determined as unreasonable and would not provide concise and

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

An additional concern is the reliance on several Draft NEPA documents. Draft documents have not incorporated public or agency input and it is unknown whether the draft NEPA document would have been substantially changed to reflect changes in the project and/or impacts based on comments.

Recommendation for the Final EIS:

- For each resource listed in the EIS, provide an affected environment summary with baseline existing environmental conditions, as required by 40 CFR 1502.15. This should include environmental resource monitoring.
- Delete references to Draft EISs as sources of information, or at least qualify that the drafts may not be an accurate representation of what would be in the final EIS.

056-8 (cont'd)

Purpose and Need

The EPA believes the Draft EIS does not clearly identify the underlying purpose and need of the proposed project (40 CFR 1502.13). The purpose and need should be a clear, objective statement of the rationale for the proposed project, as it provides the framework for identifying project alternatives. The purpose of the proposed action is typically the specific objective(s) of the activity and is essential for defining the range of alternatives to be considered for the project. The need for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity. As presented in the Draft EIS, the DOE's purpose describes that fuel availability for advanced reactors is an important part of a clean energy future and the need for action is that the Energy Act of 2020 directs DOE to support the development of a domestic commercial HALEU fuel cycle (p. 1-13); however, the purpose and need are not explicitly identified, well-defined, well-established, or well-justified.

056-9

***Recommendation for the Final EIS*:** Clearly define the proposed project's purpose and need. Include information that is integral to decisions that are being made about the proposed project design including the forecasted demand for HALEU and anticipated expansion of high-advanced nuclear reactor infrastructure.

Description of the Proposed Action

Section 2.1.1 describes the additional uranium mining and milling that would be needed to support the HALEU program. The section describes how much ore would need to be mined and milled or extracted by ISR and possible locations where this could occur. The section does not discuss the additional wastes and wastewater that would be produced from expanded mining and milling. Further information is needed related to additional wastes produced and how the wastes would be managed under the proposed action in to meaningfully evaluate impacts.

056-10

Recommendation for the Final EIS: Fully describe the additional uranium mining, milling, and ISR activities under the proposed action by including the following information:

- The type and typical characteristics of wastes produced due to additional uranium mining and milling including waste rock, tailings, and wastewater and how these wastes would be managed.
- The type and typical characteristics of wastes produced due to additional ISR activities, including wastewater, and how these wastes would be managed.

informative information to the potential impact analysis, and thus is included or referenced in the Technical Report only. The locations where companies choose to site their facilities would be subject to further environmental analysis under the relevant regulatory authority.

A Draft EIS was only used when a Final EIS had not been issued. An update has been made to the EIS (see Section 3) stating that information based on Draft EISs is preliminary in that it has not undergone public review and that Draft EISs were only used when there was not a corresponding Final EIS.

See also response to Comment 056-1.

056-9 The Final EIS has been updated to clearly indicate how the Purpose and Need section was developed. The Purpose and Need for the Proposed Action is rooted in direction received from Congress via the Energy Act of 2020, specifically Section 2001(a)(2)(D)(v). On a broad level, the Energy Act of 2020 directs DOE to establish and carry out, through DOE-NE, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. Honing in further on the Energy Act provisions, Section 2001(a)(2)(D)(v) specifically directs DOE to consider using enrichment technology to make HALEU available for commercial use or demonstration projects, where such HALEU is produced in the United States by—(I) a United States-owned commercial entity operating United States-origin technology; (II) a United States-owned commercial entity operating a foreign-origin technology; or (III) a foreign-owned entity operating a foreign-origin technology. DOE developed the Proposed Action based on this direction, as well as DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the EIS, DOE has clarified the basis for the estimates of HALEU provided in the EIS. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. Please refer to Section 2.2, "Purpose and Need," of this CRD and Section 1.1 of the EIS for further discussions of DOE's purpose and need. See also the response to Comment 056-4.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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An additional concern is the reliance on several Draft NEPA documents. Draft documents have not incorporated public or agency input and it is unknown whether the draft NEPA document would have been substantially changed to reflect changes in the project and/or impacts based on comments.

Recommendation for the Final EIS:

- For each resource listed in the EIS, provide an affected environment summary with baseline existing environmental conditions, as required by 40 CFR 1502.15. This should include environmental resource monitoring.
- Delete references to Draft EISs as sources of information, or at least qualify that the drafts may not be an accurate representation of what would be in the final EIS.

056-8 (cont'd)

Purpose and Need

The EPA believes the Draft EIS does not clearly identify the underlying purpose and need of the proposed project (40 CFR 1502.13). The purpose and need should be a clear, objective statement of the rationale for the proposed project, as it provides the framework for identifying project alternatives. The purpose of the proposed action is typically the specific objective(s) of the activity and is essential for defining the range of alternatives to be considered for the project. The need for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity. As presented in the Draft EIS, the DOE's purpose describes that fuel availability for advanced reactors is an important part of a clean energy future and the need for action is that the Energy Act of 2020 directs DOE to support the development of a domestic commercial HALEU fuel cycle (p. 1-13); however, the purpose and need are not explicitly identified, well-defined, well-established, or well-justified.

056-9

Recommendation for the Final EIS: Clearly define the proposed project's purpose and need. Include information that is integral to decisions that are being made about the proposed project design including the forecasted demand for HALEU and anticipated expansion of high-advanced nuclear reactor infrastructure.

Description of the Proposed Action

Section 2.1.1 describes the additional uranium mining and milling that would be needed to support the HALEU program. The section describes how much ore would need to be mined and milled or extracted by ISR and possible locations where this could occur. The section does not discuss the additional wastes and wastewater that would be produced from expanded mining and milling. Further information is needed related to additional wastes produced and how the wastes would be managed under the proposed action in to meaningfully evaluate impacts.

056-10

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- The type and typical characteristics of wastes produced due to additional uranium mining and milling including waste rock, tailings, and wastewater and how these wastes would be managed.
- The type and typical characteristics of wastes produced due to additional ISR activities, including wastewater, and how these wastes would be managed.

4

056-10 The Technical Report (Leidos, 2023) includes a discussion of the existing NEPA documentation and the approach for determining the potential environmental consequences using the existing NEPA documentation for the Proposed Action activities. This Technical Report documents the review of existing NEPA documentation for constructing and operating uranium fuel cycle facilities and provides the details in the EPA recommendation for the Final EIS, including discussions of the types of mining and associated waste streams. The Final EIS has been revised to include the approach and reference to the Technical Report in the Summary and Volumes 1 and 2 in more detail to provide a reader with a better understanding of the analytical process and to provide links to the Technical Report throughout the document.

Section 1.1.2, "Description of the Process," of the Technical Report provides detailed information on ISR as well as conventional mining and milling facilities. This includes estimated footprint requirements and construction and operational activities. Section 1.3.4 of the Technical Report provides information on wastewater produced and management of wastewater during construction, operational, and aquifer restoration activities.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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The section 2.1.1 description of uranium mining and milling focuses on the milling part of the activity. Additional information is needed regarding the type of mining that is done and the additional mining that is expected to occur in order to meaningfully evaluate impacts.

056-11

> ***Recommendations for the Final EIS***: Describe the type of uranium mining that is expected to occur by specifying whether the mining would be underground, open pit, or strip mining, or some combination of these.

Alternatives Analysis and Comparison

The alternatives analysis is the "heart" of the environmental impact statement. Agencies are required to present the environmental impacts of the proposal and its alternatives and to rigorously explore and objectively evaluate all reasonable alternatives. The Draft EIS only analyzes the no action alternative and the preferred alternative, and it asserts that "[t]here are no reasonable alternatives that would fulfill the purpose and need for the agency action other than the Proposed Action." DOE estimates that market demand of 8 to 12 MT per year in the 2020s and 50 MT per year in 2035 is needed, but it is unclear how the proposed action is the only reasonable alternative that will satisfy that estimated market demand or will "facilitate the development of the infrastructure that would support the availability of HALEU fuel to support both near-term research and demonstration needs and to support the U.S. commercial nuclear industry". The EPA supports alternative actions that minimize environmental impacts and potential resource use conflicts.

056-12

The NEPA implementing regulations require that the alternatives section "present the environmental impacts of the proposed action and the alternatives in comparative form based on the information and analysis presented in the sections on the affected environment and the environmental consequences" (40 CFR 1502.14(b)). Comparing both the beneficial and adverse environmental impacts of the proposed action will help to sharply define the issues and provide a clear basis for choice among options by the decision-maker and the public. This information is not included in the Draft EIS and currently there is no way compare the proposed action and the no action alternatives.

> ***Recommendation for the Final EIS:*** Explain why no other reasonable alternatives are practical. Present the impacts of the proposed action and the alternatives in comparative form, such as a table, as required by 40 CFR 1502.14

Environmental Justice

Identifying Low-Income and other Communities with EJ concerns

The EPA notes discrepancies in the environmental justice section that may influence predicted impacts in the analysis. Overall, the Draft EIS states that the region of influence of existing sites either do not "have minority or low-income populations or, if present, those populations did not meet or exceed 50% of the geographic population" (p. 2-33). The EPA disagrees with this methodology due to the Council on Environmental Quality's Environmental Justice: Guidance Under the National Environmental Policy Act, which states that a population does not need to meet a 50 percent standard if "the minority population

056-13

056-11 Section 2.1.1 of the Final EIS has been updated to more clearly identify what type of uranium mining was evaluated in the Draft EIS. Further discussion on uranium mining can also be found at Appendix A and Section 1 of the Technical Report. The EIS analysis is based on the latest NEPA evaluation data available and entails certain predictions or extrapolations regarding potential impacts of implementing the Proposed Action, including the impacts of potential mining activities.

As stated within Section 1.1.2 of the Technical Report, the EIS considers two uranium extraction methods: (1) ISR mining, which is the predominant extraction method currently used in the United States for uranium recovery, and (2) conventional mining, which includes open-pit, strip mining, and underground mining, and milling. Decisions on the specific location of facilities and which process or technology will be used are not being made in this EIS. The locations where companies choose to site their facilities and the associated processes or technologies that might be used would be subject to further environmental analysis under the relevant regulatory authority. The Technical Report includes a discussion of the existing NEPA documentation and the approach for determining the potential environmental consequences using the existing NEPA documentation for the Proposed Action activities. This Technical Report documents the review of existing NEPA documentation for constructing and operating uranium fuel cycle facilities and provides the details in the EPA recommendation for the Final EIS, including discussions of the types of mining. The Final EIS has been revised to include the approach and reference to the Technical Report in the Summary and Volumes 1 and 2 in more detail to provide a reader with a better understanding of the analytical process and to provide links to the Technical Report throughout the document.

056-12 Sections 1.02 and 1.1 of the EIS reflect the future need for HALEU. The future need estimates included in the EIS reflect publicly available information and were included for transparency and to provide context for the need. These estimates are based on various assumptions and surveys of reactor developers. The Final EIS has been revised to include these qualifiers to the text on the future need's estimates.

As noted in response to EPA's comments regarding the discussion of Purpose and Need, the Proposed Action—to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent uranium-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production—stems from direction received from Congress via the Energy Act of 2020, specifically Section 2001(a)(2)(D)(v) and DOE's determination that procurement of up to 290 MT over a 10-year period would be sufficient to incentivize development of a commercial HALEU fuel cycle. On a broad level, the Energy Act of 2020 directs DOE to establish and carry out, through DOE-NE, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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The section 2.1.1 description of uranium mining and milling focuses on the milling part of the activity. Additional information is needed regarding the type of mining that is done and the additional mining that is expected to occur in order to meaningfully evaluate impacts.

Recommendations for the Final EIS: Describe the type of uranium mining that is expected to occur by specifying whether the mining would be underground, open pit, or strip mining, or some combination of these.

056-11)

Alternatives Analysis and Comparison

The alternatives analysis is the "heart" of the environmental impact statement. Agencies are required to present the environmental impacts of the proposal and its alternatives and to rigorously explore and objectively evaluate all reasonable alternatives. The Draft EIS only analyzes the no action alternative and the preferred alternative, and it asserts that "[t]here are no reasonable alternatives that would fulfill the purpose and need for the agency action other than the Proposed Action." DOE estimates that market demand of 8 to 12 MT per year in the 2020s and 50 MT per year in 2035 is needed, but it is unclear how the proposed action is the only reasonable alternative that will satisfy that estimated market demand or will "facilitate the development of the infrastructure that would support the availability of HALEU fuel to support both near-term research and demonstration needs and to support the U.S. commercial nuclear industry". The EPA supports alternative actions that minimize environmental impacts and potential resource use conflicts.

056-12

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Recommendation for the Final EIS: Explain why no other reasonable alternatives are practical. Present the impacts of the proposed action and the alternatives in comparative form, such as a table, as required by 40 CFR 1502.14

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056-13

such HALEU available to members of a DOE HALEU consortium by January 1, 2026. Honing in further on the Energy Act provisions, Section 2001(a)(2)(D)(v) specifically directs DOE to consider using enrichment technology to make HALEU available for commercial use or demonstration projects, where such HALEU is produced in the United States by— (I) a United States-owned commercial entity operating United States-origin technology; (II) a United States-owned commercial entity operating a foreign-origin technology; or (III) a foreign-owned entity operating a foreign-origin technology. Further, in its consideration, DOE must take into account "cost and amount of time required and prioritize[e] methods that would produce usable [HALEU] the quickest." Under this direction, DOE developed the Purpose and Need and Proposed Action, and considered if there were reasonable alternatives to the Proposed Action. Given the direction of the Energy Act, the near-term amount of HALEU needed and the timeframe within which DOE seeks to facilitate the commercial HALEU supply chain, DOE did not identify any other action alternative that would meet the Purpose and Need. DOE considered the possibility of downblending HEU to form HALEU, and determined this alternative did not meet the Purpose and Need. Because the EIS Record of Decision (ROD) will not identify specific sites for the HALEU fuel cycle facilities, alternatives evaluating specific sites were not considered. A brief discussion supporting this conclusion has been added to Section 2.4.

The EIS evaluates the Proposed Action and the No Action Alternative and provides a comparison of the two. Under the No Action Alternative, it is assumed that DOE would not procure up to 290 MT or facilitate a HALEU fuel cycle. Based on commercial activities to date, it is reasonable to assume that under the No Action alternative, a domestic, commercial HALEU fuel cycle will not be established in the near future. Therefore, none of the impacts or benefits associated with the Proposed Action would occur, and the environmental impacts of the No Action Alternative would be the status quo. See Sections 2.6.2 and 3.10 of the EIS for the No Action Alternative analysis.

See also response to Comment 056-9.

056-13 Environmental justice impacts were considered to the extent possible given that there are no specific site locations for the HALEU fuel cycle activities (and the ROD will not specify specific sites). DOE understands that much of the existing NEPA documentation available for uranium fuel cycle facilities used the Council of Environmental Quality's (CEQ) 1997 Guidance. This guidance uses both the "meaningfully greater and the 50% threshold." It states, "Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50% or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the

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percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis."[1]

In addition, the incorporated NEPA documents used varying geographic units, of which no analyses used block groups. To best illustrate the presence of a minority population, the EPA recommends DOE use block groups, the smallest geographical unit that the U.S. Census Bureau publishes data for. Using larger tracts as the basis for analysis, such as counties or cities, may dilute the presence of low-income or other populations with EJ concerns. For example, the Draft EIS notes that Cibola County, New Mexico, has a low-income population of 27.3% and indicates that this is not more meaningful than the state percentage (p. 3-9). The EPA notes that the Mt. Taylor Uranium Mine is located within block group 350319440001[2] in Cibola County which has an 80% low-income population and a 99% minority population. The NEPA analysis referenced does not analyze block groups and instead uses census tracts. By using census tracts, this analysis missed the communities with EJ concerns, as discussed above, and therefore, does not provide an accurate environmental justice analysis. As such, scrutiny is needed in the Final EIS to ensure that environmental justice impacts across, as appropriate, the 37 NEPA analyses incorporated by reference accurately represent environmental justice impacts for the proposed project.

Regarding identifying low-income populations, the NEPA Committee of the Federal Interagency Working Group on Environmental Justice has noted that, in some cases, it may be appropriate to use a threshold for identifying low-income populations that exceeds the poverty level.[3] For this Draft EIS, a low-income population may not be accurately recognized by U.S. Census Bureau data as it does not account for states or regions with higher housing costs or other critical family expenses and resources. For example, the California Department of Public Health suggests that "200% of the federal poverty level (FPL) is a more realistic measure of financial hardship than the official 100% FPL" due to California's high cost of living.[4] Therefore, we recommend that DOE considers the adjusting poverty levels in areas where the cost of living is higher.

The Draft EIS incorrectly lists the location of the White Mesa Mill in Garfield County, Utah instead of San Juan County (Volume 2 Appendix A, A-3). The White Mesa Mill has long been a concern of both the adjacent Ute Mountain Tribe and the Navajo Nation, which overlaps a large part of this county. San Juan County is a majority-minority county, made up of a roughly 50% Native American population with

056-13 (cont'd)

[1] Council on Environmental Quality. (1997, December). *Environmental Justice: Guidance Under the National Environmental Policy Act.* **https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf**

[2] U.S. Environmental Protection Agency. (2024, April 1). *EJScreen EPA's Environmental Justice Screening and Mapping Tool (Version 2.2)*. **https://ejscreen.epa.gov/mapper/**

[3] Federal Interagency Working Group on Environmental Justice & NEPA Committee. (2016, March). *Promising Practices for EJ Methodologies in NEPA Reviews*. **https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf**

[4] California Department of Public Health. (2019, April). *Poverty and Health: Healthy Communities Data and Indicators Project, Office of Health Equity (Factsheet)*. **https://data.chhs.ca.gov/dataset/4ea80791-c308-4026-8a94-0e9070b53929/resource/ea66eef9-d854-4792-a587-636579780481/download/hci-one-page-poverty-fact-sheet-june-2019-lm.pdf**

general population or other appropriate unit of geographic analysis." The 2016 Environmental Justice Interagency Working Group Promising Practices Informal guidance indicates both are acceptable. There is no other recent guidance.

To the extent possible, the authors of the EIS have updated the analysis in Appendix A based on EPA's recommendations and made any necessary corresponding changes to the impacts analysis in the EIS. However, given the variety of information available in the existing NEPA analyses that DOE relied on in the Technical Report, DOE was only able to update the analysis to a certain extent, as follows:

- For conversion, deconversion, and storage, DOE presented NEPA document conclusions when site locations could not be determined. In some cases, (i.e., where NEPA documents had performed environmental justice analysis), DOE relied upon the 50% threshold so as to not change published analysis.
- For mining and milling and fuel fabrication, multiple potential locations were noted. The analysis focused on locations of current facilities. Due to the number of potential facilities, DOE used updated demographic information based on city, county, and state, but was not able to reasonably use block groups. Therefore, the Final EIS added a statement that by not using block groups, the analysis may mischaracterize the presence of communities with environmental justice concerns.
- For enrichment, DOE was able to update the demographic data by using current U.S. Census data for block groups and counties at three potential locations. DOE compared the block group to the county for minority and low-income populations. Any block group that exceeded the county was considered minority or low income if the population percentage was meaningfully greater. Also, DOE used terms and definitions contained in the 2021 EO 14008, *Tackling the Climate Crisis at Home and Abroad* and 2023 EO 14096, *Revitalizing our Nation's Commitment to Environmental Justice for All*.

For enrichment, block groups were compared to the county and determined to be minority or low income if the block group exceeded the county. A meaningfully greater analysis using 15% was also conducted and findings were presented in Section A.3.3.7. Impact conclusions were updated. For the UUSA facility in Eunice, New Mexico, none of the block groups would be considered minority compared to one block group using the 50% analysis. One block group was determined to exceed the county for low-income population but was found not to be meaningfully greater than the county. For the Centrus Site in Piketon, Ohio, three block groups would be considered minority compared to none using the 50% analysis with two block groups meaningfully greater. For low-income populations, four rather than six block groups would be considered low income. One block group is not meaningfully

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the poorest-per-capita ranking in Utah[5]. The Draft EIS includes White Mesa as a potential uranium source and lacks discussion of the environmental justice concerns for this region and the historical inequities experienced by the Ute Mountain Utes.

Recommendations for the Final EIS:

- Apply the CEQ's guidance that a community with EJ concerns may be present if the percentage of persons of color in the affected area is meaningfully greater than the percentage in the general population, whether State or national. Adjust the impacts assessment as needed using this standard.
- Identify that former NEPA analyses do not use block groups and address that this may misrepresent or mischaracterize the presence of communities with EJ concerns.
- Consider an adjusted federal poverty level for projects that occur in states or regions with a higher cost of living.

Analyzing Risk

E.O. 12898 was supplemented by E.O.14096, Revitalizing Our Nation's Commitment to Environmental Justice for All (April 26, 2023), which directs federal agencies to identify, analyze, and address disproportionate and adverse human health or environmental burdens and risks on communities with environmental justice concerns. The EPA notes that the Draft EIS does not analyze potential risks of HALEU spent nuclear fuel (SNF) existing or new facilities other than the two existing consolidated interim storage facilities (in Texas and New Mexico). While according to the Draft EIS, the two existing facilities would have capacity for the added HALEU SNF (290 MT), this doesn't address risks associated with the added storage, especially for overburdened communities with environmental justice concerns.

The Draft EIS assumes that spent HALEU fuel storage and disposition will occur at future consolidated storage facilities but until a federal government repository is established, all interim reactor facility storage for spent fuel and waste must be utilized indefinitely (p. 2-34). We recognize that the NRC 2014 final rule on the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor concluded that indefinite storage is not expected to adversely impact communities with environmental justice concerns for continued storage of spent nuclear fuel (10 CFR 51.23), but this does not assess added risks from the 290 metric tons of spent HALEU fuel newly generated by this project and the storage facility modifications required to manage it.

In addition, it is unclear how the reasonably foreseeable extended spent fuel storage terms would be negotiated with existing and new host communities. DOE's consent-based siting process for spent nuclear fuel management relies on negotiated agreements that establish set time limits in which a community agrees to host "interim" spent fuel storage, including conditions for term extensions[6] It is

056-13 (cont'd)

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[5] U.S. Environmental Protection Agency. (2020, November). *Environmental Justice Analysis for the U.S. EPA Region 8 Safe Drinking Water Act Underground Injection Control and Aquifer Exemption Actions for the Dewey-Burdock Uranium In-Situ Recovery Project in the Southern Black Hills Region of South Dakota.* **https://www.epa.gov/sites/default/files/2020-11/documents/db_ej_analysis_nov_24_2020_with_map.pdf**

[6] U.S. Department of Energy. (2023, April). *Consent-Based Siting Process for Federal Consolidated Interim Storage of Spent Nuclear Fuel*. **https://www.energy.gov/ne/us-department-energy-consent-based-siting-process-federal-consolidated-interim-storage-spent**

greater than the county. For the GLE Site in Wilmington, North Carolina, four rather than two block groups would be considered minority. Low- income populations changed from three to four of block groups. One block group is not meaningfully greater than the county. DOE's Energy Justice Mapping Tool, Disadvantaged Communities Reporter, also identifies areas as disadvantaged including among other factors, areas with high housing costs. The EIS was also updated to identify areas with a higher cost of housing, so that once locations are known, such information can be utilized by the relevant regulatory authority to consider poverty levels for environmental justice analysis.

Figure 2.1-1 has been updated in the Final EIS to reflect both San Juan County (White Mesa Mill) and Garfield County (Shootaring Canyon Mill, which announced this past April 2024 plans to restart operations). Appendix A has also been updated to reflect White Mesa Mill is located in San Juan County.

056-14 The storage of SNF is a reasonably foreseeable activity resulting from the implementation of the Proposed Action, but a detailed analysis of such activity, at this time, would be speculative given the lack of sitespecific details. DOE did analyze this activity to the extent possible at this juncture. As stated in Section 3.7.3.4 of the EIS, the total HALEU SNF generated by the implementation of the Proposed Action could contain 290 metric tons (MT) of HALEU. This is 0.8% of the 40,000 MT uranium analyzed in the NRC EIS for storage at the proposed ISP consolidated interim storage facilities (CISF) in Andrews County, Texas, and 3.4% of the 8,680 MT uranium analyzed in the NRC EIS during the first phase of the proposed Holtec CISF in Lea County, New Mexico. In addition, this is 0.4% of the 86,584 MT heavy metal of SNF in the United States inventory from 2021. Regardless, any HALEU SNF that might eventually be generated would be a very small addition to existing commercial power reactor SNF, it would not add substantially to the overall impacts of managing and dispositioning SNF, including those impacts related to environmental justice. Additionally, the path forward for the management of SNF is evolving and, in most cases, involves temporary demonstrated safe storage at the generating locations. This current reality is discussed in the EIS. Decisions on the specific location of facilities, including those associated with any SNF that might be generated in the future, is not being made in this EIS. The locations where companies choose to site their facilities would be subject to further environmental analysis under the relevant regulatory authority. The Technical Report (Leidos, 2023) includes a discussion of the existing NEPA documentation and the approach for determining the potential environmental consequences using the existing NEPA documentation for the Proposed Action activities.

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unclear what existing community siting agreements have been made for existing spent fuel storage facilities and whether extension conditions have been established and if those conditions have been met.

Recommendations for the Final EIS:

- As required by E.O. 14096, analyze environmental risk for the storage of HALEU at existing or new facilities.
- Disclose any existing and planned community-based agreements made with stakeholders, including extended-term waste storage contingency planning to ensure prioritization of the needs and concerns of impacted communities (e.g., consensus-based siting agreements, community participation plans, etc.). As part of this disclosure, list any community concerns regarding the storage of HALEU and how the DOE has responded to those concerns.

056-14 (cont'd)

Meaningful Public Engagement

E.O. 14096 directs federal agencies to provide opportunities in the NEPA process for early and meaningful involvement for communities with environmental justice concerns that may be potentially affected by a proposed action. One of DOE's strategies for integrating environmental justice into the NEPA process is by increasing capacity within communities to ensure early and meaningful involvement.[7] The Draft EIS did not discuss whether meaningful public engagement had been conducted. In the past, uranium mining has resulted in concerns for communities with environmental justice concerns; therefore, it is important that meaningful public engagement is conducted.

Recommendations for the Final EIS:

- Disclose all environmental justice community outreach efforts.
- Summarize comments and any significant issues from EJ communities submitted during the scoping process.
- If meaningful outreach has not yet occurred, conduct these efforts prior to publishing the Final EIS and incorporate community feedback into the final document. This may include, but is not limited to:
  - Providing translation services to accommodate linguistically isolated populations, as applicable.
  - Addressing technology barriers that may prohibit participation from affected communities.
  - Ensuring that meetings are scheduled at a time and location that is accessible for community participants, including scheduling meetings after work hours and on weekends as appropriate and providing opportunities for hybrid meetings.
  - Providing ample notice of meetings and commenting opportunities so that community members have sufficient time to prepare and participate.
  - Promoting engagement opportunities within appropriate outlets used by affected communities, such as newspapers, radio, and social media.

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[7] U.S. Department of Energy. (January 2017). *Environmental Justice Strategy.* **https://www.energy.gov/lm/articles/environmental-justice-strategy-january-2017**

While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to spent fuel management and interim storage capabilities. As a part of this initiative, and as the agency responsible for managing the nation's nuclear waste, DOE is committed to a consent-based approach to siting a waste management system that enables broad participation and centers equity and environmental justice. Again, the Consent-Based Siting Consortia activities are not covered by the scope nor is the consortia specific to the HALEU EIS. More information, including public concerns related to interim storage is available to review on DOE's websites (https://www.energy.gov/ne/consent-based-siting).

056-15 The Final EIS has been updated to clearly indicate environmental justice impacts (in Sections 3.1.11, 3.3.8, A.1.3.11, and A.3.3.7) and outreach (in Sections 1.2 and 1.3) discussions. Section 1.2 of the EIS was updated to describe linguistic and technological accommodations made during the scoping period and scoping meetings, and Section 1.3 was added to describe the activities conducted during the public comment period, to address EPA's recommendations and concerns.

Due to the lack of site-specific information for this program, it was not possible to identify environmental justice communities on a national scale. To ensure meaningful outreach without this information, DOE focused its outreach efforts on communities historically affected by the nuclear industry, to include environmental justice communities near existing nuclear facilities and Tribal communities.

The EIS identified and discussed the most recent guidance including, but not limited to, Tribal interactions, environmental justice, and global warming. However, decisions regarding site-specific location of facilities are not being made in this EIS. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). With no specific sites identified, analyses were high level and not site-specific; however, DOE did its best under the circumstances to provide timely opportunities for members of the public to share information and concerns, fully considered the public input, sought out and encouraged public involvement, and provided assistance, tools, and resources to assist public participation. DOE expects further outreach would be conducted as a part of any site-specific NEPA analysis.

Despite not knowing specific locations of facilities or the exact processes or technologies that might be used, DOE made a good-faith effort to communicate with all communities, including communities with environmental justice concerns and communities historically marginalized by the uranium industry. This effort included identifying and notifying all federally recognized Tribes, populations with proximity to federal and commercial nuclear industrial sites, and populations with proximity to uranium mines to inform them about the project and methods

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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unclear what existing community siting agreements have been made for existing spent fuel storage facilities and whether extension conditions have been established and if those conditions have been met.

Recommendations for the Final EIS:

- As required by E.O. 14096, analyze environmental risk for the storage of HALEU at existing or new facilities.
- Disclose any existing and planned community-based agreements made with stakeholders, including extended-term waste storage contingency planning to ensure prioritization of the needs and concerns of impacted communities (e.g., consensus-based siting agreements, community participation plans, etc.). As part of this disclosure, list any community concerns regarding the storage of HALEU and how the DOE has responded to those concerns.

056-14 (cont'd)

Meaningful Public Engagement

E.O. 14096 directs federal agencies to provide opportunities in the NEPA process for early and meaningful involvement for communities with environmental justice concerns that may be potentially affected by a proposed action. One of DOE's strategies for integrating environmental justice into the NEPA process is by increasing capacity within communities to ensure early and meaningful involvement.[7] The Draft EIS did not discuss whether meaningful public engagement had been conducted. In the past, uranium mining has resulted in concerns for communities with environmental justice concerns; therefore, it is important that meaningful public engagement is conducted.

Recommendations for the Final EIS:

- Disclose all environmental justice community outreach efforts.
- Summarize comments and any significant issues from EJ communities submitted during the scoping process.
- If meaningful outreach has not yet occurred, conduct these efforts prior to publishing the Final EIS and incorporate community feedback into the final document. This may include, but is not limited to:
  - Providing translation services to accommodate linguistically isolated populations, as applicable.
  - Addressing technology barriers that may prohibit participation from affected communities.
  - Ensuring that meetings are scheduled at a time and location that is accessible for community participants, including scheduling meetings after work hours and on weekends as appropriate and providing opportunities for hybrid meetings.
  - Providing ample notice of meetings and commenting opportunities so that community members have sufficient time to prepare and participate.
  - Promoting engagement opportunities within appropriate outlets used by affected communities, such as newspapers, radio, and social media.

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to participate in the EIS process. Environmental justice populations near existing nuclear facilities were determined by extracting previously identified environmental justice populations from existing NEPA documents for LEU facilities (see environmental justice sections in the Technical Report). That analysis was then reviewed from a lens of current federal policies (i.e., EO 14096) and used to help DOE make a good-faith effort to include environmental justice communities into the outreach plan without site specific information.

Outreach included the following:

- During both the scoping and public comment period, DOE identified physical and digital newspaper outlets with proximity to commercial enrichment, conversion, deconversion, and fuel fabrication sites to distribute information about upcoming meetings and comment mechanisms. These locations included Illinois, Ohio, North Carolina, Idaho, Tennessee, Virginia, and Nebraska. Notices were also distributed to states historically impacted by uranium mining and milling, which included state-wide coverage in Wyoming, Texas, Arizona, New Mexico, Colorado, and Utah. During the public comment period, this notification list was expanded to include notifications near DOE National Laboratories and newspaper distributors specific to Tribal communities. In addition to the previously listed placements, these notices were placed in South Dakota, Washington DC, Oklahoma, California, Nevada, and Washington, as well as regional placements in the Pacific Northwest and several national placements.
- During both the scoping and public comment period, DOE posted press releases announcing the availability of the NOI, Draft EIS, and supporting documents as well as formal comment mechanisms and upcoming engagement opportunities. These press releases were amplified through stakeholder notifications and shared on DOE-NE social media platforms such as Facebook, LinkedIn, and X (formerly Twitter). As a part of the stakeholder notifications, newspaper notices and social media posts were accompanied by an email blast to potential stakeholders interested in the nuclear industry. The HALEU electronic mailing list was compiled using internal DOE, notification lists as well as publicly available NEPA stakeholder mailing lists. Formal Tribal leader letters and emails were also distributed to all 574 federally recognized Tribes. These notifications communicated to Tribal leaders the availability of the Draft EIS, the mechanisms to submit comments, opportunities to initiate government-to-government consultation, as well as provided information about three upcoming Tribal Listening Sessions. Additional outreach was also conducted with Tribes that previously expressed interest in DOE-NE's HALEU program.

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- During both the scoping and public comment period, DOE hosted three consecutive virtual public meetings to accommodate participation on a national scope and across time zones. In addition to three public hearings, DOE also hosted two virtual Tribal Listening Sessions and one in-person Tribal listening session during the public comment period. The in-person Tribal Listening Session was held in cooperation with an existing Tribal conference with national attendance to increase participation and attendance of Tribal communities.
- During both the scoping and the public comment period, DOE ensured that all virtual meetings and Tribal Listening Sessions had a call-in number to facilitate participation if internet access was intermittent or not available. Public meetings also included American Sign Language interpreters and Zoom's autogenerated closed captioning for those with hearing impairments.
- During both scoping and the public comment period, DOE posted recordings of the virtual public hearings and Tribal Listening Sessions on the project website for additional access to project information. Public meetings were also uploaded with Spanish closed captioning for linguistically isolated communities. In consideration of the additional time required to translate and upload Spanish closed captioning, DOE allowed for a 45-day comment period to accommodate commenters who were dependent on translation services.

During scoping, commenters did not identify themselves based on environmental justice qualifications, except in scenarios where comments were being submitted on behalf of a Tribe. Thus, making it difficult to identify whether a commenter qualified as an environmental justice community. However, most comments from Tribes highlighted DOE's responsibility to adhere to Section 106 of the National Historic Preservation Act and other applicable permits when performing construction, operation, and/or modification of HALEU facilities. Additionally, Tribal members requested comment extensions and for physical copies of the Draft EIS, when available. All Tribal comment extensions and physical copy requests were granted, and a section on DOE's limitations to participate in Section 106 consultation due to a lack of site specific information was added to Section 6.1, "Consultations."

Individual commenters who included environmental justice concerns in their submissions typically requested meaningful outreach with Indigenous Peoples, especially in regard to mining and milling and the wastes associated with those activities. Another commenter was concerned about health impacts caused by enrichment activities at the American Centrifuge Plant in Piketon, Ohio. The EIS addresses both of these topics in Section 1.3, "DOE Notice of Availability for the Draft EIS and Opportunity for Comment on the Draft EIS," and Table A-3, "Uranium Enrichment – Impact Assessments for the Proposed Action by Resource Area,"

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in Appendix A, respectively. Another commenter asked how social equities and constructive engagement with disadvantaged communities would occur for the Centrus Demonstration Project. Current Centrus activities have undergone environmental review and licensing process with NRC (Docket No. 70-7004), and if Centrus were to undertake future activities related to the Proposed Action, DOE would expect that it would include meaningful engagement with disadvantaged communities as a part of its follow on environmental review process.

The Natural Resource Defense Council (NRDC) and the EPA Office of Radiation and Indoor Air (ORIA) submitted conflicting comments. NRDC requested that Section (a)(2)(D)(vi) of the Energy Act of 2020 which states, "The program shall consider options for acquiring ... HA-LEU ... that does not require extraction of uranium or development of uranium from lands managed by the Federal Government, cause harm to the natural or cultural resources of Tribal communities or sovereign Native Nations, or result in degraded ground or surface water quality on publicly managed or privately owned lands," be more clearly included in DOE's messaging. While EPA-ORIA requested the EIS should closely examine potential for new uranium production on Tribal or Tribal adjacent lands. Regarding both comments, Section (a)(2)(D)(vi) of the Energy Act of 2020 is not prohibitive. Instead, it requests DOE to consider options that do not affect these land type scenarios. With this in mind and to ensure DOE's analysis was bounded by any potential location scenario, DOE analyzed, at a high-level, mining impacts of both new and existing mines across all land types (i.e., at existing uranium facilities, brownfield sites, and greenfield sites), to include Tribal lands. This analysis relies on the information presented in the Uranium Leasing Program Programmatic Environmental Impact Statement (DOE/EIS-0472) which was extrapolated for HALEU activities and can be found in in Chapter 1, Uranium Mining and Milling, of the Technical Report (Leidos, 2023).

EPA-ORIA also submitted comments which encouraged consultation and coordination with Tribal governments. At this time, DOE has received two government-to-government consultation requests from the Morongo Band of Mission Indians and from the Agua Caliente Band of Cahuilla Indians. Tribal recommendations made pursuant to those consultations will be included in Section 6.1, "Consultations," of the Final EIS. EPA-ORIA also requested that the EIS address legacy impacts of uranium production on Tribal lands. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices.

Please see Section 4.0, "Scoping Comment Summary," of Volume 3 for a summary of comments received during the scoping period.

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Transportation of Hazardous and Radioactive Materials

The Draft EIS does not describe-or evaluate impacts from the transportation of uranium products associated with HALEU production as the potential modes of transportation, routes, and final destinations for these products have yet to be determined. The Draft EIS presents cumulative transportation-related radiological doses and latent cancer fatalities starting in 1943 and estimated to 2090 but does not address the consequences of such an accident or potential spill of radiological materials (p. 4-3). The EPA is concerned about shipments of hazardous materials to and from the facilities associated with HALEU production, especially considering that HALEU-specific transportation and storage casks are currently in development and not available for hazard analysis (p. 2-17).

Leakage or spillage from accidents or mishandling when transporting hazardous materials may pose major threats to property, safety, and environmental degradation. The Final EIS provides a forum to fully analyze and disclose all risk reduction strategies.

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Recommendations for the Final EIS:

- Prepare an accident analysis along transportation routes for the example facilities used in this NEPA analysis, identifying both the probability and consequences of a maximum reasonably foreseeable accident. Characterize the degree to which buildings, land, and environmental media or biota would be contaminated from an accident. Describe direct and indirect effects associated with potential cleanup activities.
- Describe measures in place to protect the public and workers from potential radiological exposure to ensure safe an uneventful transport of offsite shipments.
- As much as is feasible, we recommend developing a Transportation Risk Assessment that estimates the magnitude of risks presented and identifies a choice among alternative routes with the lowest risk.[8]

Consultation with Tribes

The Draft EIS states that DOE relies on past consultations completed for existing facilities (p. 6-1) and defers consultations to site-specific NEPA and permits. It will be appropriate to conduct site-specific consultations, but the EPA recommends not deferring consultation associated with DOE's decision regarding the HALEU project. The EPA is concerned that no Tribal consultation was conducted for the proposed action because Tribes have frequently voiced concerns about uranium mining, processing, and related activities. For example, the Navajo Nation have experienced health risks and contamination from uranium mines and currently 523 abandoned mines exist on their reservation.[9] Several Tribes are currently concerned about the reopened Pinyon Plain Mine in Arizona, including transport through the

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056-16 It would not be practical to prepare site-specific accident analysis along transportation routes since specific facility sites are not being proposed or selected by this EIS and ROD. However, a detailed transportation analysis was performed for this EIS. Both radiological and nonradiological transportation impacts are described in Section 3.6, "Transportation," of the EIS and Section A.6, "Transportation," of Appendix A. Radiological impacts are those associated with the effects from low levels of radiation emitted during incident-free transportation and from the accidental release of radioactive materials. Nonradiological impacts are independent of the nature of the cargo being transported and are expressed as traffic accident fatalities resulting only from the physical forces that accidents could impart to humans. Details of the analyses are in Section 6 of the referenced Technical Report (Leidos, 2023). Since the EIS does not identify specific locations for fuel cycle facilities, the EIS transportation analysis used some conservative assumptions about the distances traveled during transportation (considering longest distances between the potential locations/facilities of source and product materials [e.g., mines to conversion, conversions to enrichment, enrichment to fuel fabrication and/or deconversion, and deconversion to storage]). Therefore, the analysis is expected to bound the impacts regardless of where the facilities would be located.

The analysis considered transportation of all forms of uranium materials: from the mines to the mills, from an ISR or mill to the conversion facility, from the conversion facility to enrichment facilities, from the enrichment facility to a deconversion facility, from the deconversion facility to a storage facility, and from the storage facility to the fuel fabrication facility. For the transportation analysis, all facilities were conservatively assumed to be independently sited (i.e., no co-location of facilities).

The human health transportation risk analysis in this EIS incorporates by reference resource conditions and impact considerations of the existing NEPA documentation prepared by the NRC and DOE, as applicable, as referenced in this EIS's Appendix A, Section A.6, "Transportation." For incident-free transportation, the potential human health impacts from the radiation field surrounding the radioactive packages were estimated for transportation workers and populations along the route (termed off-traffic or off-link), people sharing the route (termed in-traffic or on-link), and people at rest areas and stops along the route.

Potential human health impacts from transportation accidents were evaluated. The risks to human health from the radiological nature of the shipments include analyses of various exposure pathways: (1) external exposure to a passing radioactive cloud; (2) external exposure to contaminated ground; (3) internal

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- Describe measures in place to protect the public and workers from potential radiological exposure to ensure safe an uneventful transport of offsite shipments.
- As much as is feasible, we recommend developing a Transportation Risk Assessment that estimates the magnitude of risks presented and identifies a choice among alternative routes with the lowest risk.[8]

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exposure from inhalation of airborne contaminants; and (4) internal exposure from the ingestion of contaminated food (related to potential releases in rural areas). The impact of a specific radiological accident is expressed in terms of probabilistic risk, which is defined as the accident probability (accident frequency) multiplied by the accident consequence. The analysis of accident risks accounts for a spectrum of accidents ranging from high-probability accidents of low severity (e.g., a "fender bender") to hypothetical high-severity accidents that have a corresponding low probability of occurrence.

In the HALEU fuel cycle, the activities in uranium recovery, conversion, and shipments of UF6 to and from enrichment facilities are similar to those of the activities evaluated in the light-water reactors (LWRs) fuel cycle. The transport of the HALEU in the form of UF6 to the fuel fabrication facilities is also similar to those used in the LWRs fuel cycle, but with the use of a criticality modified packaging with lower quantities of enriched uranium per shipment.

For the EIS, the HALEU was assumed to be transported in the certified packages (currently active) such as 30B-20 cylinders for the HALEU hexafluoride, Optimus-L for HALEU oxides, and ES-3100 for HALEU metal. The NRC recently certified Optimus-L for transporting HALEU in TRISO form, which is uranium carbide, and application for uranium oxides would be similar. Attachment A to Section 6 of the Technical Report (Leidos, 2023) provides additional details on the proposed shipping containers. In addition, the Energy Act of 2020 has provisions for the design and certification of packages specifically for the storage and transportation of HALEU.

Table 6-4 of the referenced Technical Report (Leidos, 2023) summarizes the quantitative results of the transportation impacts for the various activities within the HALEU fuel cycle. As shown in this table as well as Table A-7 in Volume 2 of the EIS, the impacts of transporting radioactive materials under the Proposed Action are expected to be SMALL. Overall, there would be a maximum of 380 to 415 annual shipments of various uranium products, and over 1 million km (621,371 miles) traveled annually, covering the activities in various steps between the uranium recovery and storage facility for production of 25 MT of HALEU per year. For a 50 MT HALEU production per, there would be on the average less than three truck transport per day, and about 1.3 million miles of transports per year. The results indicate that it is unlikely the transportation activities under the Proposed Action would lead to a latent cancer fatality among the workers or general populations from radiological exposures in these transports (Leidos, 2023).

Table 4.2-1 of the EIS summarizes cumulative transportation impacts. This table provides the expected total impacts, in terms of total doses received by workers (truck drivers) and the general population, from transportation of various forms of uranium materials for an annual production of 50 MT of HALEU. The population

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doses include both the exposures from incident-free operation and potential accident conditions during transport. To get a better perspective on the cumulative transportation risk, the analysis in Volume 1, Section 4.2, included risks from historical shipments, general radioactive materials transportation that was not related to any particular action, and reasonably foreseeable actions. As shown in Table 4.2-1, the transportation impacts from the Proposed Action are expected to be SMALL and would not substantially contribute to cumulative impacts.

With respect to emergency response, in the event of a radiological release from a shipment along a route, local emergency response personnel would be the first to arrive at the accident scene. It is expected that response actions would be taken in accordance with the guidance in the National Response Framework (DHS, 2019) and the related Nuclear/Radiological Incident Annex (DHS, 2023). Based on the initial assessment at the scene, training, and available equipment, first responders would involve Federal and state resources, as necessary. First responders and/or Federal and state responders would initiate actions in accordance with the U.S. Department of Transportation (DOT) Emergency Response Guidebook (USDOT, 2024) to isolate the incident and perform the actions necessary to protect human health and the environment (such as evacuations or other means to reduce or prevent impacts to the public). Cleanup actions are the responsibility of the carrier.

056-17 DOE is and remains open to government-to-government consultation requests. In the absence of specific site locations, DOE notified all Federally Recognized Tribes through formal Tribal leader letters and emails. These notifications communicated to Tribal leaders the availability of the Draft EIS, the mechanisms to submit comments, opportunities to initiate government-to-government consultation, as well as provided information about the three Tribal Listening Sessions. The goals of these Tribal listening sessions were to listen to Tribal feedback, determine Tribal concerns, address any questions about the Proposed Action, and formally receive Tribal comments on the Draft EIS. At the listening sessions and in DOE's Tribal notification materials, DOE also communicated its willingness to engage in government-to-government consultations.

As a result of the Tribal Listening Sessions, DOE learned of Tribal concerns predominantly surrounding transportation impacts concerning roadside resident populations, legacy mining and milling impacts and ongoing health effects from historic uranium practices, as well as different accessibilities to information. The complete list of Tribal concerns presented during the Tribal Listening Sessions and DOE's formal responses are available in the question and answer portions of each listening session as well as Comments 117 – 131 in this CRD.

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Transportation of Hazardous and Radioactive Materials

The Draft EIS does not describe-or evaluate impacts from the transportation of uranium products associated with HALEU production as the potential modes of transportation, routes, and final destinations for these products have yet to be determined. The Draft EIS presents cumulative transportation-related radiological doses and latent cancer fatalities starting in 1943 and estimated to 2090 but does not address the consequences of such an accident or potential spill of radiological materials (p. 4-3). The EPA is concerned about shipments of hazardous materials to and from the facilities associated with HALEU production, especially considering that HALEU-specific transportation and storage casks are currently in development and not available for hazard analysis (p. 2-17).

Leakage or spillage from accidents or mishandling when transporting hazardous materials may pose major threats to property, safety, and environmental degradation. The Final EIS provides a forum to fully analyze and disclose all risk reduction strategies.

056-16

Recommendations for the Final EIS:

- Prepare an accident analysis along transportation routes for the example facilities used in this NEPA analysis, identifying both the probability and consequences of a maximum reasonably foreseeable accident. Characterize the degree to which buildings, land, and environmental media or biota would be contaminated from an accident. Describe direct and indirect effects associated with potential cleanup activities.
- Describe measures in place to protect the public and workers from potential radiological exposure to ensure safe an uneventful transport of offsite shipments.
- As much as is feasible, we recommend developing a Transportation Risk Assessment that estimates the magnitude of risks presented and identifies a choice among alternative routes with the lowest risk.[8]

Consultation with Tribes

The Draft EIS states that DOE relies on past consultations completed for existing facilities (p. 6-1) and defers consultations to site-specific NEPA and permits. It will be appropriate to conduct site-specific consultations, but the EPA recommends not deferring consultation associated with DOE's decision regarding the HALEU project. The EPA is concerned that no Tribal consultation was conducted for the proposed action because Tribes have frequently voiced concerns about uranium mining, processing, and related activities. For example, the Navajo Nation have experienced health risks and contamination from uranium mines and currently 523 abandoned mines exist on their reservation.[9] Several Tribes are currently concerned about the reopened Pinyon Plain Mine in Arizona, including transport through the

056-17

[8] U.S. Department of Energy. (2002, July). *Recommendations for Analyzing Accidents under the National Environmental Policy Act.* **https://www.energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-DOE-AccidentAnalysis.pdf**

[9] U.S. Environmental Protection Agency. (2024, March 5). *Abandoned Mines Cleanup*. **https://www.epa.gov/navajo-nation-uranium-cleanup/abandoned-mines-cleanup**

To briefly summarize those responses, the transportation analysis reflects information in terms of general population exposure, not individual radiation exposure. The analysis is included in the EIS Chapters 3.6 and 4.2, with supporting details in Appendix A, Section A.6, and Chapter 6 of the Leidos Technical Report. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. DOE also expects that the appropriate regulatory authority would take cumulative health impacts into consideration when site specific information is determined as a part of the follow-on environmental review process. Finally, at these listening sessions DOE was informed of different capabilities of Tribal governments, with emphasis on the loss of Radiation Exposure Compensation Act resources and delays of information to the rest of the Tribal community. While DOE will continue to notify Tribes with formal letters, newspaper notifications, and targeted notifications (i.e., emails, social media posts, etc.), DOE is also working to better communicate and coordinate not only with Tribal governments but also Tribal communities about future projects. In consideration of these concerns, DOE granted additional time to all Tribal extension requests to further encourage perspectives on this program.

At this time, DOE has received two government-to-government consultation requests from the Morongo Band of Mission Indians and from the Agua Caliente Band of Cahuilla Indians. Initially, both Tribes were seeking Section 106 Consultation opportunities with DOE. As noted previously, DOE is not making decisions regarding specific facilities or activities; therefore, DOE is not pursuing activities that are ripe for Section 106 Consultation. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in the authorization of the HALEU activities and will have obligations to comply with applicable environmental and Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies, when necessary. In addition to concerns about the protection of historic and cultural resources, the Morongo Band of Mission Indians requested a physical copy of the HALEU EIS. Their full comments, as well as DOE's formal response can be found under Comment ID 008 in this CRD. In addition to concerns about the protection of historic and cultural resources, the Agua Caliente Band of Cahuilla Indians noted concerns about legacy mining, legacy health impacts, and transportation of radioactive materials through Tribal reservations. Their full comments, as well as DOE's formal response, can be found under Comment ID 221 in this CRD. Further information about consultations has been provided in Section 6.1, "Consultations," in the Final EIS.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

Navajo Nation and proximity to Red Butte.[10] The Draft EIS also states that the proposed action may also have moderate impacts at facilities located near highly significant resources, including Devils Tower and Chaco Canyon National Monuments (Volume 2, p. A-12). Due to historical and current Tribal concerns, potential impacts to cultural and other resources of interest to tribes, and the new proposed strategy, Tribal consultation is needed.

Recommendations for the Final EIS:

- Conduct a formal Tribal consultation prior to Final EIS and the determination of a Record of Decision.
- In the Final EIS, summarize the results of Tribal consultation, names of the Tribes consulted, identify the main concerns expressed by Tribes (if any), and how those concerns were addressed.
- Describe whether Indigenous Knowledge was used in assessing impacts and making decisions, consistent with CEQ/OSTP Guidance.

056-17 (cont'd)

Agencies Regulating Mining

The Draft EIS states that "conventional mining is regulated by the U.S. Department of the Interior, Office of Surface Mining, and the individual states where the mines are located" (p. 2-3). The EPA notes that conventional mining is also regulated by the U.S. Department of Agriculture through the U.S. Forest Service, such as the Pinyon Plain Mine in Arizona. In addition, mines may also require permits from the U.S. Army Corps of Engineers, the EPA, and State agencies.

Recommendation for the Final EIS: Include the U.S. Department of Agriculture, U.S. Army Corps of Engineers, and the EPA to agencies that regulate mining.

056-18

Clean Water Act National Pollutant Discharge Elimination System Analysis

The following comments are specific to Clean Water Act Section 402 and 40 CFR § 122.26(b)(15)(i) National Pollutant Discharge Elimination System (NPDES) permitting regulations authorizing the discharge of stormwater from construction activities on areas upland from a waterbody and not considered a jurisdictional wetland area, regardless of the land's designation as federal, state, Indian country or private.

DOE's Draft EIS indicates they have analyzed construction and operation of new HALEU facilities at existing uranium fuel cycle facilities (through either modification of existing facilities or construction of new facilities), other previously developed industrial (brownfield) sites, and at undeveloped (greenfield) sites. They identify construction, modification and/or augmentation of existing facilities for uranium enrichment facilities, deconversion facilities, and storage facilities.

056-19

[10] Red Butte is a Traditional Cultural Property that is part of the new *Baaj Nwaavjo I'tah Kukveni* (Ancestral Footprints of the Grand Canyon National Monument) and is a sacred site to the Havasupai Tribe. USDA Forest Service photo.

DOE-NE understands and recognizes the importance of Indigenous knowledge in Federal projects and how such knowledge can better shape the findings of environmental reviews, as discussed in CEQ's and the White House Office of Science and Technology Policy's Guidance for Federal Departments and Agencies on Indigenous Knowledge. However, incorporating Indigenous knowledge largely relies upon Federal coordination with Tribes on their interactions and experiences with environmental, cultural, and biotic aspects of a proposed site or surrounding location. Without site-specific information for proposed HALEU activities and facilities, the application of Indigenous knowledge to this EIS was limited. DOE expects that other Federal agencies will be involved in coordinating with Tribes for their perspectives once sites are determined.

056-18 The Final EIS was revised to recognize the U.S. Department of Agriculture, U.S. Forest Service as a regulator of conventional mining on USFS lands.

As noted previously, DOE is not making decisions regarding specific facilities or activities. Therefore Volume 1 of the HALEU EIS discusses permitting in general rather than the myriad of potential permitting requirements for potential HALEU fuel cycle facility locations across the U.S. Some additional details of permitting requirements are discussed in Appendix A of the HALEU EIS, with additional details presented in the supporting Technical Report (Leidos, 2023). Chapter 6 of the Final EIS was revised to describe U.S. Army Corps of Engineers and EPA-related permits.

056-19 As stated in the Draft EIS Summary and Volume 1, site-specific locations are not being selected pursuant to this EIS and ROD. It is expected that specific locations will be determined at a later time and evaluated by the cognizant regulatory authority. Therefore, this EIS does not include the level of detail, such as how the different provisions under the Clean Water Act (CWA) and Clean Air Act (CAA) will be addressed to reduce impacts. However, the Summary and Volume 1 of the EIS do address requirements at a high level and acknowledge that modification, construction, and operation of uranium fuel cycle facilities would be subject to NEPA review as well as other applicable review/permitting such as CWA and CAA permitting, as necessary. Potential impacts analyzed in this EIS were estimated based on impact analyses conducted in previous NEPA reviews, as it was determined that impacts from construction and/or operation of a HALEU facility would be similar to the impacts associated with LEU facilities. Subsequent NEPA evaluations may or may not tier from this EIS. DOE expects the relevant regulatory agency would determine, in accordance with CEQ's requirements at 40 C.F.R. 1501.11 related to tiering, to what extent DOE's EIS could be utilized to support site-specific environmental reviews. Regardless, reference to the CEQ's NEPA regulations related to tiering have been added to the text in both the Summary and Volume 1 of the Final EIS.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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Although the water resources section of the Draft EIS considers water usage and potential spill impacts, potential impacts from stormwater runoff created as result of construction activities and not analyzed.

For 40 CFR § 122.26(b)(15)(i) NPDES regulations (applicable to State NPDES programs, see § 123.25) which authorize the discharge of stormwater from construction activities, all entities associated with a construction project who:

1) Meet the EPA's Construction General Permit (CGP) definition of "operator."
2) Cause an earth disturbance of 1 acre or greater, or less than one acre if part of a larger common plan of development or sale that ultimately disturbs 1 acre or greater.
3) Discharge stormwater from their construction activities (including any on-and off-site construction support activities), are required to obtain NPDES permit coverage via the CGP (if all permit eligibility requirements are met) or other NPDES permit from the EPA prior to beginning construction activities and/or construction support activities.

The EPA's 2022 CGP construction activities definition refers to "earth-disturbing activities, such as the clearing, grading, and excavation of land, and other construction-related activities (e.g., grubbing; stockpiling of fill material; placement of raw materials at the site) that could lead to the generation of pollutants. Some of the types of pollutants that are typically found at construction sites are: sediment; nutrients; heavy metals; pesticides and herbicides; oil and grease; bacteria and viruses; trash, debris, and solids; treatment polymers; and any other toxic chemicals."

Therefore, clearing, grading and excavation of land for any of the project's proposed facilities on areas upland from a waterbody and not considered a jurisdictional wetland area that results in earth disturbance and/or construction support activities (e.g., equipment staging yards, materials storage areas, excavated material disposal areas, laydown areas, etc.), are considered construction-related activities that require NPDES permit coverage.

Additionally, because the overall earth disturbance of this project is greater than 1 acre, the larger common plan of development or sale is triggered at each location, therefore stormwater discharges from all construction activities and on-site or off-site construction support activities (i.e., borrow pits, staging areas, material storage areas, temporary work areas, etc.) are required to obtain NPDES permit coverage via the CGP or other NPDES permit (except any portion of the project's construction activities that is covered by a CWA 404) even if the smaller project's earth disturbance is less than 1 acre at each location.

Recommendation for the Final EIS:

- Discuss whether future NEPA analyses will tier from this EIS, consistent with the Council on Environmental Quality's 2014 Memorandum on Effective Use of Programmatic NEPA Reviews.
- List all applicable federal laws, regulations, executive orders, and other requirements to the proposed action and indicate how relevant provisions will be followed to address potential impacts. For example, how will the different provisions under the Clean Water Act (§ 401, 402, 404, etc.) and Clean Air Act be addressed to reduce impacts? As the Draft

056-19 (cont'd)

Chapter 6 of the Final EIS references CWA Section 404 permitting. This section has been revised to reference the potential need for Section 401 and 402 compliance as well. As previously stated, it is anticipated that specific sites/locations will be determined at a later time, and that applicable review/permitting requirements will be determined then. A table has been added to Chapter 6 that includes a high-level summary of federal requirements that may be relevant to the project.

Analysis of stormwater runoff effects is described in detail in the Technical Report (Leidos, 2023), which is cited in the Final EIS. (In the Technical Report, see Section 1.3.4 and Table 1-4 for ISR, conventional mining, and conventional milling; Section 2.3.2.4 and Table 2-6 for uranium conversion; Section 3.3.4 and Table 322 for uranium enrichment; Section 4.3.5 and Table 4-7 for uranium deconversion; Section 5.3.4 for uranium storage; Section 7.3.4 and Table 7-10 for HALEU fuel fabrication; and Table 8-2 for construction and operation of HALEU-fueled reactors.) The text in the Final EIS has been revised to include details from the Technical Report to better describe these potential effects.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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EIS indicates there will be hazardous materials/wastes associated with project facilities that may be released to the environment due to accidents or other unforeseen events, include in applicable requirements the Clean Air Act §112(r), and, as applicable, the Emergency Planning and Community-Right-To Know Act, EPCRA § 303, 311, & 312, and related state and county regulatory programs.

- Disclose information on anticipated federal, state, and other permits, approvals and authorizations that may be required. The additional information on these authorizations and approvals could include the status of existing permits and/or modifications, those to be obtained and entities to issue them, and measures to ensure protection of human health and the environment. Such information, provided in tabular format, will assist decision-makers and public in understanding risks posed by activities under the proposed action.

056-19 (cont'd)

Affected Environment and Environmental Consequences – Air

The EPA appreciates inclusion of the climate change section in the cumulative effects chapter. There could be other impacts to air quality that should be addressed in this document, particularly related to additional mining and processing operations. These operations produce fugitive dust from blasting, crushing, transportation, exposed mine workings, and waste rock and tailings storage facilities. In addition, chemical emissions result from milling and processing operations. Mining and processing facilities also emit radon and other radioactive emissions. Dust, chemical, and radioactive emissions can impact human health and the environment.

056-20

Recommendations for the Final EIS:

Add air resources as a new subsection in section 3.1, 3.2, 3.3, and other appropriate sections of chapter 3 and describe potential impact to air from fugitive dust, chemical emissions, and radiological emissions.

Affected Environment and Environmental Consequences - Uranium Mining and Milling

The Draft EIS focusses on the impacts due to additional ISR mining since it assumes that additional conventional mining and milling at the White Mesa mill would have impacts that are small in comparison to larger impacts from ISR, partly due to the disturbed nature of the White Mesa site. This approach downplays the environmental impacts that are currently occurring at the White Mesa mill and the additive impacts of potential expansion under the HALEU program including the need for a new or expanded tailings storage facility. This approach ignores potential environmental impacts associated with expanded and longer-term operation of the White Mesa Mill and additional tailings disposal by assuming the impacts would be small. Inclusion of actual data from the White Mesa Mill site is needed to meaningfully evaluate impacts of its continued use and additional tailings produced.

056-21

056-20 The Technical Report (Leidos, 2023) in support of this EIS provides detailed air quality impact analyses for each activity associated with the Proposed Action, as requested in the comment. This detailed information is summarized at a high level in Section 2.6.1.5 to streamline the EIS and maintain Chapter 3's focus on resources with potentially MODERATE and LARGE impacts. Greenhouse gas (GHG) emissions and the social cost of climate change are discussed in cumulative impacts in Section 4.3.2 and summarized in Section 2.7.1.3. Additionally, the text in the Final EIS has been revised to better describe the linkage between the information presented in Volume 1, Appendix A, and the Technical Report. Hot links are provided throughout the Final EIS to directly link the reader to the appropriate sections of the Technical Report that provide the justification for the key air and other impact area conclusions. The air quality affected environment and impacts for each activity in the Technical Report are described in Section 1.3.5 and Table 1-4 for ISR, conventional mining, and conventional milling; in Section 2.4.2.5 and Table 2-6 for uranium conversion; in Section 3.3.5 and Table 3-22 for uranium enrichment; Section 4.3.5 and Table 4-7 for uranium deconversion; Section 5.3.5 for uranium storage; Section 7.3.5 and Table 7-10 for HALEU fuel fabrication; and in Table 8-2 for construction and operation of HALEU fueled reactors.

056-21 The text in the Final EIS has been revised to refer the reader to the Technical Report (Leidos, 2023) for further information regarding the impacts of uranium milling (see last paragraph in new Section 3.0.1). Section 1 of the Technical Report describes the affected environment and impacts for ISR, conventional mining, and conventional milling, and summarizes these impacts in Table 1-4 of the Technical Report. While there is wide variation in the impacts of operations at specific mine sites, specific ISR sites, and the representative milling site (White Mesa Mill), the subject matter experts used all the available data to determine the reasonable projected impacts of the Proposed Action. If the White Mesa mill were utilized, operations would occur within the existing facility and no additional construction activities associated with continued operation, other than the potential construction of new lined tailings impoundments, would be expected. Additional impacts would be considered SMALL across all resource areas due to the disturbed nature of the site.

Impact areas evaluated in the Technical Report for conventional mining, conventional milling, and ISR include (where data was available) land use, visual and scenic resources, geology and soils, water resources, air quality, ecological resources, historical and cultural resources, infrastructure, waste management, noise, public and occupational health-normal, public, and occupational health-facility accidents, traffic, socioeconomics, and environmental justice. For the representative mill site (the White Mesa Mill), the relevant NEPA documents are older NRC EAs that did not evaluate environmental justice, as that topic was not typically evaluated during the timeframe of the EAs.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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Recommendation for the Final EIS:

- Include a discussion of the current impacts of the White Mesa Mill operations on resources in each of the subsections of section 3.1 based on actual monitoring data (groundwater, surface water, air, etc.) and compliance reports.

- Describe potential additional impacts associated with expanding the operation of the White Mesa Mill under the HALEU program including impacts of constructing and operating a new tailings facility (estimated additional land area impacted, and impacts to groundwater, surface water, etc.).

056-21 (cont'd)

Section 3.1.1, Land Use. The land use section does not describe land use impacts associated with conventional mining and milling. Additional mining can result in more land disturbance related to expansion of existing open pits, construction of new open pits and new or expanded waste rock storage facilities. As noted in the comment above, additional milling can result in the need for expanded or new tailings storage facilities. The land use section summarizes impacts from ISR mines as small to moderate but does not include sufficient information to support this conclusion since the information is based on NEPA documents that were prepared prior to ISR construction and operation for existing ISR facilities.

Recommendation for the Final EIS:

- Describe or add a table that shows the existing geographic extent (acreage) of land disturbance at each existing ISR operation that might be used under the HALEU program and estimated additional disturbance that could occur if new ISR operations are needed under the HALEU program. Table A-1 provides estimated disturbance from NEPA documents, but actual disturbance information is more relevant and should be provided.
- Describe or add a table showing the existing geographic extent (acreage) of land disturbance at each existing uranium mine and mill that could be utilized under the HALEU program and the estimated additional disturbance that could occur under the HALEU program should these mines be reopened or continue beyond the current mine life. Table A-1 provides estimated disturbance from NEPA documents, but actual disturbance information is more relevant and should be provided.

056-22

Section 3.1.4 Water Resources. The water resources section does not describe potential impacts to water quality and quantity from mining and milling. It summarizes impacts to water from ISR operations as small to large. Impacts to water resources – both water quality and quantity - from mining activities is often one of the most significant concerns raised by communities and tribes since there have been instances of water management problems at mining operations and some locations could be particularly sensitive to climate change impacts on water balances. Further information is needed to better characterize the affected environment at mining, milling, and ISR facilities, the type of impacts that have and could occur, and potential additional impacts from ongoing, expanded, or new mines under the HALEU program.

056-23

For mining and milling and fuel fabrication, multiple potential locations were noted. The analysis focused on locations of current facilities. Due to the number of potential facilities, updated demographic information based on current U.S. Census Bureau information (American Community Survey Data, 2017 to 2021) published in 2023 for cities, counties, and states was used, but did not present block groups. This analysis included San Juan County compared to the state of Utah, the location of White Mesa Mill. San Juan County was identified as having both minority and low-income populations. As requested by EPA, a statement was added to the EIS that by not using block groups, the analysis may mischaracterize the presence of communities with environmental justice concerns.

Revised sections were added to Chapter 3 and Appendix A that present in detail the Approach to Impact Analyses. In addition, a section was added on legacy issues to the mining and milling section of Appendix A, Section A.1.3.12. In Chapter 2, Section 2.6.1.12, "Human Health Normal Operations Impact Summary," a statement has been added that legacy impacts are not considered as being representative of future operational impacts but, points to the newly added sections.

For the Draft and Final EIS, the goal of the evaluations was to assess the projected impacts supporting the incremental HALEU production if the Proposed Action were implemented. This was done by evaluating the existing NEPA information from the perspective of the current situations and regulations. DOE acknowledges that the White Mesa Mill is now regulated by the State of Utah and while it is highly regulated by the State, it continues to be controversial. The controversy arises from past or legacy practices for both mining and milling and some ongoing practices, including bringing in ore from other places and leaving the residual materials (tailings) at the facility. In June 2023, U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR), Office of Community Health and Hazard Assessment issued a report. The Ute Mountain Ute Tribe asked the Agency to evaluate how radiation and other chemicals related to uranium milling activities at the White Mesa Uranium Mill might affect the health of tribal members. The mill is located next to Ute Mountain Ute Tribe land. For the scenarios that ATSDR were able to evaluate, ATSDR concluded the following:

- Children and adults living in White Mesa are unlikely to be harmed from breathing radiological contaminants in the air. Residential air exposures do not result in elevated risks of adverse cancer or non-cancer health effects from radiological material. Annual doses from airborne radionuclides ranged from 9 to 23 mrem per year.
- Children and adults who drink the water from the Ute Mountain Ute Tribe public water system are unlikely to be harmed from radiological contaminants.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

Recommendation for the Final EIS:

- Include a discussion of the current impacts of the White Mesa Mill operations on resources in each of the subsections of section 3.1 based on actual monitoring data (groundwater, surface water, air, etc.) and compliance reports.

056-21 (cont'd)

- Describe potential additional impacts associated with expanding the operation of the White Mesa Mill under the HALEU program including impacts of constructing and operating a new tailings facility (estimated additional land area impacted, and impacts to groundwater, surface water, etc.).

Section 3.1.1, Land Use. The land use section does not describe land use impacts associated with conventional mining and milling. Additional mining can result in more land disturbance related to expansion of existing open pits, construction of new open pits and new or expanded waste rock storage facilities. As noted in the comment above, additional milling can result in the need for expanded or new tailings storage facilities. The land use section summarizes impacts from ISR mines as small to moderate but does not include sufficient information to support this conclusion since the information is based on NEPA documents that were prepared prior to ISR construction and operation for existing ISR facilities.

Recommendation for the Final EIS:

056-22

- Describe or add a table that shows the existing geographic extent (acreage) of land disturbance at each existing ISR operation that might be used under the HALEU program and estimated additional disturbance that could occur if new ISR operations are needed under the HALEU program. Table A-1 provides estimated disturbance from NEPA documents, but actual disturbance information is more relevant and should be provided.
- Describe or add a table showing the existing geographic extent (acreage) of land disturbance at each existing uranium mine and mill that could be utilized under the HALEU program and the estimated additional disturbance that could occur under the HALEU program should these mines be reopened or continue beyond the current mine life. Table A-1 provides estimated disturbance from NEPA documents, but actual disturbance information is more relevant and should be provided.

Section 3.1.4 Water Resources. The water resources section does not describe potential impacts to water quality and quantity from mining and milling. It summarizes impacts to water from ISR operations as small to large. Impacts to water resources – both water quality and quantity - from mining activities is often one of the most significant concerns raised by communities and tribes since there have been instances of water management problems at mining operations and some locations could be particularly sensitive to climate change impacts on water balances. Further information is needed to better characterize the affected environment at mining, milling, and ISR facilities, the type of impacts that have and could occur, and potential additional impacts from ongoing, expanded, or new mines under the HALEU program.

056-23

Residential drinking water quality reports are within EPA regulatory limits. For radiological water quality standards, these limits have been shown to be protective of human health and are below the ATSDR minimal risk level and were not evaluated further.

The ATSDR recommended that the Ute Mountain Ute Tribe continue to monitor drinking water and collect air, water and soil samples.

That evaluation supports that the air emissions, groundwater contamination, and radiological impacts were well within those initially identified in the NRC NEPA documents and well within the State of Utah standards imposed on the White Mesa Mill.

056-22 As stated in the Reader's Guide of the EIS's Volume 1, Chapter 3 discusses impacts that could potentially be labeled as MODERATE or LARGE, while SMALL impacts are addressed in the appendices. Both Volumes 1 and 2 of the Final EIS have been revised to better incorporate potential impacts associated with ISR and conventional mining and milling. These impacts are discussed in more detail in Section 1.3.1 and Table 14 of the Technical Report (Leidos, 2023). Regarding the listed recommendations, while preparing the Draft EIS, an effort was made to find the existing geographic extent (acreage) of land disturbance at each of the existing ISR and conventional uranium mines that may be used under the Proposed Action, utilizing Federal databases (including NRC and USGS databases), industry websites, and private websites specific to individual mining facilities. Unfortunately, the available information was incomplete or inconsistent. For example, information related to the size of the permitted mining areas or the acreage of active mines within permitted mining locations was not often provided. As a result, the decision was made to identify a typical acreage range for use in the analysis.

056-23 An analysis of water pollutants present at specific locations is beyond the scope of this EIS; however, the Final EIS has been revised to include discussion of specific pollutants found at existing ISR/conventional mines, as analyzed in previous, existing NEPA documents (previous NEPA documents for specific mines are listed in Appendix B).

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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Recommendation for the Final EIS:

- For ISR operations, describe the type of water pollutants that are present (radionuclides, metals, etc.), describe how ISR operations avoid and minimize impacts to water quality, and describe whether there have been impacts to surface water and groundwater quality at operating ISR sites. Estimate potential additional impacts to water quality from expanded ISR operations to justify the small to large conclusion in the EIS.
- For conventional mining and milling operations, describe the type of water pollutants that are present, describe practices used to avoid and minimize impacts to surface and groundwater water quality, and describe whether there have been impacts to water quality. Estimate potential additional impacts to water quality from expanded mining and milling operations.
- For conventional mining operations, describe the mine dewatering that occurs which can impact surface water flows and groundwater levels.
- Describe reasonably foreseeable climate effects on the affected environment, climate resilience issues posed by potential climate effects on the Proposed Action, and any effects of the proposed action that may be magnified by climate change.

056-23 (cont'd)

Greenhouse Gas Emissions and Social Cost for Cumulative Activities Associated with the Proposed Action

CEQ's January 2023 Interim Guidance "National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change" states that agencies generally should quantify gross emissions increases or reductions (including both direct and indirect emissions) individually by GHG, as well as aggregated in terms of total CO2 equivalence. To capture uncertainty around the SC-GHG estimates in analyses, it is also important to present the SC-GHG values for each GHG at the different discount rates. Additionally, in a December 2023 memo, the Office of Management and Budget directed agencies to apply the SC-GHG which "reflect the best available scientific evidence, are most appropriate for particular analytical contexts, and best facilitate sound decision-making." (see https://www.whitehouse.gov/wp-content/uploads/2023/12/IWG-Memo-12.22.23.pdf).

Recommendations for the Final EIS:

- Report GHG emissions for each individual gas (CO2, CH4, and N2O) for the low/high scenarios, in addition to reporting in CO2e.
- Include tables that report the monetized climate change damages separately for each GHG and for the high and low scenarios. Furthermore, DOE should provide sufficient descriptions of data and methods on computing the monetized climate damages to allow them to be reproduced. Since the data and methods used to develop the current estimates were not fully explained, it is not clear how they were calculated.
- Use the recently updated the EPA estimates of the SC-GHG which reflect the best available science for estimating the social value of changes in GHG emission as opposed to the IWG interim SC-GHG values. The IWG values rely on modeling developed over a

056-24

The Final EIS and the Technical Report (Leidos, 2023) have been revised to include a discussion of the effects of mine dewatering (see Volume I, Section 3.1.4, and Volume 2, Section A.1.3.4). More detailed information related to water quality/ quantity concerns are presented in Section 1.3.4 and summarized in Table 1-4 of the Technical Report.

Due to the large number of potential activities and unknown facility locations associated with the HALEU fuel cycle, this EIS does not describe specific climate change projections and climate resilience for each potential location. DOE expects that the appropriate regulatory authority will conduct a site-specific analysis at a later time, and that specific climate change projections and climate resilience will be considered in that environmental review.

056-24 A new detailed section on greenhouse gas emissions calculations, including Tables A-12 through A-15, has been added to the Final EIS as Volume 2, Section A.8. All GHGs estimated as a result of implementation of the Proposed Action would occur from the combustion of gasoline, diesel, or natural gas in construction and operational equipment, trucks, or worker commuter vehicles. Roughly 99% of the carbon dioxide equivalent emitted from these sources would occur in the form of CO2 (USEPA, 2024). Hence, reporting each individual GHG, including CH4 and N2O emissions, would not substantially add to the precision of the project CO2e emission calculations.

The Final EIS (Volume 2, Section A.8, along with Tables A-16 and A-17) includes revised project social cost of GHG estimates as requested in the comment, based on EPA's updated 2023 methodology. An explanation of and the worksheets for this analysis are presented in the Final EIS's Appendix A, Section A.8.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

decade ago and are based on underlying scientific assessments that are significantly older in some cases. As explained in detail in the analyses accompanying the EPA's 2023 Oil and Gas final rule, the updated SC-GHG estimates represent a major step forward in bringing SC-GHG estimates closer to the frontier of climate science and economics and address near-term updating recommendations from the National Academies' (2017). The EPA's updated SC-GHG estimates have been through public comment and received a favorable external expert peer review. See https://www.epa.gov/environmental-economics/scghg for more details.

056-24 (cont'd)

Climate Adaptation

Section 4.3.2.1 of the Draft EIS states that "as part of the NEPA process to site these specific activities, the environmental review should identify climate adaptation measures that would mitigate the effects of climate change on proposed HALEU activities at these locations".

- Consistent with the CEQ National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change, the EIS should describe reasonably foreseeable climate effects on the affected environment, climate resilience issues posed by potential climate effects on the Proposed Action, and any effects of the proposed action that may be magnified by climate change.
- The EPA also recommends the existing and expanded discussion of these issues in the Final EIS be updated using the 5th National Climate Assessment.

056-25

Site-Specific Impacts for Future Associated NEPA Analyses

The EPA understands that site-specific impacts from the related activities would be addressed in future NEPA analyses. The EPA offers recommendations below to address critical information needed.

Recommendations for future site-specific analyses related to the proposed action, consider the following:

Transportation

- Identify alternatives to and impacts from proposed routes for each project.
- Include the probability and consequences of a transportation accident involving radiological materials, convey potential risks and impacts to human health and the environment from exposure to such materials, identify and consider alternate transportation routes having the fewest potential impacts on communities with environmental justice concerns, and discuss options for containing or remediating a release from a transportation-related accident or spill.
- Consider identifying alternative routes to avoid communities with environmental justice by using the EPA's EJScreen and conducting enhanced outreach, as discussed above in the "Meaningful Public Engagement" section.

056-26

056-27

056-25 Due to the large number of potential activities and unknown facility locations associated with the HALEU fuel cycle, this EIS does not describe specific climate change projections and climate resilience for each potential location. DOE expects that the appropriate regulatory authority will conduct a site-specific analysis at a later time, and that specific climate change projections and climate resilience will be considered in that environmental review. However, Section 4.3.2 of the Final EIS has been updated to include data and analyses available from the 5th National Climate Assessment.

056-26 Decisions on the specific location of facilities are not being made in this EIS; therefore, site-specific alternative routes are not evaluated in the EIS. However, the locations where companies site their facilities would be subject to further environmental analysis by the relevant regulatory authority, and additional transportation analysis would be expected at that time.

For this EIS, the Technical Report (Leidos, 2023) includes a discussion of the existing NEPA documentation and the approach for determining the potential environmental consequences using the existing NEPA documentation for the Proposed Action activities. The Final EIS has been revised to include a direct link to the portion of the Technical Report (Section 6) that addresses transportation.

USDOT regulates the transportation of hazardous materials in commerce by land, air, and water. USDOT specifically regulates the carriers of radioactive materials and activities related to transport, such as routing, handling and storage, and vehicle and driver requirements. NRC regulates the packaging and transportation of radioactive material for its licensees, including transportation by commercial shippers of radioactive materials.

DOE—through its management directives, orders, and contractual agreements—ensures the protection of public health and safety by imposing a variety of requirements and standards for transportation activities done by or on behalf of DOE, incorporating the requirements and standards of USDOT and NRC and establishing that all Departmental shipments achieve an equivalent level of safety to that required by DOT and NRC.

The analyzed transportation routes in all of the incorporated NEPA analyses were generated using an Oak Ridge National Laboratory route selection computer program software (i.e., TRAGIS, or Web-TRAGIS), which is a geographic information system-based transportation analysis computer program used to identify the highway, rail, and waterway routes for transporting radioactive materials within the United States. The features in this software allow users to determine routes for shipment of radioactive materials that conform to USDOT regulations as specified in 49 C.F.R. Part 397 (or "highway route-controlled quantities" [HRCQ]). All of the

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

decade ago and are based on underlying scientific assessments that are significantly older in some cases. As explained in detail in the analyses accompanying the EPA's 2023 Oil and Gas final rule, the updated SC-GHG estimates represent a major step forward in bringing SC-GHG estimates closer to the frontier of climate science and economics and address near-term updating recommendations from the National Academies' (2017). The EPA's updated SC-GHG estimates have been through public comment and received a favorable external expert peer review. See https://www.epa.gov/environmental-economics/scghg for more details.

056-24 (cont'd)

Climate Adaptation

Section 4.3.2.1 of the Draft EIS states that "as part of the NEPA process to site these specific activities, the environmental review should identify climate adaptation measures that would mitigate the effects of climate change on proposed HALEU activities at these locations".

- Consistent with the CEQ National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change, the EIS should describe reasonably foreseeable climate effects on the affected environment, climate resilience issues posed by potential climate effects on the Proposed Action, and any effects of the proposed action that may be magnified by climate change.
- The EPA also recommends the existing and expanded discussion of these issues in the Final EIS be updated using the 5th National Climate Assessment.

056-25

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The EPA understands that site-specific impacts from the related activities would be addressed in future NEPA analyses. The EPA offers recommendations below to address critical information needed.

Recommendations for future site-specific analyses related to the proposed action, consider the following:

Transportation

- Identify alternatives to and impacts from proposed routes for each project.
- Include the probability and consequences of a transportation accident involving radiological materials, convey potential risks and impacts to human health and the environment from exposure to such materials, identify and consider alternate transportation routes having the fewest potential impacts on communities with environmental justice concerns, and discuss options for containing or remediating a release from a transportation-related accident or spill.
- Consider identifying alternative routes to avoid communities with environmental justice by using the EPA's EJScreen and conducting enhanced outreach, as discussed above in the "Meaningful Public Engagement" section.

056-26

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shipment's routes determined by the TRAGIS/Web-TRAGIS evaluated follow the USDOT transport routing regulations as those for HRCQ; therefore, all shipments of radioactive materials and wastes are considered to fall in this category. The routes were selected to be reasonable and consistent with routing regulations and general practice, but they are representative routes only because the actual routes would be chosen in the future.

Potential human health impacts from transportation accidents were evaluated in this EIS. The risks to human health from the radiological nature of the shipments include analyses of various exposure pathways: (1) external exposure to a passing radioactive cloud; (2) external exposure to contaminated ground; (3) internal exposure from inhalation of airborne contaminants; and (4) internal exposure from the ingestion of contaminated food (related to potential releases in rural areas). The impact of a specific radiological accident is expressed in terms of probabilistic risk, which is defined as the accident probability (accident frequency) multiplied by the accident consequence. The analysis of accident risks accounts for a spectrum of accidents ranging from high-probability accidents of low severity (e.g., a "fender bender") to hypothetical high-severity accidents that have a corresponding low probability of occurrence.

Because of the similarity of the materials that would be transported under the Proposed Action with those used in LWR fuel cycle facilities, the accident analyses and their associated impacts developed in those facility's NEPA documents are considered to be applicable to this EIS, as detailed in Section 6 of the Technical Report (Leidos, 2023). Therefore, this EIS' analysis of accident impacts extrapolates the impacts in the incorporated NEPA documents based on the number of shipments for the specific forms of transported materials.

See also the response to Comment 056-16.

056-27 It would not be practicable to further develop alternative routes since locations are not being proposed or selected by this EIS and ROD. However, a detailed transportation analysis was performed for this EIS, and the Final EIS has been revised to include a summary of the transportation analysis (Volume 2, Section 6.3) and a direct link to the portion of the Technical Report (Section 6) that addresses transportation. Since the time is not ripe to make decisions on details or routes or potential alternative routes, software such as EPA's EJScreen was not used to develop alternative routes and evaluate the differences in environmental justice that might occur with alternative routes. Analysis tools such as these might be used for future routing decisions.

The Federal Emergency Management Agency, an organization within U.S. Department of Homeland Security (DHS), coordinates Federal and state

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

- Characterize the degree and duration of impacts to contaminated environmental media or biota based on the efficacy of current containment and remediation options, including the need for specialized equipment and emergency response training, and disclose the potential health risks to emergency responders and any exposure to the public.

056-27 (cont'd)

Environmental Justice

- Include an environmental justice section that addresses potential adverse and disproportionate environmental effects and risks of the proposed project on communities with environmental justice concerns, including transportation and storage of radioactive wastes.
- Describe methodologies for identifying impacts to all communities, and to those with environmental justice concerns, along the entirety of potential shipment routes and at the ultimate disposal destination. Consider the use of the EJScreen environmental justice screening and mapping tool to define impact communities.
- Provide early and frequent outreach and engagement opportunities, as described in detail above under "Meaningful Public Engagement".
- Outline measures to mitigate for impacts.

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participation in developing emergency response plans and is responsible for the development and maintenance of the Nuclear/Radiological Incident Annex (DHS, 2023) to the National Response Framework (DHS, 2019). The Nuclear/Radiological Incident Annex to the National Response Framework describes the policies, situations, concepts of operations, and responsibilities of the Federal departments and agencies governing the immediate response and shortterm recovery activities for incidents involving release of radioactive materials.

In the event of a release of radiological cargo from a shipment along a route, trained and equipped local emergency response personnel would be expected to arrive first at the accident scene. It is expected that response actions would be taken in the context of the Nuclear/Radiological Incident Annex protocols. Based on their initial assessment at the scene, they may involve state and Federal resources, as necessary. First responders or state and Federal responders would be expected to initiate actions in accordance with the DOT Emergency Response Guidebook (USDOT, 2024) to isolate the incident and perform any actions necessary to protect human health and the environment. (Responses could include evacuations or other steps to reduce or prevent impacts on the public.) Cleanup actions are the responsibility of the carrier.

056-28 The EIS does address potential adverse and disproportionate environmental effects and risks to communities with environmental justice concerns. Environmental justice is discussed in multiple sections of Chapter 3, *Impacts* (see Sections 3.1.11 and 3.3.8), and new sections were added to Volume 2 (Sections A.1.3.11 and A.3.3.7). For environmental justice, edits were made to the Final EIS based on EPA's letter stating that they prefer to not use the 50% methodology and terms and definitions were updated based on the 2023 EO 14096, *Revitalizing our Nation's Commitment to Environmental Justice for All*. However, decisions regarding the specific location of facilities are not being made in this EIS. The locations wher companies choose to site their facilities may be subject to further environmental analysis under the relevant regulatory authority (e.g., NRC). While existing LEU fuel cycle facilities NEPA analysis was used to inform the analysis of impacts in this EIS, there is no limitation on where facilities may be located within the United States. Use of the facility information does not indicate a preference for those sites for future HALEU-related activities. With no specific sites identified, analyses were high level and not site-specific, which also meant outreach to affected communities was limited. Despite not knowing specific locations of facilities, DOE made various efforts to communicate with communities with environmental justice concerns to inform them about the project and methods to participate in the EIS process. See the response to Comment 056-3, which details DOE's outreach.

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

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056-27 (cont'd)

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With no specific sites identified, environmental justice analysis varied according to the type of activity (e.g., mining and milling, enrichment, etc.) and the available information from existing NEPA documents.

1. For deconversion and storage, when existing site locations were not known, past NEPA documents were referenced for potential locations and impact conclusions. Those conclusions were summarized and no changes were made to the methodology or conclusions since they were published documents.
2. Regarding conversion activities, the analysis updated the demographic data using current U.S. Census data for block groups and counties. The analysis was conducted to determine the potential for environmental justice communities in the vicinity of proposed activities. The methodology was updated to use terms and definitions contained in the 2021 EO 14008, *Tackling the Climate Crisis at Home and Abroad*, and the 2023 EO 14096, *Revitalizing our Nation's Commitment to Environmental Justice for All*. For example, under the conversion activity, there is only one facility in the United States that performs commercial-scale uranium conversion. Additional block group analysis was conducted for that facility located in Metropolis, Illinois. SMEs determined the presence or absence of potential communities with environmental justice concerns and used existing NEPA impact analysis to summarize the effect conclusions. Using existing NEPA impact analysis represented the best available information for proposed impacts associated with these activities.
3. SMEs had sufficient information to perform a complete environmental justice analysis for enrichment activities. The analysis was performed by comparing current block groups at each of three known enrichment sites (i.e., Urenco USA, Piketon, and the GLE Site) to the county demographics to determine the existence or absence of environmental justice populations. Impact conclusions were updated. See also response to Comment 056-13.
4. A different approach was used to determine environmental justice communities in the vicinity of mining and milling activities or new proposed facilities. The number of existing and historic mines that would need to be analyzed was not reasonable considering overall costs and timeframe of obtaining data and conducting the analysis at the block group level. Instead, the analysis focused on mining sites that were located predominantly in certain regions within the United States (i.e., Nebraska, Texas, New Mexico, Wyoming, Arizona, Colorado, Utah, and South Dakota) and narrowed further to certain counties and cities within those states. Therefore, SMEs performed an analysis based on current U.S. Census Bureau and DOE disadvantaged communities data at the city, county, and/or state level to determine the presence or absence of communities with environmental justice concerns. This analysis was done based on comparing

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

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056-27 (cont'd)

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056-28

cities or counties to the state to make conclusions on the presence or absence of environmental justice communities. Determination of impacts for these communities, however, was based on the findings of previous NEPA documents. A similar approach was used to determine environmental justice communities at a fuel fabrication facility. Fuel fabrication activities are required to occur at an NRC Category II or Category I facility. This activity could also occur at a Category III facility, with proper modifications. Due to the number of potential facilities, SMEs again used a city, county, and/or state analysis to determine the presence of environmental justice communities. This analysis was done for Rockville, Maryland; Oak Ridge, Tennessee (locations of NRC Category II facilities); Erwin, Tennessee; Lynchburg, Virginia (locations of NRC Category I facilities); Richland, Washington; Wilmington, North Carolina; and Columbia, South Carolina (locations of NRC Category III facilities). This analysis was used to determine the presence or absence of communities with environmental justice concerns. Determination of impacts for these communities, however, was based on the findings of previous NEPA documents. Per EPA's recommendation, Volume 2 has been updated to communicate that this analysis may mischaracterize the presence of environmental justice communities. The EIS was also updated to note that further environmental justice analysis may be performed at a block group level if site-specific analysis is undertaken.

5. Environmental justice analysis for transportation activities between facilities was not conducted as a part of this program. With no specific sites identified, potential transportation routes are speculative. Although representative routes in this EIS do not have environmental justice analysis, all routes considered in the HALEU EIS follow the USDOT transport routing regulations. The routes were selected to be reasonable and consistent with routing regulations and general practice, but they are representative routes only because the actual routes would be chosen in the future.

In this EIS, instead of using EJScreen, DOE used a similar tool it developed to comply with EO 14008, *Tackling the Climate Crisis at Home and Abroad*, and DOE's adoption of the Justice40 Initiative. As a part of this initiative, DOE conducted an analysis to identify disadvantaged communities in the United States, which DOE defines as underserved, overburdened, and front-line communities (DOE, 2022). DOE's analysis considered a census tract that ranks in or above the 80th percentile of the cumulative sum of 36 burden indicators for a state and has at least 30% of the households identified as low-income populations (DOE, 2022) as a disadvantaged community. DOE considered disadvantaged communities to include low income, high unemployment and underemployment, racial and ethnic residential segregation, linguistic isolation, high housing cost burdens, distressed

Commenter No. 56 (cont'd): Christopher Yesmant, U.S. Environmental Protection Agency

Enclosure: Detailed Comments on the Draft EIS for Activities in Support of Commercial Production of HALEU

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056-27 (cont'd)

Environmental Justice

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056-28

neighborhoods, high transportation cost burden and/or low transportation access, disproportionate environmental stressor burden and high cumulative impacts, limited water and sanitation access and affordability, disproportionate impacts from climate change, high energy cost burden and low energy access, jobs lost through the energy transition, and access to healthcare. This tool identified cumulative burdens for environmental justice communities using locations (i.e., city, county, and/or states). This analysis was then used to generate locations that DOE categorized as disadvantaged communities pursuant to EO 14008, *Tackling the Climate Crisis at Home and Abroad*. As previously recommended, DOE included language regarding potential mischaracterization associated with not using block groups.

While EJScreen and DOE's approach both provide a comparable analysis, DOE's mapping tool was best suited for the national scope of this program. Once a site or facility has been selected, specific impacts may be assessed in future NEPA review by the relevant regulatory authority (e.g., NRC).

Commenter No. 57: Joe Loos

From: Joe Loos
To: HALEU-EIS
Subject: [EXTERNAL] My comments on the proposed EIS
Date: Monday, April 22, 2024 4:17:15 PM

To Whom It May Concern,
I am a senior citizen living in Western Montana who depends on NorthWestern Energy to meet most of my family's energy needs. These are my comments on the proposed EIS.

- DOE must disclose the total amount of taxpayer money they plan to spend on this project so the public is aware of the true cost of subsidizing the nuclear fuel cycle. ***057-1***
- I believe companies building new nuclear power plants should bear the risks and costs just like any other industry. The federal government shouldn't subsidize this industry with more taxpayer dollars.
- DOE should consider the full opportunity cost of spending taxpayer dollars on HALEU as opposed to other projects DOE could be supporting, such as renewable energy research & development - projects that would be able to be deployed in a short time frame to be an effective solution to climate change. In contrast, new nuclear power plants take years - or decades - to design and build, and they won't come online fast enough to address climate change or other environmental issues related to energy production. ***057-2***
- DOE must consider the full life cycle impacts of its proposal, including the negative impacts of additional uranium mining and milling, transportation of fuels, and waste disposal. ***057-3***
- This is especially critical: DOE must acknowledge that there is no permanent disposal facility for nuclear waste in the U.S. and until such a facility exists new nuclear power plants are unwise. We shouldn't be creating new nuclear waste when we have no place to safely and permanently store the waste that already exists. ***057-4***

Thank you for considering my views.
Joe Loos
[redacted]

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Joe Loos
[redacted]

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057-1 DOE acknowledges your concern regarding the cost of the HALEU program. DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

057-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of the CRD for additional information about purpose and need. Renewable energy technologies would not meet the purpose and need and are outside the scope of this EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information related to costs.

057-3 Thank you for your comment. The EIS does analyze all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6 of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

057-4 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall

Commenter No. 57 (cont'd): Joe Loos

impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 58: Joy LaClaire

From: Joy LaClaire
To: HALEU-EIS
Subject: [EXTERNAL] No to nuclear subsidies
Date: Monday, April 22, 2024 4:09:01 PM

For almost 50 years I have worked to prevent the increase in nuclear projects, whether for military or civilian purposes. *058-1*

To summarize, there are NO acceptably safe ways to dispose of waste materials. They constitute danger to the biosphere for millennial. *058-2*

There are far faster, safer and less expensive ways to increase electricity production. Subsidize them, not nuclear. *058-3*

Respectfully,

Joy LaClaire
[redacted]

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This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.
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058-1 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

058-2 The uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no mining/milling wastes with unique characteristics. All mining/milling wastes have a path to disposal. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See Section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

058-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of the CRD for additional information about purpose and need. Renewable energy technologies would not meet the purpose and need and are outside the scope of this EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information related to costs.

Commenter No. 59: Katie Sweeney, National Mining Association

From: Sweeney, Katie
To: HALEU-EIS
Subject: [EXTERNAL] National Mining Association Comments
Date: Monday, April 22, 2024 4:07:18 PM
Attachments: image001.png
Final HALEU EIS Comments 4-22-24.pdf

Attached please find the National Mining Association's (NMA) comments on the U.S. Department of Energy's draft environmental impact statement (EIS) analyzing the impacts of the department's proposed action to acquire high-assay low-enriched uranium (HALEU). Feel free to contact me with any questions.

Katie Sweeney

Katie Sweeney
Executive Vice President and Chief Operating Officer
National Mining Association
101 Constitution Ave. NW, Suite 500 East
Washington, D.C. 20001
Phone: (202) 463-2600
Direct: (202) 463-2627
ksweeney@nma.org

Response side of this page intentionally left blank.

Commenter No. 59 (cont'd): Katie Sweeney, National Mining Association

KATIE SWEENEY
Executive Vice President & Chief Operating Officer

April 22, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy, Idaho Operations Office
1955 Freemont Avenue
MS 1235
Idaho Falls, ID 83415

Submitted electronically via email to ***HALEU-EIS@nuclear.energy.gov****.*

Re: Draft Environmental Impact Statement (EIS) to Analyze the Impacts of the Department of Energy's Proposed Action to Acquire High-Assay Low-Enriched Uranium (HALEU)

Dear Mr. Lovejoy:

The National Mining Association (NMA) appreciates the opportunity to submit comments regarding the U.S. Department of Energy's (DOE) draft environmental impact statement (EIS) analyzing the impacts of the department's proposed action to acquire high-assay low-enriched uranium (HALEU).[1] NMA's members include current conventional and/or in situ leach uranium recovery (ISR) licensees, as well as potential future conventional and/or ISR license applicants. Several of these companies have operated or intend to operate in Wyoming and the NMA strongly endorses the comments of the Wyoming Mining Association (WMA). Similarly, we endorse the comments of the Uranium Producers of America, a national trade association representing companies in the domestic uranium mining, conversion, and enrichment sectors within the "front end" of the nuclear fuel cycle.

[1] 89 Fed. Reg. 16546 (March 7, 2024).

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Commenter No. 59 (cont'd): Katie Sweeney, National Mining Association

The NMA is the official voice of U.S. mining. Our membership includes more than 280 companies and organizations involved in every aspect of mining, from producers and equipment manufacturers to service providers. We represent all facets of the domestic mining industry and the hundreds of thousands of American workers it employs before Congress, federal agencies, the courts, and the public. The NMA advocates for public policies that will help America fully and responsibly utilize its vast natural resources. Our members work to ensure America has secure and reliable supply chains, abundant and affordable energy, and the American-sourced materials necessary for U.S. manufacturing, national security, and economic security, all delivered under world-leading environmental, safety, and labor standards.

DOE's Implementation of the Energy Policy Act of 2020

The draft EIS is an important component of DOE's implementation of Section 2001(a)(2)(D)(v) of the Energy Act of 2020 (EPACT 2020),[2] which authorizes creation of the HALEU availability program (HAP). The NMA strongly supported the creation of the program to ensure the development of a domestic commercial source of HALEU to fuel advanced reactors. As previously articulated by DOE, the first step to create a commercial HALEU fuel cycle is uranium ore production. As NMA commented on the EIS notice of intent in July 2023, the state of the domestic uranium mining industry over the last 15 years has been dire. As reported by the Energy Information Administration (EIA), domestic uranium production in 2021 reached an all-time low with production of 21,000 pounds.[3] ***059-1***

As recently as 1987, U.S. production supplied 49 percent of our national uranium requirements. This precipitous decline in supplying our own domestic needs is not due to a lack of uranium resources. The U.S. is blessed with abundant uranium resources capable of supplying both our defense and commercial needs for decades.[4] Rather, the current state of the domestic uranium mining industry is primarily a product of foreign, state-mandated production thwarting domestic producers' ability to compete on a level playing field. As a result, we are increasingly reliant on imports from state-sponsored producers in Russia and Kazakhstan that do not operate within free market principles. China is an emerging threat as it moves aggressively to expand its global uranium holdings to become the next ***059-2***

[2] 42 U.S.C. 16281; Pub. L. 116-620.
[3] *See* EIA, Domestic Uranium Production Report – Annual at https://www.eia.gov/uranium/production/annual/umine.php.
[4] According to public reports, approximately 1.1 billion pounds of known U_3O_8 resources exist in the U.S.

059-1 DOE acknowledges your support for the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

059-2 DOE acknowledges your concern regarding the front end of the nuclear supply chain and reliance on foreign sources of uranium and support for DOE's Proposed Action. Section 1.0.3, "Where Do We Get Uranium for Reactor Fuel Now?" of the HALEU EIS, describes the current uranium supply chain. Section 1.0.4, "How Will We Get What We Need," describes options for obtaining uranium for HALEU. As described in Section 2.1.1, "Uranium Mining and Milling," to encourage the use of a domestic supply of uranium in support of the commercialization of the HALEU fuel cycle, DOE's Enrichment RFP identified domestic supplies of uranium as the preferred source, and North American supplies as the next preferred source, although other foreign sources (allied or partner nations) could be utilized. The Enrichment RFP also identified existing mining capacity as preferred. In addition, please refer to Section 2.2, "Purpose and Need," of this CRD and Section 1.1 of the EIS for further discussion of the purpose and need of DOE's Proposed Action.

major new supplier. DOE's implementation of EPACT 2020 can help invigorate the very important front end of the nuclear supply chain.

059-2 (cont'd)

The Draft EIS Is an Important Step to Revitalize the Domestic Nuclear Industry

The NMA fully supports the DOE's preferred alternative especially its identification of "domestically sourced uranium from existing capacity as the preferred option for acquiring uranium."[5] The NMA agrees that such a step can help secure supply chains necessary for the commercialization of the HALEU fuel cycle.

059-1 (cont'd)

The NMA appreciates DOE's recognition that mining and milling activities performed under DOE's proposed action "have a long history of being conducted safely" and that "extensive environmental analyses have been completed for facilities that perform uranium mining and milling."[6] As such, DOE appropriately relied on existing NEPA analyses prepared by the U.S. Nuclear Regulatory Commission (NRC) to evaluate potential impacts related to conventional and ISR uranium operations including NUREG-1910, the 2009 Generic Environmental Impact Statement for In Situ Uranium Milling Facilities (GEIS).[7] The analyses therein reflect NRC Staff's regulatory expertise on ISR facilities and over 30 years of industry experience and confirms the low-risk nature of ISR activities.

059-3

Conclusion

Congress tasked DOE with accelerating development of a sustainable commercial HALEU supply chain. This supply chain is contingent on uranium production. The NMA appreciates the acknowledgements in DOE's draft EIS that domestic uranium production is conducted under some of the world's most rigorous environmental, health and safety standards and that there is no better way to secure our vulnerable nuclear supply chains than relying on domestic resources. We advocate for prompt finalization of the EIS including the preferred alternative's reliance on domestic sources of uranium and the conclusion that existing NEPA analyses cover uranium mining impacts. The NMA appreciates the opportunity to provide these comments. If you have any questions, please contact me at ksweeney@nma.org or (202)463-2627.

059-1 (cont'd)

[5] Draft EIS Executive Summary at p. 12.
[6] *Id.* at p. 2.
[7] Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities, NUREG-1910. U.S. Nuclear Regulatory Commission Office of Federal and State Materials and Environmental Management Programs and the Wyoming Department of Environmental Quality Land Quality Division. Available at https://www.nrc.gov/reading-rm/doccollections/nuregs/staff/sr1910/index.html.

059-3 DOE acknowledges your support for the mining and milling analysis in the EIS. Thank you for your comment.

Commenter No. 59 (cont'd): Katie Sweeney, National Mining Association

Sincerely,

Katie Sweeney

Katie Sweeney

Response side of this page intentionally left blank.

Commenter No. 60: Sue Kronenberger

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] Against taxpayer subsidies for nuclear power
Date: Monday, April 22, 2024 3:47:24 PM

Dear persons who manage DOE,
I appreciate all efforts that you have thus far made to assure that energy projects do not cause greater pollution or increases in climate temperatures. I write to you today to urge you to not fund more taxpayer subsidies for nuclear power. Nuclear power creates great waste that really cannot adequately be contained in the long run. As a society hoping to provide a livable planet for seven generations and more – we do not need more taxpayer subsidies for nuclear power.
Respectfully,
Sue Kronenberger

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060-1

060-2

060-1 (cont'd)

060-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

060-2 The uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no mining/milling wastes with unique characteristics. All mining/milling wastes have a path to disposal. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See Section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 61: Rachel Rockafellow

From: D. & R. Rockafellow
To: HALEU-EIS
Subject: [EXTERNAL] No nuclear energy in Montana!
Date: Monday, April 22, 2024 3:29:43 PM

We do NOT want nuclear energy in Montana! We want clean energy options! Our state has been raped enough over the years! Give Montana citizens clean energy options!!
Rachel Rockafellow
[redacted]

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061-1, 2
061-3, 2 (cont'd)

061-1 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

061-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of the CRD for additional information about purpose and need. Renewable energy technologies would not meet the purpose and need and are outside the scope of this EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information related to costs.

061-3 DOE acknowledges your concerns about your community and past contamination. In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Mining and milling operations have, in particular, resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. However, previously contaminated sites are not in the scope of the Proposed Action and therefore are not evaluated in this EIS. For additional information see Section 2.4, "Legacy Issues," of this CRD. While DOE understands the historic impacts of the uranium industry past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. The uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no wastes with unique characteristics. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See Section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 62: David McCoy, Citizen Action New Mexico

From: dave mccoy
To: HALEU-EIS
Subject: [EXTERNAL] HALEU EIS is a Flawed Document
Date: Monday, April 22, 2024 3:27:49 PM

The HALEU Is a completely flawed document that fails to consider the higher risk associated with increased uranium fuel content, buildup of more radionuclides in relation to interim pool storage safety, long term disposal safety, transportation exposures, disposal costs and greater long term risks to human health and the environment. *062-1*

The use of HALEU fuel has no demonstrable scientific basis for being a solution to the climate crisis for production costs and the time to implement the technology and deal with additional safety and disposal and proliferation/terrorism issues. *062-2* *062-1, 3*

The failed mirage of Yucca Mountain as a repository can only lead to the issue of reality that after 70 years, DOE still has no deep geologic repository and does not even have a viable candidate let alone identification of any safe, legal interim storage sites.

Texas and New Mexico want no part of radioactive waste even from current rad toxicity and burnup rates. Citing EISs for Andrews TX and Holtec NM sites, the planned DOE disinformation of the HALEU EIS even ignores the Appellate Court decision rejecting interim storage licensing at those sites!! *062-1 (cont'd)*

It is unknown how long pool storage and concrete dry storage can safely function for the higher rad heat containment or, if intended for existing reactor use, whether they are currently adequate in present form at existing reactor sites.

Repackaging facilities, even for current waste burnup levels, do not exist for later safe transportation and storage. Do utilities plan to insure transport of HALEU waste? What will the higher burnup rate mean for the corrosion levels and operations, if intended, at the aged nuclear reactors now licensed for additional 40 years by NRC? Three Mile Island deja vu?

It's time for DOE to Cut Through the Bullshit that nuclear power offers a clean viable power source compared to cheaper more cost effective alternative technologies relating to climate change. *062-2 (cont'd)*

DOE should get off the nuclear band wagon and solve the problems at the back end of the fuel cycle. *062-4* *062-1 (cont'd)*

David B. McCoy, J.D.,
Executive Director
Citizen Action New Mexico

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062-1 SNF has a long history of being safely managed and that management is subject to extensive regulatory requirements. These requirements address packaging, transportation, and interim storage. The characteristics of the various potential HALEU fuel assembles and therefore the associated characteristics needed for analytical evaluations cannot be known at this time and not ripe for any NEPA evaluations. When a HALEU fuel assembly design is prepared, the cognizant regulatory authority will perform the NEPA evaluation as part of the licensing and permitting processes. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition

Commenter No. 62 (cont'd): David McCoy, Citizen Action New Mexico

to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

062-2 HALEU alone is not intended to be a viable solution to the climate emergency. HALEU as a fuel source in advanced reactors, however, is expected to provide technological efficiencies that optimize and surpass the current existing low-enriched uranium (LEU) fleet of nuclear reactors. In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of the CRD for additional information on the purpose and need. Renewable energy technologies do not meet the purpose and need. Please see the discussion in Section 2.4 of the EIS and Section 2.8, "Out of Scope," of this CRD for additional information.

062-3 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are

Commenter No. 62 (cont'd): David McCoy, Citizen Action New Mexico

identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

062-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 63: Clifford David, Conservation Economics

From: Clifford David
To: HALEU-EIS
Subject: [EXTERNAL] Please stop supporting nuclear energy
Date: Monday, April 22, 2024 3:12:56 PM

063-1

Clifford C. David, Jr. | President & CEO

CONSERVATION ECONOMICS
Economic Goals. Ecological Principles.
[redacted]

[redacted]

[redacted]
E cdavid@conservationeconomics.com
[redacted]
www.conservationeconomics.com

063-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 64: Berkley Lane, Uranium Producers of America

From: Berkley Lane
To: HALEU-EIS
Subject: [EXTERNAL] UPA response for Draft HALEU EIS
Date: Monday, April 22, 2024 2:53:24 PM
Attachments: UPA Response for DOE HALEU EIS 4.22.24.pdf

Hello,

On behalf of the Uranium Producers of America, we are respectfully submitting the attached document in response to the DOE's "Notice of Availability of the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)." Please let me know if you have any questions, thank you in advance for your time.

Sincerely,

Berkley Lane

Berkley Lane
[redacted]

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Commenter No. 64 (cont'd): Berkley Lane, Uranium Producers of America

URANIUM PRODUCERS OF AMERICA
113 CALLE PALOMITA, SANTA FE, NEW MEXICO 87505
TELEPHONE (505) 690-7709; WWW.THEUPA.ORG

April 22, 2024

Mr. James Lovejoy
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Ave, MS 1235
Idaho Falls, ID 83415

RE: Response to Draft DOE EIS for Commercial Production of HALEU

Dear Mr. Lovejoy,

The Uranium Producers of America (UPA) respectfully submits the following response to the Department of Energy's (DOE) Notice of Availability of the Draft Environmental Impact Statement (EIS) for Activities in Supporting Commercial Production of High-Assay Low-Enriched Uranium (HALEU).

UPA is the national trade association representing companies in the domestic uranium mining, conversion, and enrichment sectors within the "front end" of the nuclear fuel cycle. UPA's mission is to promote the viability of the nation's uranium industry while being good stewards of the environments in which we work and live. UPA members conduct uranium exploration, development, and mining operations in Arizona, Colorado, Nebraska, South Dakota, New Mexico, Texas, Utah, and Wyoming. The conversion facility is located in Illinois, and our member enrichment company is based in North Carolina and Kentucky.

UPA appreciates DOE's desire to seek feedback regarding the draft HALEU EIS and its proposed action, which will in turn inform the final EIS. UPA has previously submitted comments to the DOE regarding the HALEU Availability Program (HAP) EIS Notice of Intent. In these comments, UPA highlighted why there should not be any siting or environmental concerns regarding potential HAP participants that are not already addressed by strict federal and state regulations. Under the National Environmental Policy Act (NEPA), there is already a rigorous licensing process in place to address all environmental concerns. The mining of uranium in the United States is heavily regulated, and safety concerns for employees, surrounding communities, and the natural environment are closely monitored to ensure safe operations are maintained. ***064-1***

It is crucial to implement the proposed action alternative and to acquire HALEU through procurement from commercial services. UPA agrees with DOE that there is currently insufficient private incentive to invest in commercial HALEU production and in the necessary commercial deployment of advanced reactors, because the domestic HALEU fuel cycle does not currently exist. The U.S. has been reliant on Russia and other state-owned entities (SOEs) like Kazakhstan and Uzbekistan for far too long. UPA members stand ready to ramp up domestic uranium production projects, all of which have gone through the strict statutory NEPA protocols. ***064-2*** ***064-3***

064-1 Thank you for participating in the EIS process. Please see the discussion in Section 2.7, "NEPA Process," of this CRD for additional information.

064-2 DOE acknowledges your support for the Proposed Action and your opposition to the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

064-3 DOE acknowledges your concern regarding the front end of the nuclear supply chain and reliance on foreign sources of uranium and support for DOE's Proposed Action. Section 1.0.3, "Where Do We Get Uranium for Reactor Fuel Now?" of the HALEU EIS, describes the current uranium supply chain. Section 1.0.4, "How Will We Get What We Need," describes options for obtaining uranium for HALEU. As described in Section 2.1.1, Uranium Mining and Milling, to encourage the use of a domestic supply of uranium in support of the commercialization of the HALEU fuel cycle, DOE's Enrichment RFP identified domestic supplies of uranium as the preferred source, and North American supplies as the next preferred source, although other foreign sources (allied or partner nations) could be utilized. The Enrichment RFP also identified existing mining capacity as preferred. In addition, please refer to Section 2.2, "Purpose and Need," of this CRD and Section 1.1 of the EIS for further discussion of the purpose and need of DOE's Proposed Action.

Commenter No. 64 (cont'd): Berkley Lane, Uranium Producers of America

However, the commercial sector and potential Uranium Reserve suppliers are missing the market signals that come with a uranium import ban from foreign adversaries. ***064-3 (cont'd)***

It is critical that the DOE does not select the alternative no action taken choice or accept the status quo. Uranium powers 20 percent of American homes and we rely on foreign adversaries for nearly half of U.S. natural uranium requirements. The invasion of Ukraine has further increased the urgency for ending U.S. reliance on uranium imports from Russia and its allies. Additionally, the Russian State Atomic Energy Company (ROSATOM) – an extension of the Kremlin and Russian military – benefits from hundreds of millions of U.S. dollars in nuclear fuel purchases each year. ***064-2 (cont'd)*** ***064-3 (cont'd)***

Potential suppliers to the Uranium Reserve have already undergone a rigorous NEPA or state permitting review and process. The new operations required to meet future Uranium Reserve requirements, will possess NEPA or equivalent state permitting compliance. The Department should understand that these permitting exercises are arduous, time consuming and fully provide for community involvement. Baseline information is gathered over a one-to-two-year period at a prospective mine site and all conceivable environmental and socio-economic impacts receive a "hard" look by the regulatory authority to ensure that the public interest, the workers, and the environment are protected. ***064-1 (cont'd)***

Conclusion

UPA appreciates the opportunity to comment on DOE's Notice of Availability of the Draft EIS for Activities in Supporting Commercial Production of HALEU. It is UPA's belief that long-term contracting for the material to be obtained for HAP will provide significant incentives and assistance in getting domestic operators back online and operating in full capacity. However, DOE should rely on a categorical exclusion to ensure the timely and responsible development of the HALEU fuel cycle, especially considering the urgent geopolitical and climate circumstances facing the United States. Confidence that DOE is committed to reducing duplicative and onerous review processes will provide the necessary guidance to allow operators to invest in workers and equipment to re-establish the critical capabilities of the domestic industry. UPA looks forward to further dialogue with DOE on important issues such as this. If you have any questions or require additional information, please contact Jon Indall at jindall@cmtisantafe.com. ***064-4***

Sincerely,

Jon J. Indall
Senior Policy Advisor for UPA

064-4 Thank you for participating in the EIS process. Please see the discussion in Section 2.7, "NEPA Process," of this CRD for additional information.

Commenter No. 65: Nancy Ford

From: Nancy Ford
To: HALEU-EIS
Subject: [EXTERNAL] feedback
Date: Monday, April 22, 2024 2:43:14 PM

Dear Mr. Lovejoy,

Regarding the Draft Environmental Impact Statement for Activities in Support of Commercial HALEU Production, how will citizens access public feedback from all sessions held by the DOE, including the last session in Chandler, AZ, and all written comments presented to the DOE that are due today? Will the DOE be the organization to compile this information or another?

Thank you for your response.

Nancy

Nancy Ford
[redacted]

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065-1

065-1 All comments received on the Draft EIS have been compiled and responded to by DOE in this CRD (Volume 3) of the Final EIS. Recordings of public hearings and the two virtual Tribal Listening Sessions are available on the project website (https://www.energy.gov/ne/haleu-environmental-impact-statement). Project information shared at the final in-person Tribal Listening Session was repeated from previous virtual meetings, and comments given to DOE during that meeting are available and responded to in this CRD. However, the in-person meeting was not recorded.

Commenter No. 66: Michel Lee, Council on Intelligent Energy & Conservation Policy

From: GMAIL LEE2
To: HALEU-EIS
Subject: [EXTERNAL] HALEU DEIS - Public Comment on DOE/EIS-0559
Date: Monday, April 22, 2024 11:58:32 PM

April 22, 2024

Comments of CIECP and PHASE

Re: Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU), DOE/EIS-0559 (published March 2024).

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
E-mail: HALEU-EIS@nuclear.energy.gov

Dear Mr. Lovejoy:

We write to ask the Department of Energy (DOE) to **withdraw the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)**, DOE/EIS-0559, issued in March 2024 (DEIS). The reason is that the projects envisioned are not sufficiently ready for evaluation. ***066-1***

As the DOE itself acknowledges in the DEIS Summary:

"Many of the specifics associated with these activities are subject to factors beyond the scope of the Proposed Action. The fuel requirements for advanced reactors would be dependent not only upon which reactor designs are ultimately licensed and operated, but also to what extent the commercial operation of advanced reactors is successful. This in turn impacts both the type and number of fuel fabrication facilities needed and the ultimate disposal of HALEU fuel. Therefore, a detailed assessment of the impacts of these activities would be speculative and is not included in the EIS." (DEIS Summary p 11)

DOE further notes the level of uncertainty with respect to cumulative effects impacts analysis: ***066-2***

Because of the large number of activities and potential facilities evaluated in this HALEU EIS and the uncertainty of the numbers and locations of facilities, potential facilities evaluated in this HALEU EIS and the uncertainty of the numbers and locations of facilities, a cumulative effects analysis for most activities under the Proposed Action in this HALEU EIS would be speculative and not amenable to detailed analysis at this time. DOE expects that new or modified HALEU production facilities that would be licensed and subject to additional NEPA or equivalent state evaluation would include consideration of cumulative impacts by the NRC, an

066-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

066-2 Cumulative effects are typically evaluated by combining the effects of a proposed action with the effects of other past, present, and reasonably foreseeable actions in the ROI. These other actions include on-site and off-site projects conducted by Federal, state, and local governments, the private sector, or individuals, that are within the ROIs of a proposed action. Due to the large number of activities and potential facilities evaluated in this HALEU EIS and the uncertainty of the numbers and locations of facilities, a cumulative effects analysis for the majority of Proposed Action and related activities was not possible. However, NEPA documentation exists for many of the activities that would be associated with a HALEU fuel cycle, especially for the production of LEU (a necessary step in the enrichment process to produce HALEU). Most, but not all, of those NEPA documents (see Appendix B of Volume 2, *Facility NEPA Documentation*) contain cumulative effects analyses for the specific facilities and locations. Generally, these assessments mirrored the impacts associated with the activity being analyzed in the document. That is, resource areas with SMALL impacts from the proposed action, tended to have SMALL cumulative impacts. Similarly, so did resource areas with MODERATE or LARGE impacts. However, it was not possible to extrapolate that analysis to sites where no cumulative effects analysis has been performed. Please reference Chapter 4 of the Final EIS for additional information regarding cumulative impacts associated with the HALEU EIS. Existing NEPA evaluations were utilized in total to provide a representative range of potential environmental consequences using the best available information. Additionally, it was assumed that the siting of facilities, have been and would continue to be compliant with all Federal, state, and local regulatory, licensing, and permitting requirements which include the evaluation of the receptors and environments identified in the comment. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). New or modified HALEU production facilities that would be licensed and subject to additional NEPA or equivalent state evaluation by the NRC, an Agreement

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Agreement State, or other Federal agencies." (DEIS, p 2-36)

Determination of cumulative for radioactivity uniquely mandates looking at the cumulative effects not only when added to other past and present actions, but looking into the future – which for radioactive materials is centuries to millennia. The ecosystem parameters are vast, because the danger of released long-lived isotopes which can harm living things will persist for a mindboggling long time. Cumulative effects analysis necessarily involves a robust evaluation of the uncertainties, which DOE has failed to do. It has long been recognized that incremental harms not only add up, but have combined impacts which substantially exceed their added sums. As articulated by the Council on Environmental Quality decades ago: "Evidence is increasingly demonstrating that the most devastating environmental effects may result not from the direct effects of a particular action, but from the combination of individually minor effects of multiple actions over time." (White House CEQ: Considering Cumulative Effects Under the National Environmental Policy Act, Council on Environmental Quality Executive Office of the President, 1997. https://www.energy.gov/nepa/articles/considering-cumulative-effects-under-national-environmental-policy-act-ceq-1997, at p 1.) Further, DOE may not legitimately cast aside its obligation to at least identify potential cumulative effects by nebulously pointing to the issuance of "some" past reports, especially since past reports disregarded actions and conditions which have transpired since and related to a world which is rapidly becoming more fragile, as climate change and numerous other human-influenced conditions and natural phenomena unfold.

066-2 (cont'd)

Thus our key point is that there is not enough substance in the DEIS to truly inform the public about the program at the level of detail which is warranted for such a serious and costly program. This, in turn, deprives the public of adequate opportunity for comment.

We also urge the DOE to **support the No Action alternative**. The Proposed Action to initiate a program for the acquisition of HALEU would set the United States on an extraordinarily reckless course.

066-1 (cont'd)

Every step of a HALEU program presents unacceptable level of environmental and public health risk.

The front end of the uranium fuel cycle, especially the mining step, has a long track record of despoilation of land and contamination of water. The front end also has a shameful history of damage to Native American tribal lands and impairment of the health and welfare of Indigenous People. Continuing this pattern by embarking on work to create an even more dangerous and radioactive nuclear fuel cycle would perpetuate extreme environmental injustice.

066-3

Throughout the DEIS, DOE explicitly adopts the assumption that regulations will result in avoidance of undesired events. For example, DOE states that regulations "would likely result in avoidance of earthquake and land subsidence prone locations, and locations with substantial wetland or flood plains" and that construction and operations at "all sites" would be conducted in compliance with all NRC and all other

066-4

State, or other Federal agencies, would be expected to include consideration of cumulative effects. Please see also the response to Comment 056-7 for additional information.

066-3 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling and Section A.3.3.8 discussing enrichment legacy issues have been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD. Since decisions on specific location of facilities are not being made in this EIS, providing detailed studies (including site specific epidemiological studies) in the body of the EIS or appendices for the affected environment would not provide concise and informative information to the potential impact analysis approach. A limited discussion for affected environments is included or referenced in the Section 1.3.11 of the Technical Report (Leidos, 2023). After site locations are finalized, DOE expects that additional environmental analysis will also be conducted by the relevant regulatory authority.

066-4 The existing NEPA evaluations were utilized in total to provide a representative range of potential environmental consequences using the best available information. This included review and consideration of 37 different NEPA analyses. Changes in regulations or industry standard practices for reducing or eliminating potential for impact also factor into smaller scale impacts than those determined in previous (earlier) NEPA evaluation. This analysis is further documented in the Technical Report (Leidos, 2023). Changes were made throughout the Final EIS to improve introduction, discussion, and linking to the Appendix A and the Technical Report, which should help explain how DOE substantiated the impacts conclusions.

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governmental regulations. (DEIS, p 3-2)

Such assumptions bring to mind the philosophy of all is best in the best of all possible worlds satirized by Voltaire in *Candide* C. It would be nice for regulations to always embody perfect prescience, for politicians and agencies to be free from influence, for corporations to be unceasingly vigilant, for workers and vendors to unfailingly reliable and never subject to imperfection or corruption. In the real world, these attributes and conditions do not apply. Instead of assuming every day will be a lovely one, the DOE owes an obligation to the public to present a candid and robust analysis of what can go wrong under a range of plausible very serious to worst case scenarios. That endeavor should begin with a strong overview of the many regulatory failures, corrupt practices, near-miss accidents, and unintentional spills and releases of hazardous materials – including over just the years of the current century. DOE should also fully apprise the public of all the factors which the NRC excises from licensing regulations, as well as the extent to which the NRC issues exemptions. ***066-4 (cont'd)*** ***066-5***

The post-mining operations contemplated would put the nation at risk of sabotage and terrorist attack.

Creating a HALEU fuel supply chain will elevate proliferation risk both directly, via manufacture of just-at-the-point-of-weapons-use fuel, and indirectly by placing the US in the posture of hypocrisy if we protest advancement of a similar program in other nations.

DOE notes the finding made by the National Academies of Science (NAS) in a 2023 report that "'Expanding the global use of high-assay low-enriched uranium (HALEU) would potentially exacerbate proliferation and security risks because of the potentially greater attractiveness of this material for nuclear weapons compared with the low-enriched uranium used in light water reactors. The increased number of sites using and states producing this material could provide more opportunity for diversion by state or nonstate actors'." (DEIS, p 3-34)

However, with a casual nod to the risk, the DOE simply dismisses it without bothering to present an even cursory discussion of the evolving risks: "DOE acknowledges that the widescale deployment of HALEU fuels in U.S. reactors, which could be facilitated by the Proposed action, does present different proliferation concerns than the use of LEU, but believes that (1) adequate controls are in place to reduce the proliferation concerns to acceptable levels and that (2) the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks." (DEIS, p 3-34) ***066-6***

The lack of candor and discourse is an insult to the intelligence of the public. A multitude of rapidly evolving threats to nuclear and other critical infrastructure is well within the realm of information in the public sphere. Growing risks which we currently face include evolving dual use technologies (e.g., AI, cyber, drones) and serious geopolitical and sociopolitical conflicts, as well as the rapidly growing spread of disinformation and misinformation in all manner of media. Instead of presenting analysis, DOE issues bland unsupported assurance that safeguards will be in place and the merits of HALEU (not particularly well elaborated in the DEIS either) outweigh

066-5 The NRC's licensing and permitting processes of HALEU facilities are outside the scope of this EIS. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

066-6 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 66 (cont'd): Michel Lee, Council on Intelligent Energy & Conservation Policy

proliferation and terrorism. *066-6 (cont'd)*

Hundreds of billions of dollars have already been spent by American taxpayers in support of uranium fuel production and nuclear energy. Uniquely, the costs continue to rise and despite 70 years of subsidization, the industry cannot stand on its own two feet. There is no valid energy-related reason for embarking on what is, for all intents and purposes, a massive redistribution of money from the pockets of ordinary American taxpayers to private venture capitalists and multibillion dollar corporations for the purpose of gambling on speculative nuclear projects. *066-7*

From a safety point of view, it is also most telling that the nuclear industry remains unwilling to commit to continuation without the unparalleled liability protection provided by the Price-Anderson Act – which, of course, was implemented in 1957 as a 'temporary' support for an industry in its infancy. *066-8*

The cost and hazard of managing the nation's existing inventory of spent fuel and other high-level, as well as the so-called "low-level" nuclear waste is already untenable. Adding to it with a hotter, more radioactive waste stream of new complexity is utterly irresponsible. *066-9*

The climate crisis mandates solutions that will make a major difference within the current decade. Wide distribution of currently available renewable technologies backed by funding support for modernization of the grid, efficiency solutions, storage options, and development of battery backup systems are where dollars should be directed.

Renewable energy can be rapidly scaled up, but the signals to the marketplace need to be made strongly now. Nuclear is not only too slow and expensive, it is too inflexible to support a renewables-based grid. *066-10*

The IPCC ranks nuclear far behind renewable energy and lower energy consumption under the Sustainable Development Goals due to nuclear's high cost, problem of waste management, impact on water resources, pollution from uranium mines, difficulty of ensuring the full independence of regulatory authorities, and proliferation risks.

The question of America's energy future should be addressed in the framework of a public debate informed by proper agency reports and full transparency. The HALEU DEIS does not serve this objective.

Michel Lee, Esq.

On behalf of
Council on Intelligent Energy & Conservation Policy (CIECP)
and
Promoting Health and Sustainable Energy (PHASE)

066-7 DOE acknowledges your concern regarding the cost of the HALEU program. Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Related to energy-related reasons, nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to. Help with elimination fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from the implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section2.7.2 of the HALEU EIS.) The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050, this section of the EIS also cites an *Organization for Economic Cooperation and Development – International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

To meet Congressional directives, DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information about funding.

066-8 The commenter's concern about the nuclear industry being unwilling to proceed without protection of the Price-Anderson Act is out of scope for this HALEU EIS. The HALEU EIS addresses the impacts of implementing the proposed action. These impacts are summarized in Tables A-1 through A-10 of Volume 2, Appendix A, of the HALEU EIS. DOE also expects that safety concerns would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the Proposed Action.

066-9 DOE acknowledges your opposition to the Proposed Action, but notes that in the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January

Commenter No. 66 (cont'd): Michel Lee, Council on Intelligent Energy & Conservation Policy

1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

The uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no wastes with unique characteristics. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition," in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. SNF has a long history of being safely managed and that management is subject to extensive regulatory requirements. These requirements address packaging, transportation, and interim storage. The characteristics of the various potential HALEU fuel assembles and therefore, the associated characteristics needed for analytical evaluations cannot be known at this time and not ripe for any NEPA evaluations. When a HALEU fuel assembly design is prepared, the cognizant regulatory authority will perform the NEPA evaluation as part of the licensing and permitting processes. Also, please refer to Section 2.1, "Support and Opposition," and 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a further discussion of these topics and DOE's responses.

066-10 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed

Commenter No. 66 (cont'd): Michel Lee, Council on Intelligent Energy & Conservation Policy

Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Even with the timeline the commenter identified, nuclear could contribute to the reduction in carbon emissions by then.

The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information. The commenter's statement that nuclear is too inflexible to support a renewables based grid fails to take into consideration that nuclear power acting as a baseload power supply is a compliment to renewables that produce power at varying rates. But, nuclear power reactors also have the capability to operate in a load following manner. (In fact in some countries nuclear power is currently used in that capacity.) Therefore, nuclear power can act to respond to variations in both generation and consumption on an electical grid. Advanced nuclear reactors come in many sizes and are intended to operate as part of power plant site that could host one or more individual plants. The range of power output from these reactor sites makes them desirable for anywhere from providing a small source of electricity (say in remote locations without total reliance on a grid to import power) to a large generating capacity. Nuclear also can provide power other than to an electrical grid; uses include production of process heat, hydrogen production and coproduct generation. Additionally, the IPPC report the commenter sites evaluates pathways for future energy production and in all of these pathways energy production from nuclear power increases over worldwide 2010 production, in one pathway doubling by 2050. The study also states that risk assessments show health risks are low and that societal concerns influencing the political process are the factors affecting limitations on increased nuclear electrical production capacity. The IPCC report supports the position that nuclear power is an important tool for combating climate change (ORONO, 2024) (All about the IPCC report on climate change webpage, accessed June 3, 2024 web page: https://www.orano.group/en/unpacking-nuclear/all-about-the-ipcc-report-on-climate-change.)

Commenter No. 67: Lydia Garvey

From: Lydia Garvey
To: HALEU-EIS
Subject: [EXTERNAL] Nix Nuke power plants, Nix tax subsidies!
Date: Monday, April 22, 2024 11:36:45 PM

- DOE must disclose the total amount of taxpayer money they plan to spend on this project so the public is aware of the true cost of subsidizing the nuclear fuel cycle. *067-1*
- DOE should be conservative in its spending and its estimate of need for HALEU. The DOE's analysis is based on speculative nuclear power plant projects that will likely never get built.
- Companies building new nuclear power plants should bear the risks and costs just like any other industry. The federal government shouldn't subsidize this industry with more taxpayer dollars.
- The DOE should consider the full opportunity cost of spending taxpayer dollars on HALEU as opposed to other projects DOE could be supporting, such as renewable energy research & development - projects that would be able to be deployed in a short time frame to be an effective solution to climate change. In contrast, new nuclear power plants take years - or decades - to design and build, and they won't come online fast enough to address climate change or other environmental issues related to energy production. *067-2*
- DOE must consider the full life cycle impacts of its proposal, including the negative impacts of additional uranium mining and milling, transportation of fuels, and waste disposal. *067-3*
- DOE must acknowledge that there is no permanent disposal facility for nuclear waste in the U.S. and until such a facility exists new nuclear power plants are unwise. We shouldn't be creating new nuclear waste when we have no place to safely and permanently store the waste that already exists. *067-4*
- Strongly urge you to stop the insanity! *067-5*
- Your assistance in this most urgent matter would be much appreciated by all present & future generations of all species!
- Thank you
- Lydia Garvey Public Health Nurse
- [redacted]

****
This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.
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067-1 DOE acknowledges your concern regarding the cost of the HALEU program. DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information about funding.

067-2 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Even with the timeline the commenter identified, nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

Commenter No. 67 (cont'd): Lydia Garvey

067-3 Thank you for your comment. The EIS does analyze all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6 of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

067-4 DOE acknowledges that there is currently no permanent waste repository. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, HALEU Spent Nuclear Fuel Storage and Disposition, HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the

Commenter No. 67 (cont'd): Lydia Garvey

HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

067-5 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 68: Diane D'Arrigo, Nuclear Information and Resource Service

From: D'Arrigo, Diane <Alert>
To: HALEU-EIS
Subject: [EXTERNAL] NIRS, SEED, Beyond Nuclear, CFNFGL, DWM, comments on HALEU DOE/EIS–0559
Date: Monday, April 22, 2024 11:27:31 PM
Attachments: HALEU NIRS Comments on DEIS 4-22-2024.pdf

Diane D'Arrigo
Nuclear Information and Resource Service
[redacted]

Response side of this page intentionally left blank.

Commenter No. 68 (cont'd): Diane D'Arrigo, Nuclear Information and Resource Service

Nuclear Information and Resource Service * Beyond Nuclear Coalition For a Nuclear Free Great Lakes * Don't Waste Michigan Sustainable Energy and Economic Development Coalition

Mr. James Lovejoy
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April 22, 2024

Comments on DOE/EIS–0559 *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium* (Draft HALEU EIS)

Our organizations (and others) requested additional time to prepare comments but since that request has been denied, we provide our major points here with the intent to convey major concerns and opposition to the HALEU program, and to highlight DOE's negligence in failing to assess and remediate the devastating consequences to people and the environment of uranium production that has been going on in North America, Turtle Island, for well over a century. To assess projected future environmental impacts, DOE must acknowledge the effects of the nuclear fuel "cycle" (chain) which have occurred and continue to cause pain, suffering, long-lasting contamination, economic loss and death. Ignoring and minimizing the existing realities makes a sham of future predictions. For most of the thousands of uranium mines in the US, cleanup is not even in the planning stages. Even the monumental Church Rock Uranium disaster in 1979 has not been cleaned up. DOE and the US government have not cleaned up or compensated people in the area Riley Pass in northwest South Dakota and southwest North Dakota, the Hunkpapa community and the Grand River where uranium was intentionally BURNED. ***068-1*** ***068-2***

1. The DEIS fails to mention the various water management authorities, either federal, state, county and tribal, existing in each of the potentially impacted regions, thereby setting up the stage for further social unrest, political dissension and economic inequality and will encourage increased racism against Native Americans. ***068-3***

068-1 DOE acknowledges your opposition to the Proposed Action. However, in the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information. Irradiated (spent) HALEU fuel would not be significantly more radioactive than "normal" commercial LEU fuel and could be managed in the same facilities. Uranium-235 is the fissile material in HALEU. There is no plutonium in unirradiated HALEU and irradiated HALEU would not contain a significant quantity of fissile plutonium. (see https://fuelcycleoptions.inl.gov/SiteAssets/SitePages/Home/182926.pdf) DOE is not aware of any authoritative studies that connect a HALEU or LEU fuel cycle with accelerated climate change. In contrast, there are numerous studies showing the benefits of nuclear energy on reducing greenhouse gas emissions and their impacts on climate change (see https://world-nuclear.org/nuclear-essentials/how-can-nuclear-combat-climate-change#:~:text=Nuclear%20power%20plants%20produce%20no,electricity%20when%20compared%20with%20solar and https://www.iaea.org/bulletin/what-is-the-clean-energy-transition-and-how-does-nuclear-power-fit-in. Please see Section 2.8, "Out of Scope," of the CRD for additional information about expected greenhouse gas emission decreases related to the Proposed Action.

068-2 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. Further, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur.

Commenter No. 68 (cont'd): Diane D'Arrigo, Nuclear Information and Resource Service

2. The DEIS fails to mention the current historic controversy involving the theft of land from Native American tribes through the usurpation and dispossession by violating the 1868 Fort Laramie Treaty ("Treaty with the Sioux — Brulé, Oglala, Miniconjou, Yanktonai, Hunkpapa, Blackfeet, Cuthead, Two Kettle, Sans Arcs, and Santee — and Arapaho, 1868")(Treaty of Fort Laramie, 1868). 15 Stats. 635, Apr. 29, 1868. Ratified Feb. 16, 1868; proclaimed Feb. 24, 1868.). The Native Americans have always held to the tenet: THE BLACK HILLS ARE NOT FOR SALE. ***068-4***

3. The DEIS fails to show the hydrologic boundaries, river basins and groundwater flow. DOE cannot claim future impacts will be insignificant or small without identifying and reviewing past and current ones. ***068-3 (cont'd)***

4. The DEIS doesn't provide any measures of security or safety in terms of terrorism, hazardous materials releases, water pollution, proliferation of bomb-grade or nearly bomb-grade fuel. ***068-5***

5. The DEIS fails to honestly assess the risks to groundwater resources as well as groundwater flow nor does it consider groundwater recharge. ***068-3 (cont'd)***

6. The DOE fails to reveal the dangers to surface water, wells and drinking water.

7. The DEIS assumes uranium companies will act honorably even though they have abandoned radioactive waste from previous permits and licenses and violated regulations and license conditions. ***068-6***

8. The DEIS fails to acknowledge impacts and effects of future mining, milling, ISL, conversion, enrichment, deconversion, fuel fabrication and use in reactors will have on surrounding communities in terms of health, property values, taxes and reclamation costs nor does the DEIS offer credible economic analysis of uranium mining or in situ leach uranium mining (ISL).

9. The DEIS is inherently prejudiced against Native Americans by not admitting past contamination and failing to consider water, cultural and historic properties primarily on Native Americans. ***068-2 (cont'd)***

As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include assessments of the existing affected environments, including health impacts from prior operations at specific locations. For additional information see Section 2.4, "Legacy Issues," of this CRD.

068-3 Thank you for your comment. Decisions regarding specific location of facilities associated with the Proposed Action are not being made in this EIS. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental requirements which would likely include analysis and identification of site-specific water resources (including local hydrologic boundaries, river basins, and groundwater flow) and relevant federal, state, county, and tribal regulations/ requirements. Revisions have been made to Chapter 6, Permits and Consultations, to more thoroughly list Federal regulations for which compliance would be required nationwide. The assessment of the severity of potential water resources impacts under the Proposed Action (which range from small to large, depending on the analyzed activity) was based on existing National Environmental Policy Act (NEPA) documentation for existing facilities. Section 3.1.4 of the Final EIS has been revised to include additional detail related to water resources impacts associated with mining and milling (see also the Technical Report [Leidos, 2023] as referenced in the final EIS for an expanded discussion for potential impacts associated with this activity and others).

068-4 Locations of future HALEU facilities and activities will not be chosen as a part of the Record of Decision for this EIS as potential HALEU fuel cycle facilities are subject to an ongoing procurement process. Without project locations, DOE could not identify whether Tribal nations would be affected HALEU facilities and activities, and if so, which Tribes would be affected. When locations are determined DOE expects the NRC or the applicable regulatory authority would provide formal consultation opportunities with the affected Tribes during the subsequent NEPA or equivalent environmental review process. During these consultations, treaty rights could be discussed, if applicable.

068-5 Congress directed DOE, in the Energy Act of 2020, to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by

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10. The DEIS fails to consider future issues involving treaty rights and access to sacred ceremonial grounds. The DEIS fails to consider state and local government liabilities. ***068-4 (cont'd)***

11. DOE's projections of the demand for HA-LEU are entirely unrealistic. The amount of capacity from HA-LEU-dependent reactor designs that DOE's EIS is based on are completely unsubstantiated--there is zero evidence that they will happen, risking massive amounts of federal funds that could legitimately be used to fight climate change. ***068-7***

12. The companies promoting reactor designs that would run on HA-LEU extremely far from being able to fulfill orders, and they are entering the business at their own risk. DOE is wasting taxpayer money setting up a whole fuel chain to supply reactors that are not even fully designed technically nor certified or licensed by the Nuclear Regulatory Commission. ***068-8***

13. The projected new nuclear industry (if ever shown to be technically complete and licensable) would require a fuel that isn't commercially available at the scale necessary to support wide deployment of their reactor designs. The number of potential projects in the pipeline is small and none of the companies have demonstrated their commercial or technical viability. ***068-7 (cont'd)***

14. If HA-LEU enrichment and production capacity can be scaled to industry demand, then it does not require the DOE to sponsor it. The billions of dollars of taxpayer investment that would be at risk is completely unjustified. ***068-8***

→ "Build it and they will come" is not a viable business strategy, or else the industry would be financing HA-LEU infrastructure itself.

→The risk to taxpayers is too great for DOE to assume that risk on behalf of taxpayers, and it does not justify the environmental damage, risks to public health, safety and environmental justice, and nuclear weapons non-proliferation risks that HA-LEU production inevitably entails. ***068-9***

15.The DOE is woefully negligent in managing the existing, massive stockpiles of depleted uranium, the essential byproduct of all uranium enrichment. Existing DU stockpiles are in an increasingly dangerous state of degradation awaiting deconversion to more chemically stable forms. HA-LEU will produce DU at even greater volumes and concentrations per unit of enriched fuel. ***068-10***

January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE will continue working with industry, the NRC, and the IAEA to further assess potential risks associated with a commercial HALEU fuel cycle, and NNSA will continue to strengthen its cooperation with industry to enhance the security and safeguards of new HALEU-based reactor designs. At the same time, DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

068-6 The EIS did use the latest NEPA impact data for all potential sites, and surrogates for others, to allow Subject Matter Experts (SMEs) to predict the potential impacts from the use of the resource for production of HALEU. Impacts were addressed for all aspects of the HALEU fuel cycle: mining and milling, conversion, enrichment, deconversion, HALEU storage, and transportation between facilities. This information is included in Sections 3.1 through 3.6 and summarized in Section 2.6.1 of the HALEU EIS. Impacts from post Proposed Action activities (fuel fabrication, use of HALEU in advanced reactors, and fuel management are also discussed to the extent practical in Section 3.1.7. Also see Appendix A and the referenced Technical Report (Leidos, 2023). The Final EIS has been updated to clearly indicate how the SMEs evaluated the existing NEPA documents, and also includes updates to the potential impacts discussions. Since the potential impacts could occur from a range of facilities (including existing, brownfield, and greenfield sites), the impacts were evaluated by SMEs and presented in the ranges used by the primary regulatory authority, the Nuclear Regulatory Commission (NRC). As explained in the EIS, given the large number of potential activities and locations, and the direction in 40 C.F.R. 1502.1 to focus on "significant environmental impacts," the potential

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→ At conventional enrichment rates, each kg of LEU yields 7-8 kg of DU. That ratio will be significantly greater for HA-LEU. *068-10 (cont'd)*

16. The US has been risking war with Iran over the uses of centrifuge enrichment technology to produce HA-LEU for over a decade. The non-proliferation regime may not be able to withstand the hypocrisy of the US building a commercial HA-LEU industry. *068-5 (cont'd)*

17. HA-LEU irradiated fuel will be even more radioactive and complicated to store than LEU irradiated fuel, further complicating the process of long-term management and repository siting and design. If it is ever used in commercial power reactors the high and so-called "low-level" radioactive waste will be much more concentrated, thus longer lasting and dangerous.

18. Does DOE plan to sign the standard contract to take the irradiated/" spent" fuel from every SMR and new reactor? We still have no permanent isolation for the 90000 metric tonnes of irradiated fuel generated by the commercial nuclear industry. *068-10 (cont'd)*

Every community with that waste has become a de facto nuclear waste storage community. Proliferating HALEU-powered new reactors will create more nuclear waste sites with no capacity to isolate it for as it remains dangerous.

19. Now that the Price-Anderson Act has been renewed, taxpayers could shoulder the liability for statistically inevitable damages. Or the liability will be borne by those exposed and whose property is destroyed. *068-11*

20. The Congressional legislation directing DOE to pursue HALEU does not mandate wasting money building capacity that isn't needed. Congress authorized funding for DOE to ensure HA-LEU is available, but a big part of that is based on DOE evaluating how much HA-LEU will actually be needed. It's DOE's job to be realistic about that, not just to accept whatever industry boosters claim. Just because a few startup companies that have never built a reactor before, with no other sources of revenue or financing--thus totally dependent on government subsidies--want to undertake unnecessary, uneconomic and unproven technologies, DOE does not have to comply. DOE is supposed to be the responsible adult in the room protecting the citizenry. *068-7 (cont'd)*

21. DOE is dodging site-specific analysis and unjustifiably claiming no or small environmental impacts without adequate basis. Some components of HA-LEU production are not known but some of the locations are obvious and evident. *068-6 (cont'd)*

Enrichment:

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impacts analysis in Volume 1 of the EIS concentrates on those impacts expected to be MODERATE or LARGE. SMALL impacts are highlighted in the impact summary tables accompanying each activity in Volume 1; however, the bases for and further discussion of small impacts are primarily located in the Technical Report (Leidos, 2023). The Final EIS has been updated to include specific links to the appropriate sections of the Technical Report (Leidos, 2023) so as to provide more detailed analyses of the basis for the conclusions, especially those conclusions where the impacts were judged by the SMEs and supporting NEPA analyses to be "small."

As stated in Section 1.6 of the HALEU EIS, "This EIS provides information to support a decision regarding whether to: (1) Facilitate the establishment of commercial HALEU fuel production capability and (2) Acquire (through HALEU as enriched uranium hexafluoride and deconversion services) from commercial sources, up to 290 metric tons (MT) of HALEU enriched to at least 19.75 and less than 20 weight percent U235 over a 10-year period of performance." This EIS is not selecting locations or processes/technologies that may be employed by the commercial suppliers. As such, the existing NEPA evaluations were utilized in total to provide a representative range of potential environmental consequences using the best available information. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). Additionally, existing sites likely have legacy characteristics that are not reflective of future construction and/or operational related potential environmental consequences. In response to comments about legacy impacts, DOE has added a new Section A.1.3.12, Legacy Health Issues, to Volume 2, and Section 2.4, "Legacy Issues," to the Comment Response Document (CRD) to provide additional information.

An economic analysis of mining and in-situ recovery is not within the scope of an EIS

068-7 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Section 1.1 of the EIS in which DOE has clarified the purpose and need, including the basis for the projections of HALEU needed. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic

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- Piketon/Portsmouth--Centrus is running a pilot plant.
- LES/URENCO in New Mexico, the existing commercial enrichment plant that could add HA-LEU capacity.
- In Tennessee HEU has been downblended to make LEU

UF6 Conversion

- Honeywell UF6 conversion plant in Illinois (the only conversion plant in the US)

Fuel Production (deconversion of UF6 and conversion to useful fuel forms, e.g., UO2, elemental uranium, etc.)

- Framatome plant at Hanford, WA
- Westinghouse fuel plant in Columbia, SC
- GE fuel plant in Wilmington, NC
- BWX fuel plant in Virginia
- Oak Ridge National Lab (X-Energy's TRISO production is happening there)
- Possibly Idaho National Lab (Terrapower MFSR experiment includes onsite fuel production)
- Los Alamos National Lab (Kairos's TRISO production is happening there)

068-6 (cont'd)

In addition, transport between all of these locations puts every community along the way at risk which DOE is minimizing or ignoring.

068-12

22. Since there are so many different fuel forms for the various reactor designs DOE is subsidizing, it is possible that there will need to be more facilities. If any of the proposed designs actually do go commercial, they may need to develop a larger facility of their own, not on DOE property. But again, all of this is so speculative, and it is difficult to believe that HA-LEU production would reach the scales DOE projects until the 2040s at the earliest.

068-13

23. DOE is ignoring that there is virtual consensus among experts that the only way for nuclear power to have a chance of succeeding is if there are one or two reactor designs, not 10. And that would require fewer fuel production facilities, not the burgeoning number DOE is now supporting. To make fuel for a small handful of reactors, all the different designs and fuel types (not even all requiring HA-LEU), the cost of producing the fuel alone is going to be expensive and likely plagued with quality control problems.

068-7 (cont'd)

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HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. See also Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of the CRD for further discussion of these topics.

068-8 DOE acknowledges the commenter's concern about taxpayer investment. As discussed in Chapter 1 of the EIS, DOE's Proposed Action is intended to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. As described in Section 2.1 of the HALEU EIS, DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. See Section 1.1 of the EIS and Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of the CRD for further information. Regarding funding, DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

068-9 DOE acknowledges the commenter's opposition to the Proposed Action. However, Congress in the Energy Act of 2020, directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of the HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for further discussion of these topics and DOE's responses. Section 2.6 of the HALEU EIS summarizes the environmental impacts of the proposed action. Section 3.9 of the HALEU EIS discusses Nonproliferation.

068-10 Depleted uranium is not a waste. It is a resource being stored for future use as needed. The DOE depleted uranium inventory is maintained consistent with all Federal, state, and local requirements. Conversion of depleted uranium hexafluoride

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24. The Draft HALEU EIS uses old environmental reviews for many of the fuel-"cycle" (chain) facilities and concludes that the difference in impacts would not be significant for this much higher enriched/concentrated fuel. But it does not acknowledge the contamination and struggles in those communities. The Draft HALEU EIS must be updated for the current understanding of climate change on water, wind, and other forces that impact nuclear reactors and fuel chain facilities.

068-6 (cont'd)

068-2 (cont'd)

25. It is incumbent on DOE to fully assess the negative impact that this fuel and the reactors (whose designs are yet to be technically completed, licensed, and built) will have on the environment and the global nuclear arms race and proliferation. Enriching fuel to 19.75% plus or minus 2% bumps it up to weapons grade, or nearly weapons grade. In context of current legislation to export nuclear technology the US would be deliberately proliferating nuclear weapons capable material around the world…even to countries with no security controls or which could become enemies.

26. Because of the inherently international nature of the nuclear fuel chain and current push to export nuclear technology, the dangers of proliferation of weapons grade nuclear material requires greater technical review and political review by arms control experts. HALEU fuel is at the edge or actually in the range of atomic bomb grade (equal to or greater than 20 % Uranium-235). It is incumbent on DOE as part of your federally mandated HALEU planning, to assess and report back to Congress on the proliferation dangers of this technology and the acceleration of the country and the world to a plutonium economy and reinvigorated nuclear weapons arms race and increasing danger of dirty bombs.

068-5 (cont'd)

We call on the Department of Energy (DOE) to address the environmental and public health problems at all of the existing nuclear fuel chain ("cycle") facilities. HALEU DEIS because it would make an enormous shift in the direction of communities, the country and world.

068-6 (cont'd)

This heightens the importance of this process above many others as it is essentially reviving an uncompetitive, polluting industry (dramatically increasing the intensity of the radioactivity), restarting the nuclear arms race, accelerating a plutonium economy and initiating an unending, possibly unsustainable national and international energy plan which has been legitimately shown to worsen not help climate change.

068-1 (cont'd)

Sincerely,

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(DUF6) to depleted uranium oxide (DU oxide) is ongoing at the Portsmouth and Paducah Sites. Construction and operation of these facilities were evaluated in the Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio, Site (DOE/EIS-0360) and the Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky, Site (DOE/EIS-0359). The depleted UF6 from the Proposed Action would be a small percentage of that currently being converted at these two sites. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, HALEU Spent Nuclear Fuel Storage and Disposition, HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more

Commenter No. 68 (cont'd): Diane D'Arrigo, Nuclear Information and Resource Service

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detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

068-11 The RFP will not result in contracts that come within the scope of Section 170d of the Atomic Energy Act and are therefore not eligible for Price Anderson Act coverage. DOE is entering into these contracts to encourage the development of commercial enrichment and deconversion capacity. The providers of the HALEU and the deconversion services to DOE will be undertaking activities for commercial purposes, away from any DOE site and subject to licensing by NRC as commercial enterprises and not as DOE activities. DOE will have no role in the operation of the enrichment or deconversion facilities under the contracts.

068-12 A detailed transportation analysis was performed for this EIS. Both radiological and nonradiological transportation impacts are described in Section 3.6, "Transportation," of the EIS and Section A.6, "Transportation," of Appendix A. Radiological impacts are those associated with the effects from low levels of radiation emitted during incident-free transportation and from the accidental release of radioactive materials. Nonradiological impacts are independent of the nature of the cargo being transported and are expressed as traffic accident fatalities resulting only from the physical forces that accidents could impart to humans. Details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Since the EIS does not identify specific locations for fuel cycle facilities, the EIS transportation analysis used some conservative assumptions about the distances traveled during transportation (considering longest distances between the potential locations/facilities of source and product materials [e.g., mines to conversion, conversions to enrichment, enrichment to fuel fabrication and/or deconversion, and deconversion to storage]). Therefore, the analysis is expected to bound the impacts regardless of where the facilities would be located. The analysis considered transportation of all forms of uranium materials: from the mines to the mills, from an ISR or mill to the conversion facility, from the conversion facility to enrichment facilities, from the enrichment facility to a deconversion facility, from the deconversion facility to a storage facility, and from the storage facility to the fuel fabrication facility. For the transportation analysis, all facilities were conservatively assumed to be independently sited (i.e., no co-location of facilities). As discussed in Section 3.6 and in Section A.6 of Appendix A of the Final HALEU EIS, the transportation activities would result in a small collective population risk, which is a measure of the total risk posed to society as a whole. Specific details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Table A-8 of Appendix A in the Final HALEU EIS summarizes the transportation risks for each activity within the HALEU fuel cycle. Site-specific locations are expected to be

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proposed in the future and would be evaluated by the cognizant regulatory agency, in many cases the Nuclear Regulatory Commission (NRC) and specific transportation routes and related impacts are expected to be evaluated during that process. See also Section 2.6, "Transportation," of the CRD for additional information.

068-13 Section 3.7.1 of the HALEU EIS addresses HALEU fuel fabrication facilities, including the potential need for multiple fuel fabrication facilities. A fuel fabrication facility could be sited anywhere in the United States as long as the facility meets NRC siting requirements. The production of HALEU may be accomplished through modification of an existing fuel fabrication facility or through development of a new fuel fabrication facility at an existing site, a brownfield site, or a greenfield site. DOE expects that any development of a larger fuel fabrication facility would be evaluated by the regulatory agencies responsible for such a facility. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. DOE expects that implementation of the Proposed Action would provide incentive for companies to invest in the development of larger HALEU fuel production capabilities which in turn would provide advanced reactor developers with the surety that fuel would be available for their reactor designs. In this final EIS, DOE has clarified that the estimates for HALEU are the best available estimates for potential future demand (see Section 1.1 of the EIS).

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To: HALEU-EIS
Cc: O"NEILL, Martin; SCHLUETER, Janet
Subject: [EXTERNAL] Comments of the Nuclear Energy Institute on the U.S. Department of Energy's Draft HALEU EIS (DOE/EIS-0559)
Date: Monday, April 22, 2024 10:37:11 PM
Attachments: Cover Letter to NEI Comments on DOE Draft EIS for HALEU Availability Program (4-22-2024).pdf
Atttachment NEI Detailed Comments on DOE Draft EIS for HALEU Availability Program (4-22-2024).pdf

Mr. Lovejoy:

Please find attached the Nuclear Energy Institute's (NEI) comments in response to the Department of Energy's Notice of Availability of the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU), 89 Fed. Reg. 16546 (Mar. 7, 2024). A cover letter and the comments are attached. Thank you for considering NEI's comments.

Best regards,

Martin O'Neill

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Commenter No. 69 (cont'd): Martin O'Neill, Nuclear Energy Institute

NUCLEAR ENERGY INSTITUTE

NUCLEAR CARBON-FREE ENERGY

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April 22, 2024

Mr. James Lovejoy
HALEU EIS Document Manager
U.S. Department of Energy, Idaho Operations Office
1955 Fremont Avenue, MS 1235
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Submitted by email to HALEU-EIS@nuclear.energy.gov

Subject: Nuclear Energy Institute Comments on Draft Environmental Impact Statement for DOE Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)

The Nuclear Energy Institute (NEI) hereby submits comments in response to the U.S. Department of Energy's (DOE) Notice of Availability of the Draft Environmental Impact Statement [DEIS] for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU). We appreciate DOE's continued commitment to support the development of the HALEU fuel cycle and to meet the agency's obligations under Section 2001 of the Energy Act of 2020. We also appreciate this opportunity to provide input on this important milestone in DOE's implementation of the HALEU Availability Program, which we believe is critical to the timely development of a robust and reliable domestic HALEU fuel supply chain.

As discussed in the attached comments, advanced nuclear reactors and their fuels represent a point of confluence among U.S. energy, climate, environmental, economic, and national security priorities, all of which undergird the urgent need for the Proposed Action. Furthermore, as DOE recognizes in the DEIS, there is a potential timing/coordination/cost issue with developing domestic commercial HALEU enrichment capability, and the HALEU Availability Program is necessary to encourage commercial producers to invest in the necessary fuel cycle infrastructure and gear up production to provide the expected amount of HALEU needed for commercial use or demonstration projects. The Proposed Action, in short, is essential for myriad reasons.

Overall, we believe the DEIS presents a comprehensive evaluation of the potential environmental impacts of the Proposed Action based on the best information available, consistent with the requirements of the National Environmental Policy Act (NEPA) and related regulations. DOE's use of a bounding analysis approach and reliance on prior NEPA analyses – particulary those prepared by the U.S. Nuclear Regulatory Commisison – are reasonable and appropriate under NEPA. Moroever, the DEIS amply demonstrates that DOE has independently reviewed and assessed those NEPA evaluations in making its environmental impact determinations. The DEIS also fully supports DOE's conclusions that the Proposed Action is the Preferred Alternative; the environmental impacts of the Proposed Action are likely to be small to moderate and subject to appropriate mitigation; and the benefits of using HALEU in advanced reactor fuels substantially outweigh any potential proliferation risks.

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069-1 DOE acknowledges your support for the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 69 (cont'd): Martin O'Neill, Nuclear Energy Institute

Mr. James Lovejoy
April 22, 2024

We hope that DOE finds our comments helpful. If you have any questions concerning the comments, please feel free to contact me at mjo@nei.org or 202-739-8139.

Sincerely,

Martin J. O'Neill

Martin J. O'Neill
Associate General Counsel

Attachment: Comments of the Nuclear Energy Institute on the U.S. Department of Energy's Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)

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Commenter No. 69 (cont'd): Martin O'Neill, Nuclear Energy Institute

Comments of the Nuclear Energy Institute on the U.S. Department of Energy's Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)

Draft HALEU EIS (DOE/EIS-0559)

On behalf of its members, the Nuclear Energy Institute (NEI)[1] submits these comments in response to the Department of Energy's (DOE) Notice of Availability of the Draft Environmental Impact Statement (DEIS) for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU).[2] NEI appreciates this opportunity to provide input on this important milestone in DOE's implementation of the HALEU Availability Program, which we believe is critical to the timely development of a robust and reliable domestic HALEU fuel supply chain. We also appreciate DOE's consideration of NEI's July 2023 scoping comments. While we offer some additional information and recommendations below, we believe the DEIS presents a comprehensive evaluation of the potential environmental impacts of the Proposed Action based on the best information available, consistent with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 CFR Parts 1500 through 1508), and DOE's NEPA regulations (10 CFR Part 1021).

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I. DOE's Purpose and Need Statement Should Reflect the Multiple National Policy Objectives Underlying the Need for an Advanced Nuclear Fuel Supply Chain in the U.S.

Section 1.1 (Purpose and Need for Agency Action) of the DEIS makes clear that facilitating the establishment of reliable commercial HALEU fuel production capabilities in the U.S. is both a statutory mandate and a commercial imperative. Section 2001(a)(1) of the Energy Act of 2020 states that DOE "**shall** establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HA-LEU for civilian domestic research, development, demonstration, and commercial use."[3] It also requires the establishment and periodic updating of a HALEU consortium to partner with DOE to support the availability of HALEU for civilian domestic demonstration and commercial use.[4] Section 2001 further directs DOE to "prioritiz[e] methods that would produce usable HA-LEU the quickest," and "to ensure that the activities carried out under this section do not cause any delay in the progress of any HA-LEU project between private

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[1] NEI's mission is to promote the use and growth of clean nuclear energy through efficient operations and effective policy. NEI has more than 340 members, including companies that own or operate nuclear power plants, reactor designers and advanced technology companies, architect and engineering firms, fuel suppliers and service companies, consulting services and manufacturing companies, companies involved in nuclear medicine and nuclear industrial applications, radionuclide and radiopharmaceutical companies, universities and research laboratories, labor unions, and international electric utilities.

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[2] 89 Fed. Reg. 16546 (Mar. 7, 2024).

[3] 42 USC 16281(a)(1) (emphasis added).

[4] 42 USC 16281(a)(2)(F). *See also* "U.S. Department of Energy HALEU Consortium," https://www.energy.gov/ne/us-department-energy-haleu-consortium.

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069-2 DOE acknowledges your support for the Proposed Action and development of a domestic HALEU supply chain and the bases cited. In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. Please see Section 1.1 of the EIS in which DOE has clarified the purpose and need. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's responses.

industry and the Department . . ."[5] Thus, DOE's conduct of these activities is not optional or discretionary – it is required by statute.

The DEIS notes that the Proposed Action addresses Section 2001(a)(2)(D)(v) of the Energy Act of 2020, and identifies the Proposed Action as "acquir[ing], through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent uranium-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production."[6] As such, DOE's Purpose and Need Statement appropriately reflects the aforementioned statutory and commercial objectives. However, NEI believes the Proposed Action also should be viewed in a broader context. As discussed below, advanced nuclear reactors and their fuels represent a point of confluence among U.S. energy, climate, environmental, economic, and national security priorities, all of which collectively undergird the urgent need for the Proposed Action.[7] Furthermore, as DOE recognizes in the DEIS, there is a potential timing/coordination/cost issue with developing domestic commercial HALEU enrichment capability, and the HALEU Availability Program is necessary to encourage commercial producers to invest in the necessary fuel cycle infrastructure and gear up production to provide the expected amount of HALEU needed for commercial use or demonstration projects.[8]

A. DOE and Congress Have Made Clear that Deploying Advanced Nuclear Reactors and Establishing the Necessary Domestic Fuel Cycle Are National Priorities

DOE Secretary Granholm has stated that the Administration is "very bullish" on building advanced nuclear reactors, and that the Administration already has invested significant resources in the research and development of such reactors.[9] Indeed, such efforts constitute a key component of the DOE Office of Nuclear Energy's *Strategic Vision*, which provides the "blueprint" for that office's effort to "achiev[e] its mission to advance nuclear energy science and technology to meet U.S. energy, environmental, and economic needs."[10] In its *Strategic Vision*, the Office of Nuclear Energy identified the following as three of its five goals to address challenges in the nuclear energy sector, help realize the potential of advanced nuclear technology, and leverage the unique role of the government in spurring innovation:

- Enable deployment of advanced nuclear reactors.
- Develop advanced nuclear fuel cycles.
- Maintain U.S. leadership in nuclear energy technology.

[5] 42 USC 16281(a)(2)(D), (J).

[6] DEIS, Vol. 1 at 1-16.

[7] *See* NEI, "Value of Advanced Nuclear," https://www.nei.org/advanced-nuclear-energy/value-of-advanced-nuclear.

[8] DEIS, Summary (Reader's Guide) at 1, 5; DEIS, Vol. 1 at 1-5 to 1-6.

[9] Adler, Ben, "U.S. 'very bullish' on new nuclear technology, Granholm says," *yahoo!news* (Nov. 6, 2021), https://news.yahoo.com/us-very-bullish-on-new-nuclear-technology-granholm-says-110016617.html.

[10] DOE, "Office of Nuclear Energy: Strategic Vision" at 2 (Jan. 2021), https://www.energy.gov/sites/prod/files/2021/01/f82/DOE-NE%20Strategic%20Vision%20-%2001.08.2021.pdf.

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DOE has strong support from Congress, which has sought to bolster both public and private sector efforts to develop, license, and commercialize advanced nuclear technologies. In September 2018, the Nuclear Energy Innovation Capabilities Act of 2017 was signed into law.[11] Among other things, it authorizes testing and demonstration of advanced reactors with private and public funding (through DOE's National Reactor Innovation Center) and cost-share grants to help fund advanced reactor licensing activities.[12]

Congress has appropriated substantial funding for DOE-administered programs aimed at fostering the development and demonstration of advanced nuclear technologies. For example, the Advanced Reactor Demonstration Program (ARDP) establishes the framework for public-private cost-sharing in several demonstration projects that will yield reliable, cost-effective, licensable, and commercially operational designs.[13] Under the ARDP, DOE will invest several billions of dollars over seven years with industry partners providing matching funds.[14]

The $1.2 trillion Bipartisan Infrastructure Investment and Jobs Act of 2021 reflects the U.S. Government's support for both preserving the current power reactor fleet and deploying advanced nuclear reactors.[15] It includes, among other things, continued funding of $2.5 billion for ARDP projects, authorizing assistance for feasibility studies for siting advanced reactors, a demonstration program for Regional Clean Hydrogen Hubs, and creation of the Office of Clean Energy Demonstrations within DOE.[16] The Inflation Reduction Act of 2022 also includes a wide range of incentives, such as production and investment tax credits, to promote the use of low-carbon technologies, including nuclear energy.[17]

As noted above, Congress recognized the urgency to deploy advanced reactors by establishing, in Section 2001 of the Energy Act of 2020, the HALEU Availability Program to provide a secure and reliable domestic supply of HALEU for such reactors. Additionally, as noted in the DEIS, Section 3131 of the recently enacted National Defense Authorization Act for Fiscal Year 2024 (Nuclear Fuel Security Act of 2023) seeks to expeditiously increase domestic production of HALEU to meet the needs of advanced nuclear reactor developers and the HALEU consortium.[18] The federal government's steadfast support for deployment of advanced reactors and associated fuel supply infrastructure is further manifested by Congress's passage of the Consolidated Appropriations

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[11] P.L. 115-248 (Sept. 28, 2018), www.congress.gov/bill/115th-congress/senate-bill/97.

[12] *Id.*

[13] DOE, Office of Nuclear Energy, "Advanced Reactor Demonstration Program," https://www.energy.gov/ne/advanced-reactor-demonstration-program.

[14] DOE, Office of Clean Energy Demonstrations, "Advanced Reactor Demonstration Projects," https://www.energy.gov/oced/advanced-reactor-demonstration-projects-0.

[15] P.L. 117-58, https://www.congress.gov/117/bills/hr3684/BILLS-117hr3684enr.pdf.

[16] *See* NEI, "Bipartisan Infrastructure Package Includes Major Investments in Nuclear Energy" (Nov. 9, 2021), https://www.nei.org/news/2021/infrastructure-package-major-investments-nuclear.

[17] P.L. 117-69, https://www.congress.gov/117/bills/hr5376/BILLS-117hr5376eas.pdf#page=448.

[18] DEIS, Vol. 1 at 1-13.

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Act, 2024 (H.R. 4366) last month.[19] Nuclear-related appropriations include, among others, $2.72 billion to support the build out of the U.S. nuclear fuel supply chain, $800 million across three years for a competitive grant program to advance Generation 3+ SMR deployment, and $316 million for the ARDP.[20] The U.S. House of Representatives' Atomic Energy Advancement Act (H.R. 6544) and the U.S. Senates ADVANCE Act (S.B. 1111) both seek to expedite the NRC licensing process, reduce licensing fees, accelerate deployment of advanced reactors, and reduce reliance on Russian fuel. Finally, just this month, the bipartisan Senate Advanced Nuclear Caucus was launched to "amplify the critical role nuclear energy plays in the United States, explore emerging nuclear technologies, and promote the goals and priorities of the U.S. nuclear industry."[21]

B. Deploying Advanced Reactors and Establishing a Domestic Nuclear Fuel Cycle Are Key to Meeting U.S. Long-Term Energy Needs and Climate Change Mitigation Goals

As the Organization for Economic Cooperation and Development's (OECD) Nuclear Energy Agency (NEA) has noted, "[a]ll credible models show that nuclear energy has an important role to play in global climate change mitigation efforts."[22] Expert modeling demonstrates that the most reliable, affordable low-carbon energy system requires a significant increase in nuclear generation globally alongside increases in wind, solar, and battery storage.[23] The need for new nuclear generation is only increasing with the rapid buildout of datacenters, crypto-mining facilities, "clean tech" factories, and other electricity-intensive industrial facilities that by themselves will require the addition of many gigawatts of capacity to the U.S. grid.[24]

NEA concluded that nuclear energy can support future climate change mitigation efforts in various ways, including via the long-term operation of current nuclear generation capacity and potential large-scale advanced nuclear new builds.[25] The nuclear industry's work to

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[19] https://www.congress.gov/bill/118th-congress/house-bill/4366/text.

[20] *See* DOE, "FY2024 Spending Bill Fuels Historic Push for U.S. Advanced Reactors" (Mar. 14, 2024), https://www.energy.gov/ne/articles/fy2024-spending-bill-fuels-historic-push-us-advanced-reactors.

[21] Press Release, "Risch, Warner Launch Advanced Nuclear Caucus" (Apr. 11, 2024), https://www.risch.senate.gov/public/index.cfm/pressreleases?ID=E25A869C-B0BE-469B-AF2D-921AD3FE0CEF.

[22] OECD-NEA, *Meeting Climate Change Targets: The Role of Nuclear Energy* (May 2022) (NEA Report), https://www.oecd-nea.org/jcms/pl_69396/meeting-climate-change-targets-the-role-of-nuclear-energy.

[23] For example, in its roadmap for reaching a net-zero emissions energy system by 2050, the International Energy Agency (IEA) concluded that use of nuclear energy must nearly double alongside expanded use of other carbon-free technologies. *See* IEA, *Net Zero by 2050: A Roadmap for the Global Energy Sector*, at 57 (May 2021), https://www.iea.org/reports/net-zero-by-2050.

[24] *See, e.g.*, Halper, Evan, "Amid explosive demand, America is running out of power," *The Washington Post* (Mar. 7, 2024), https://www.washingtonpost.com/business/2024/03/07/ai-data-centers-power/; Kearney, Laila et al., "US electric utilities brace for surge in power demand from data centers," *Reuters* (Apr. 10, 2024), https://www.reuters.com/business/energy/us-electric-utilities-brace-surge-power-demand-data-centers-2024-04-10/#:~:text=Longer%20term%20power%20demand%20from,over%2035%20GW%20by%202030.

[25] NEA Report at 7, 16. It warrants emphasis that nuclear energy currently produces nearly half of the nation's carbon-free electricity. In 2023 alone, U.S. nuclear-generated electricity avoided approximately 439 million metric tons of carbon dioxide emissions that would otherwise have come from fossil fuel-fired generation units. In addition to providing highly-reliable and dispatchable 24/7 carbon-free energy, nuclear power has other significant

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commercialize numerous advanced nuclear reactor designs (including small modular reactors) this decade will greatly expand nuclear energy's ability to reduce carbon emissions from the energy supply.[26] In addition to producing electricity, these technologies – which include additional passive and inherent safety features – are expected to support hybrid energy systems and applications, including combined heat and power (cogeneration) for heavy industry and resource extraction, hydrogen and synthetic fuel production, desalination, and off-grid applications.[27]

DOE has similarly concluded that nuclear energy will "play a role in the transition to a clean energy economy by fundamentally enabling our nation's targets for clean, carbon-free electricity as well as non-electric energy markets," giving us "the potential to decarbonize many industrial sectors in the United States and abroad."[28] Indeed, DOE's March 2023 *Pathways to Commercial Liftoff: Advanced Nuclear* (Liftoff Report) concludes that "[a]chieving net-zero in the U.S. by 2050 would require ~550–770 GW of additional clean, firm capacity; modeling results indicate demand for 200+ GW of new nuclear capacity."[29] Contrary to statements made by members of the public during DOE's April 3, 2024, public hearings, the large-scale deployment of renewables and battery storage technologies will not supplant the need for additional nuclear generating capacity. As discussed in the *Liftoff Report*, system-level decarbonization modeling, regardless of renewables deployment, indicates that the U.S. would need significantly more clean, firm capacity to reach net-zero, and nuclear power is among the most viable options:

> Multiple system level decarbonization modeling exercises over the last two years have concluded that, especially with estimates for renewables buildout that account for limitations from transmission expansion and land use, **significant new nuclear power would be required by 2050**. These estimates for limitations on renewables buildout come from current understanding of land-use intensity, regional siting requirements, supply chain, transmission, and interconnection difficulties that increasingly impact utility-scale deployment. Throughout this report, 200 GW of new advanced nuclear power capacity is used as a benchmark for substantiating what it would take to deploy at scale, a mid-point from modeling exercises that appears ambitious yet achievable.
>
> This level of deployment is consistent with *The Long-Term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050*, **which includes**

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environmental benefits. Nuclear plants, for example, do not emit air pollutants like sulfur oxides, nitrogen oxides, and mercury.

[26] *See* NEA Report at 7, 16-17, 22-28.

[27] *See id.* at 7,8, 22, 28-32.

[28] DOE, Office of Nuclear Energy, "Q&A: Acting Assistant Secretary Dr. Kathryn Huff Shares Her Vision for the Future of Nuclear Energy" (June 24, 2021), https://www.energy.gov/ne/articles/qa-acting-assistant-secretary-dr-kathryn-huff-shares-her-vision-future-nuclear-energy.

[29] DOE, *Pathways to Commercial Liftoff: Advanced Nuclear* (Mar. 2023) (DOE Liftoff Report), https://liftoff.energy.gov/advanced-nuclear/.

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scenarios with substantial increases in U.S. nuclear capacity and electricity generation.[30]

The clear demand for new advanced nuclear power capacity in the United States will drive the concomitant need for a secure and reliable domestic HALEU fuel supply chain. Nevertheless, the Proposed Action is needed to spur near-term investment in the necessary fuel cycle infrastructure.

C. Establishing a Domestic HALEU Fuel Cycle Is Necessary to Realize the Vast Economic Potential of Deploying U.S. Advanced Reactors Domestically and Globally

As noted in DOE's *Liftoff Report*, nuclear power has the highest economic impact of any power generation source.[31] The current U.S. nuclear generating fleet contributes approximately $60 billion annually to the gross domestic product (GDP). Nuclear power plants also serve as the economic backbone for communities in which they operate, producing more than $12 billion annually in federal and state tax revenue.[32]

Nuclear power plants are engines for job creation.[33] Construction of a new nuclear plant can provide thousands of well-paying jobs. Today, the U.S. nuclear energy sector directly employs nearly 100,000 people in long-term jobs with salaries that are 50 percent higher on average than those created by other electricity generation sources.[34] Maintenance work at existing plants accounts for an estimated 20 million union person-hours annually.[35] Recruiting from universities, community colleges, the military and the trades, nuclear power plants provide high-quality jobs to the whole community. In total, these facilities are responsible for approximately 475,000 direct and secondary jobs.[36]

Nuclear is also one of few power generation sources that can preserve the volume of high-paying jobs from retiring fossil-fuel facilities. DOE has explicitly recognized this fact, noting that "[a]dvanced nuclear can play a critical role in strengthening energy security, reliability, and affordability while generating high-quality, high-paying jobs and facilitating an equitable energy transition."[37] As further explained in the *Liftoff Report*, "[a]n effective energy transition is one that preserves the viability and livelihood of the communities impacted by the shift to clean energy sources."[38] DOE national laboratory studies estimate that up to 80% of existing coal power plant

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[30] *DOE Liftoff Report* at 7.

[31] *Id.* at 13.

[32] Testimony for the Record, Maria Korsnick, President and Chief Executive Officer, NEI, Before the Subcommittee on Energy, Climate, and Grid Security and House Committee on Energy and Commerce, at 4 (July 18, 2023) (Korsnick Testimony), https://www.nei.org/resources/testimony/maria-korsnick-testifies-on-nuclear-legislation.

[33] *Id.*

[34] *Id.* at 4-5. As the *Liftoff Report* notes, nuclear power plants have ~300% of the jobs per GW when compared to wind power, and the pay of nuclear workers is ~50% higher than that in the wind or solar sectors.

[35] Korsnick Testimony at 5

[36] *Id.*

[37] *DOE Liftoff Report* at 4.

[38] *Id.* at 14.

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sites may be eligible for advanced nuclear plants, allowing utilities to invest in a new plant to repurpose the existing footprint and possibly infrastructure, while also preserving and expanding high-paying jobs in local communities.[39] As such, DOE has concluded that replacing retired fossil facilities with nuclear plants "present[s] critical opportunities to ensure an equitable transition to a decarbonized grid while increasing the domestic base and manufacturing capabilities."[40]

Establishing a robust domestic HALEU fuel cycle that can support the deployment of U.S. advanced reactor technologies is also critical to our ability to compete in a rapidly changing global economic environment. Reactor exports allow the U.S. to form 100-year strategic relationships around the world that span the construction, operation and decommissioning of a plant. In the current global market, however, U.S. companies must compete against companies that have vast state-backed financial and political resources, particularly from Russia and China.[41] At present, Russia dominates the global enrichment services market for low-enriched uranium, is the only commercial supplier of the HALEU required by most advanced reactor designs, and holds a significant share of the uranium conversion market. Expanding domestic fuel supply chain capabilities is thus critical to ensure the buildout of new reactors using innovative U.S. technologies. Given that global demand for U.S. advanced nuclear reactors is expected to accelerate as they are licensed and deployed, the U.S. must position itself to meet that demand and reap the many billions of dollars of expected economic benefits. This will not be possible unless we first establish a reliable domestic HALEU fuel supply, which, in turn, will enable the U.S. to be a competitive exporter of advanced nuclear reactors and their associated fuels.

D. The Proposed Action Is Also Needed to Support Vital National Security Interests

Developing a secure, reliable, and economically competitive domestic nuclear fuel cycle to support current and advanced reactors is also a national security imperative.[42] Indeed, DOE has expressly recognized that "nuclear power is intrinsically tied to national security."[43] China and Russia are aggressively seeking to expand their geopolitical leverage with nuclear technology export sales by their state-owned nuclear companies. This, in turn, undermines American leadership in nuclear energy safety, security, and nonproliferation matters. As Congress has recognized, establishing the necessary domestic infrastructure will require billions of dollars and years to sufficiently fill the gap currently served by Russia given years of atrophy of the U.S. nuclear fuel supply chain. Thus, it is critical that the U.S. government act expeditiously. The Proposed Action is a vital step in establishing a diverse, secure, and reliable fuel supply chain for U.S. advanced reactor technologies.

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[39] DOE, *Investigating Benefits and Challenges of Converting Retiring Coal Plants into Nuclear Plants Nuclear Fuel Cycle and Supply Chain* (INL/RPT-22-67964, Revision 2) (Sept. 2022), https://doi.org/10.2172/1886660.

[40] *DOE Liftoff Report* at 14.

[41] Korsnick Testimony at 11.

[42] *See, e.g.*, Gattie, D. & Hewitt, M., *National Security as a Value-Added Proposition for Advanced Nuclear Reactors: A U.S. Focus*," *Energies*, MDPI, vol. 16(17), pages 1-26 (Aug. 2023), https://www.mdpi.com/1996-1073/16/17/6162.

[43] DOE, *Restoring America's Competitive Nuclear Advantage – A Strategy to Assure U.S. National Security* (2020) (Apr. 2020), https://www.energy.gov/strategy-restore-american-nuclear-energy-leadership.

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The national security risks of continued reliance on Russian-origin fuels cannot be overstated. Those risks have been highlighted by Russia's 2022 invasion of Ukraine, which prompted numerous sanctions and other restrictions on Russian energy by the U.S. and its allies.[44] Notably, in April 2023, the U.S. and four allied countries announced their "collective intent to reduce reliance on civil nuclear and related goods from Russia, including working to assist countries seeking to diversify their nuclear fuel supply chains."[45] Although the initial U.S. sanctions that followed Russia's invasion of Ukraine excluded Russian suppliers of uranium, Congress has recently signaled its intention to end reliance on Russia and to ban Russian nuclear fuel imports. For example, H.R. 1042, the "Prohibiting Russian Uranium Imports Act," would ban Russian imports 90 days from enactment, subject to a short-term waiver process that would permit continued imports through 2027 (albeit through a process and scope to achieve the waiver that are not adequately clarified in the legislation).[46] Moreover, the $2.72 billion recently appropriated by Congress to expand domestic nuclear fuel production is contingent on the administration or Congress imposing a domestic prohibition or limitation on Russian fuel imports.[47]

069-2 (cont'd)

In short, the rapid expansion of our nuclear fuel infrastructure is critical to establishing a secure and reliable HALEU fuel supply for U.S advanced reactors deployed both at home and abroad, increasing our international competitiveness, and ensuring that the highest global standards in nuclear safety, security and nonproliferation are met.

II. The DEIS Correctly Concludes That the Proposed Action Is the Preferred Alternative

NEI fully concurs with DOE's conclusion that there are no reasonable alternatives to the Proposed Action that would fulfill the purpose and need for agency action, such that the Proposed Action is the Preferred Alternative.[48] The DEIS correctly notes that not implementing the Proposed Action – i.e. the No Action Alternative or status quo – "would be contrary to Congressional direction under Section 2001 of the Energy Act of 2020" (as well as the Office of Nuclear Energy's *Strategic Vision*).[49] Moreover, because a sufficient domestic commercial capability to produce HALEU

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069-3 (cont'd)

[44] *See, e.g.*, Testimony of Dr. Kathryn Huff, Assistant Secretary for Nuclear Energy, DOE, Before the Committee on Oversight and Accountability, U.S. House of Representatives (Jan. 18, 2024) (Jan. 2024 Huff Testimony), https://oversight.house.gov/wp-content/uploads/2024/01/Dr.-Huff-Testimony.pdf ("The Russian Federation's brutal invasion of Ukraine has demonstrated the grave threat to global energy security posed by dependence on Russian-supplied fuels.").

[45] DOE, "Statement on Civil Nuclear Fuel Cooperation Between the United States, Canada, France, Japan, and the United Kingdom" (Apr. 17, 2023), https://www.energy.gov/articles/statement-civil-nuclear-fuel-cooperation-between-united-states-canada-france-japan-and.

[46] https://www.congress.gov/bill/118th-congress/house-bill/1042/text. *See also* Jan. 2024 Huff Testimony, https://oversight.house.gov/wp-content/uploads/2024/01/Dr.-Huff-Testimony.pdf ("To decouple U.S. dependence on Russian enriched uranium, in October 2023 President Biden requested $2.16 billion in supplemental funding to improve our long-term, domestic enrichment capabilities for low-enriched uranium and high-assay low-enriched uranium. This funding in conjunction with a long-term ban on enriched uranium product imports from the Russian Federation into the U.S. is essential to reestablishing U.S. civil nuclear energy security.")

[47] Consolidated Appropriations Act, 2024 (H.R. 4366) at 448, https://www.congress.gov/bill/118th-congress/house-bill/4366.

[48] DEIS, Vol. 1 at 2-21.

[49] *Id.*

069-3 DOE acknowledges your preference for the Proposed Action. DOE reiterates the Council on Environmental Quality (CEQ) statement: "Commenting is not a form of 'voting' on an alternative" (CEQ 2021). The number of comments received for or against a particular alternative does not dictate the action that a Federal agency must take. As stated in Section 1.1 of the HALEU EIS, the purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. The stated purpose and need for the Proposed Action is met by a narrowly defined scope of activities. DOE identified one alternative, which was considered for evaluation, but dismissed from analysis. See Section 2.4, "Alternatives Considered but Dismissed from Detailed Analysis," for further discussion.

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through enrichment of natural uranium or LEU does not exist in the United States, the No Action Alternative would necessitate U.S. dependence on foreign sources of HALEU. That outcome also runs directly counter to Congress' and the Administration's plans to prohibit imports of uranium from Russia – currently the sole supplier of commercial HALEU. As the DEIS further notes, the lack of a secure and reliable domestic HALEU fuel supply also likely would impede the demonstration of current advanced reactor technologies and the development of future technologies.[50]

During the April 3 public hearings, several commenters took issue with DOE's discussion of the No Action Alternative, and suggested that the U.S. should rely on other energy sources (e.g., renewables, battery storage, and fusion) to the exclusion of advanced nuclear technologies. That position, however, contravenes the express will of Congress, as embodied in the federal laws and programs described above. Collectively, those laws and programs were designed to accelerate the commercialization and deployment of advanced reactors, and to catalyze private investment in new HALEU production capacity. The views expressed by several commenters are also fundamentally incompatible with the strategic goals of DOE's Office of Nuclear Energy, as set forth in its *Strategic Vision*. Finally, such commenters overlook the numerous studies conducted by the federal government, states, industry, NGOs, and other entities in recent years.[51] Those studies demonstrate that the U.S. needs more nuclear energy to achieve its climate, energy, economic, and national security goals, notwithstanding the rapid buildout of renewables.

Section 2001(a)(2)(D) directs DOE to "consider options for acquiring or providing HALEU from a stockpile of uranium owned by the Department, or using enrichment technology" deployed in the United States.[52] For purposes of its NEPA analysis, DOE considered in DEIS Section 2.4.1 the option of producing HALEU by downblending existing surplus stockpiles of HEU.[53] DOE appropriately dismissed that option from further analysis. While some limited downblending can be performed by temporarily repurposing existing facility capabilities, the amount of HALEU produced (e.g., 15 MT) would be grossly insufficient to meet the Proposed Action (i.e., the acquisition of 290 MT of HALEU). Furthermore, it would not encourage the development of the commercial capability needed to establish a "reliable and adequate" HALEU fuel cycle, the stated purpose and need for the Proposed Action and ultimate goal of Section 2001.[54] Thus, NEI agrees with DOE that "the use of DOE stockpiles of HEU to produce HALEU would provide limited and, at most, short-term supplies of HALEU, which would not support commercialization."[55]

Given that DOE did not identify any reasonable alternatives to the Proposed Action, it appropriately focused its environmental impact analysis on the Proposed Action and the No-Action Alternative. This approach is acceptable under NEPA. It is well established that "an agency

069-3 (cont'd)

[50] *Id.* at 1-3.

[51] *See* DOE Liftoff Report at 7.

[52] 42 USC 16281(a)(2)(D).

[53] DEIS, Vol. 1 at 2-21.

[54] See 42 USC 16281(a)(2)(6)(B)(referring to "the date on which HA-LEU is available to provide a **reliable and adequate supply** for civilian domestic advanced nuclear reactors in the commercial market") (emphasis added).

[55] DEIS, Vol. 1 at 2-21.

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need follow only a 'rule of reason' in preparing an EIS, [] and [] this rule of reason governs both **which** alternatives the agency must discuss, and the **extent** to which must discuss them."[56] An agency is required to examine only alternatives necessary to permit a reasoned choice,[57] and its alternatives analysis therefore is judged on the "substance of the alternatives" rather than the "sheer number of alternatives examined."[58] Importantly, NEPA "does not impose a numerical floor on alternatives to be considered."[59] Moreover, the consideration of alternatives is bounded by a "notion of feasibility,"[60] such that "[a]lternatives that do not advance the purpose of the [project] will not be considered reasonable or appropriate."[61] As such, courts have held that an agency's detailed consideration of only two alternatives (i.e., one action alternative and the no-action alternative) in its NEPA review document can satisfy NEPA's requirements.[62] Finally, even assuming an environmentally preferred alternative exists – which it does not in this case – "NEPA does not require the environmentally preferred alternative be chosen, only that 'the agency considered the environmental consequences of its proposed actions.'"[63]

069-3 (cont'd)

III. DOE's Use of a Bounding Analysis Approach and Reliance on Prior NRC Environmental Analyses Are Reasonable and Appropriate Under NEPA

069-4

As DOE notes, site-specific details (such as the locations of enrichment and deconversion services) and whether activities would result in modifying existing facilities or constructing new facilities are not yet determined.[64] Therefore, to bound the potential environmental impacts, DOE analyzed the potential impacts associated with (1) modifications to/expansions of existing

[56] *Citizens Against Burlington v. Busey*, 938 F.2d 190, 195 (D.C. Cir. 1991) (citing *NRDC v. Morton*, 458 F.2d 827, 834, 837 (D.C. Cir. 1972); quoting *Alaska v. Andrus*, 580 F.2d 565, 475 (D.C. Cir.), *vacated in part as moot sub. nom. Western Oil & Gas Ass'n v. Al*aska, 439 U.S. 922 (1978)) (emphasis in original).

[57] *Morton*, 458 F.2d at 836.

[58] *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1246 (9th Cir. 2005).

[59] DEIS, Vol. 1 at 1-1.

[60] *Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 551 (1978).

[61] *Native Ecosystems*, 428 F.3d at 1247.

[62] *See*, *e.g.*, *Native Ecosystems*, 428 F.3d at 1245-49 ("[T]o the extent that [plaintiff] is complaining that having only two final alternatives – no-action and a preferred alternative – violates the regulatory scheme, a plain reading of the regulations dooms that argument. So long as 'all reasonable alternatives' have been considered and an appropriate explanation is provided as to why an alternative was eliminated, the regulatory requirement is satisfied."); *N. Idaho Cmty. Action Network v. U.S. Dept. of Transp.*, 545 F.3d 1147 (9th Cir. 2008) ("Under these circumstances, we hold that the Agencies fulfilled their obligations under NEPA's alternatives provision when they considered and discussed only two alternatives in the 2005 EA."); *Citizens Against Burlington*, 938 F.2d at 199 (holding that the FAA, in approving a city's plan to expand an airport, complied with NEPA in publishing an EIS that discussed in depth only the two alternatives of approving the expansion and not approving it).

069-3 (cont'd)

[63] *Vermonters for a Clean Env't, Inc. v. Madrid*, 73 F.Supp.3d 417, 428 (D.Vt. 2014) (quoting *Sierra Club v. U.S. Army Corps of Eng'rs*, 772 F.2d 1043, 1050 (2d Cir. 1985)). *See also N.C. Alliance for Transp. Reform, Inc. v. U.S. Dep't of Transp.*, 713 F.Supp.2d 491, 501 (M.D.N.C. 2010) (noting that NEPA "requires that an agency take a 'hard look' at the environmental consequences of a proposed action, not that the agency select the most environmentally benign alternative.").

[64] The locations of potential HALEU fuel cycle facilities are subject to an ongoing procurement process, including DOE's review of industry responses to Requests for Proposals.

069-4 (cont'd)

069-4 DOE acknowledges your support for DOE's NEPA approach. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

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uranium fuel cycle facilities, (2) construction and operation of new HALEU facilities at existing industrial facilities/sites (i.e., brownfield sites), and (3) construction and operation of facilities at undeveloped sites (i.e., greenfield sites).[65] As discussed in DEIS Section 1.0.6 (Current NEPA Analyses), DOE based its impact analyses largely on NEPA analyses for both existing and previously-proposed fuel cycle facilities licensed by the NRC.[66]

Under NEPA's rule of reason, agencies are allowed to select their own methodology so long as that methodology is reasonable.[67] It also is settled law that NEPA requires an agency to provide only "a reasonably thorough discussion of the significant aspects of the probable environmental consequences" of a proposed action.[68] NEPA does not call for certainty or precision, but an estimate of anticipated (not speculative) impacts that is based on "the best available scientific information."[69] Nor does NEPA require an agency to undertake studies to obtain information that is not already available.[70]

DOE's reliance on bounding analysis and prior NEPA evaluations are reasonable in these circumstances and permissible under NEPA and DOE's implementing regulations and guidance.[71] DOE NEPA guidance describes a bounding analysis as follows:

> A bounding analysis is an analysis designed to identify the **range** of potential impacts or risks, both upper and lower. Such an approach might be used in an EA or EIS, for example, to simplify assumptions, address uncertainty, or because

069-4 (cont'd)

[65] DEIS, Vol. 1 at 1-1 to 1-2, 2-22 to 2-23.

[66] *Id.* at 1-11 to 1-12. Table 1.0-1 summarizes the NEPA coverage for facilities or types of facilities that might be among those considered for the HALEU fuel cycle.

[67] *Town of Winthrop v. FAA*, 535 F.3d 1, 11–13 (1st Cir. 2008); *Hughes River Watershed Conservancy v. Johnson*, 165 F.3d 283, 289 (4th Cir. 1999).

[68] *WildEarth Guardians v. Mont. Snowmobile Ass'n*, 790 F.3d 920, 924 (9th Cir. 2015) (*quoting City of Sausalito v. O'Neill*, 386 F.3d 1186, 1206 (9th Cir. 2004)).

[69] *Biodiversity Conservation All. v. Jiron*, 762 F.3d 1036, 1051 (10th Cir. 2014) (internal citations and quotations omitted).

[70] *See, e.g., Lee v. U.S. Air Force*, 354 F.3d 1229, 1244 (10th Cir. 2004).

[71] *See, e.g., New York v. NRC*, 824 F.3d 1012, 1019 (D.C. Cir. 2016) (approving the NRC's "use of conservative bounding assumptions" and noting "the opportunity for concerned parties to raise site specific differences at a time of a specific site's licensing"); 10 CFR 1021.200(d) ("During the development and consideration of a DOE proposal, DOE shall review any relevant planning and decisionmaking documents, whether prepared by DOE or another agency, **to determine if the proposal or any of its alternatives are considered in a prior NEPA document**.") (emphasis added); DOE, *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements – Second Edition*, at 2 (Dec. 2004) (2004 DOE NEPA Guidance) ("When preparing EAs and EISs, sometimes information from existing NEPA documents can be used. … Similarly, information from other DOE (or other agency) documents, such as documented safety analyses, may be summarized and expressly incorporated by reference into EAs and EISs."); *Cascadia Wildlands v. U.S. Forest Serv.*, 937 F.Supp.2d 1271, 1276 (D. Or. 2013) (noting that federal regulations "authorize the agencies to incorporate additional scientific data and documents by reference into the NEPA documents").

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> expected values are unknown. As a practical matter, a bounding analysis most often is used to provide conservatism in the face of uncertainty.[72]

This is precisely what DOE has done in the DEIS; i.e., it has conservatively estimated the potential range of environmental impacts of the relevant fuel cycle activities, incorporating into its assessment the different characteristics of the various site types identified above. The DEIS, in fact, identifies various conservatisms built into DOE's analyses. For instance, DOE conservatively assumed that the HALEU fuel cycle facilities would require a full complement of newly-constructed support facilities and structures.[73] In its transportation analysis, DOE used the maximum distances between existing facilities to present a conservative analysis of the impacts of HALEU transportation between existing facilities, brownfield sites, and greenfield sites.[74]

DOE correctly notes that certain activities related to the Proposed Action will require permits, licenses, and/or license amendments from other agencies having regulatory authority, such as the NRC and its Agreement States, the Department of the Interior's Bureau of Land Management, and state environmental agencies.[75] Thus, consistent with representations made in its Notice of Intent to Prepare an EIS, DOE utilized prior NRC NEPA evaluations "to ensure a robust and efficient DOE NEPA analysis, as well as to streamline and inform the process at DOE."[76] In doing so, DOE thoroughly reviewed the analyses in the relevant NRC NEPA review documents, and summarized and incorporated by reference the findings contained in those previously-issued documents. Appendix A (Environmental Consequences Supporting Information) to the DEIS contains activity-specific lists of NEPA documentation used to estimate impacts from each activity associated with the Proposed Action and several reasonably foreseeable activities that could result from implementation of the Proposed Action. In short, DOE's decision to leverage prior NEPA evaluations is fully consistent with NEPA (including new Section 107, "Timely and Unified Federal Reviews," as added by the Fiscal Responsibility Act of 2023[77]), CEQ and DOE regulations, and established NEPA review practices that have been affirmed by the courts.

069-4 (cont'd)

IV. The DEIS Reasonably Concludes That the Environmental Impacts of the Proposed Action Are Likely to Be Small to Moderate and Subject to Appropriate Mitigation

As summarized in DEIS Table 2.6-1, the environmental impacts of construction and operation of HALEU facilities resulting from the Proposed Action's implementation are expected to be SMALL. Any potentially MODERATE or LARGE impacts are generally associated with land-disturbing activities (e.g., site preparation and construction), transient in nature, related to site-specific

069-5

[72] 2004 DOE NEPA Guidance, at 16 (emphasis in original).

[73] DEIS, Vol. 1 at 3-3.

[74] *Id*. at 3-1, 4-3.

[75] *Id*. at 3-1.

[76] DOE, Notice of Intent to Prepare an [EIS] for [HALEU] Program Activities in Support of Commercial Production of HALEU Fuel, 88 Fed. Reg. 36,573, 36,574 (June 5, 2023).

[77] Fiscal Responsibility Act of 2023, Public Law 118-5, § 321 (Builder Act) (amending 42 U.S.C. 4321 et seq.), https://www.congress.gov/bill/118th-congress/house-bill/3746/summary/00.

069-4 (cont'd)

069-5 Thank you for your comment. DOE acknowledges your preference for the Proposed Action. Please see DOE's response to Comment 069-3.

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uncertainties (not anticipated HALEU facility operations), and conducive to mitigation.[78] As DOE notes, mitigation measures are expected to be incorporated, as appropriate, as part of the required site-specific licensing, permitting, and associated NEPA or equivalent evaluation processes conducted by the NRC and other agencies.[79]

DOE's conclusions regarding the overall environmental impacts of the Proposed Action are consistent with actual operating experience and the conclusions reached by the NRC in its numerous prior NEPA evaluations for existing and previously proposed fuel cycle facilities. Nuclear energy has among the **lowest overall life-cycle impacts** of any generation source.[80] Sections 2.6.2 and 3.10 of the DEIS recognize this fact in discussing the No Action Alternative.[81] Due to its high energy density, nuclear power also has a much smaller geographic footprint than other energy generation sources, including wind, solar, and hydropower.[82] In fact, nuclear energy's land use per unit of electricity generated (based on a life-cycle assessment) is one to two orders of magnitude less than that of renewable energy sources.[83] As a result, nuclear power helps avoid adverse climate change, air quality, human health, land use, and ecological impacts that may disproportionately affect vulnerable communities. Insofar as the HALEU fuel cycle activities encompassed by the Proposed Action have some environmental impacts, those impacts would be offset by "expected reduction of CO_2e emissions if the power produced were from reactors fueled by the up to 290 MT of HALEU instead of power produced by existing electrical power generation sources within regions across the United States."[84] DOE estimates that the electrical

069-5 (cont'd)

[78] DEIS, Vol. 1 at 2-25 to 2-27. As defined in the DEIS, mitigation includes: (1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action; or (5) compensating for an impact by replacing or providing substitute resources or environments. *Id.* at 7-6.

[79] *Id.* at 2-24. Importantly, "an agency may properly base its evaluation of environmental impacts on the assumption that other specialized agencies with jurisdiction will enforce permits and related mitigation measures according to the law." *Okanogan Highlands All. v. Williams*, No. CIV. 97-806-JE, 1999 WL 1029106, at *4 (D. Or. Jan. 12, 1999) (citing *No GWEN All. of Lane Cty., Inc. v. Aldridge*, 855 F.2d 1380, 1386-87 (9th Cir. 1988); *City & Cty. of San Francisco v. United States*, 615 F.2d 498, 501 (9th Cir. 1980)).

[80] *See DOE Liftoff Report* at 8; IAEA, *Nuclear Power and Sustainable Development*, at 50-51 (2016), http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1754web-26894285.pdf. Life-cycle assessments consider impacts related to operation, and the generation source's "construction and decommissioning **as well as the fuel cycle**" – *i.e.*, from "cradle to grave." *See id.* at 5, 38 (emphasis added). *See also* National Renewable Energy Laboratory (NREL), *Life Cycle Assessment Harmonization*, https://www.nrel.gov/analysis/life-cycle-assessment.html.

[81] DEIS, Vol. 1 at 2-35 to 2-36, 3-36 (noting that the full-lifecycle greenhouse gas (GHG) emissions of nuclear power are 12 g CO_2e/kWh, which are substantially lower than those of coal and natural gas-power generation sources (820 g CO_2e/kWh and 490 g CO_2e/kWh, respectively), and even lower than the lifecycle emissions of hydroelectric and solar produce (24 g CO_2e/kWh and 41 g CO_2e/kWh, respectively)). Consequently, "using coal or natural gas (and even hydroelectric and solar) to generate electricity would result in higher GHG emissions." *Id.* at 2-36, 3-36.

[82] *DOE Liftoff Report* at 11 and Table 8. The *Liftoff Report* notes that to meet 2050 decarbonization targets using unconstrained renewables, an area of 600,000 sq-km would be required to supply power for the U.S. (i.e., roughly the size of New Mexico and Arizona, combined).

[83] Our World in Data, "How does the land use of different electricity sources compare?" (June 16, 2022), https://ourworldindata.org/land-use-per-energy-source.

[84] DEIS, Vol. 1 at 2-38.

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power generated by HALEU-fueled advanced reactors would result in between 47.4 million and 326 million MT lower CO_2e emissions compared to power generated from the combination of current non-nuclear sources, and yield "a cumulative benefit to climate change."[85]

Importantly, any site-specific licensing process conducted by the NRC for new or modified fuel cycle facilities will include an appropriate level of NEPA review (including, in many cases, an EIS) that will address the site-specific uncertainties that DOE has addressed through its conservative, bounding analysis approach. NRC licensing proceedings, moreover, include extensive public participation opportunities. Those opportunities include public meetings near the proposed site to familiarize the public with the safety and environmental aspects of the application, the planned location and type of plant, and the NRC's licensing process. The NRC also holds public meetings with the applicant during the licensing process to discuss the facility's design and construction and other relevant issues. During its environmental review of an application under NEPA and 10 CFR Part 51, the NRC solicits public comments on the scope of the review and holds related public meetings near the proposed site. The NRC also offers members of the public opportunities to request a hearing on the application and to participate in the hearing process through various channels (e.g., as an intervenor/party, interested governmental entity, limited appearance statements). The NRC notifies the public of these various opportunities through a combination of means, including *Federal Register* notices, press releases, and media ads. It also coordinates closely with other Federal, State, local, and Tribal governmental entities, and conducts targeted outreach to local communities, including those that may have environmental justice concerns.

069-5 (cont'd)

V. The Benefits of Using HALEU in Advanced Reactor Fuels Outweigh Any Potential Proliferation Risks

In response to public comments received during the EIS scoping process, Section 3.9 of the DEIS discusses nonproliferation concerns associated with potential use and misuse of HALEU and supporting technologies associated with implementation of the Proposed Action. NEI agrees with DOE's conclusion that adequate controls exist to reduce the proliferation concerns to acceptable levels, and that the benefits of using HALEU in advanced reactor fuels outweigh the potential proliferation risks.[86] As DOE notes, both the NRC and the IAEA have addressed the use of HALEU fuel and have implemented appropriate domestic and international controls, respectively. Through a robust regulatory framework, NRC ensures that all civilian uses of HALEU material will be licensed in a way that protects the public health and safety and is not inimical to the common defense and security. Like all NRC-licensed materials, the use of HALEU is subject to stringent

069-6

069-6 DOE acknowledges your comments. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and the benefits of using HALEU in advanced reactor fuels outweigh potential proliferation risks.

[85] *Id.* at 2-38, 4-5.

[86] *Id.* at 3-34. The expected benefits of using HALEU fuel include, for example, the ability to design smaller reactors that use different coolants and generate more power per unit of volume, improved fuel utilization due to higher burnup, improved thermal efficiency with higher operating temperatures, longer operating cycles, shorter refueling periods, inherent safety features, and reduced fuel waste volumes. *See* DEIS, Vol. 1 at 1-3; DOE, *Pros and Cons Analysis of HALEU Utilization in Example Fuel Cycles* (ANL/NSE-22/21) (June 2023), https://doi.org/10.2172/1985692.

069-5 (cont'd)

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physical security, safeguards, and material control and accounting (MC&A) requirements.[87] As the NRC summarized in a presentation to the National Academies of Sciences[88]:

- Physical security provides early detection and assessment of unauthorized access or activities by an external adversary to special nuclear material (SNM) and provides an appropriate response. MC&A serves to deter and detect any loss, theft, or diversion of SNM for unauthorized use. Both sets of regulations take a graded approach, based on the quantity and type of SNM possessed.
- More rigorous requirements apply at higher enrichment levels (e.g., HALEU) and for MC&A, to facilities that process unencapsulated SNM (e.g., fuel cycle facilities).[89]
- NRC can use site-specific license conditions, as needed, to ensure security and safeguards requirements are fairly and reasonably applied.
- Commercial fuel cycle facilities for advanced reactors would be subject to international safeguards in accordance with the U.S.-IAEA Safeguards Agreements. These may include reporting of SNM transactions and inventory, providing design information, and possible design verification visits by IAEA.
- The NRC export and import licensing process includes review and consultation with DOE-NNSA and other Executive agencies to ensure appropriate controls on nuclear equipment, components, and material. The same controls apply to the advanced reactor fuel cycle.
- NRC also works closely with interagency and international groups to support U.S. nonproliferation objectives.

The NRC continues to leverage the agency's current experience (e.g., in licensing the fabrication of Naval and Research and Test Reactor fuel and certifying transportation packages for tri-structural isotropic particle fuel (TRISO fuel)) to ensure the safe fabrication and transportation and storage of advanced reactor fuels.[90] Additionally, it continues to coordinate internally and with other agencies – including DOE and the national laboratories – to acquire new insights, develop technical data, and assess industry approaches. It is also actively reviewing license applications

069-6 (cont'd)

[87] Key relevant NRC regulations include 10 CFR Part 70 (Domestic licensing of special nuclear material), 10 CFR Part 71 (Packaging and transportation of radioactive material), 10 CFR Part 73 (Physical protection of plants and materials), 10 CFR Part 74 (Material control and accounting of special nuclear material), 10 CFR Part 75 (International safeguards), 10 CFR Part 95 (Facility security clearance and safeguarding of national security information and restricted data), and 10 CFR Part 110 (Export and import of nuclear equipment and material).

[88] NRC, *Overview of the NRC's Regulatory Programs on the Advanced Reactor Fuel Cycle* (Sept. 23, 2020), https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML20267A090.

[89] As the DEIS notes, NRC-licensed facilities that possess U-235 that is enriched between 10% but less than 20%, within the range of enrichment defined as HALEU, would fall under the Category II requirements in 10 CFR 73.67. DEIS at 1-6. *See also* NRC, *Fuel Cycle - Physical Security Requirements for Facilities With Category II Quantities of Special Nuclear Material – Informational Sheet*, https://www.nrc.gov/reactors/new-reactors/advanced/modernizing/rulemaking-and-guidance/fuel-cycle.html.

[90] NRC, "High-Assay Low-Enriched Uranium (HALEU)," https://www.nrc.gov/materials/new-fuels/haleu.html.

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for the enrichment, fabrication, and transportation of HALEU fuel.[91] These activities have led the NRC to conclude that its risk-informed and performance-based regulatory framework for licensing and oversight is sufficiently flexible "to ensure the safe and secure operation of the complete fuel cycle for advanced reactors."[92]

069-6 (cont'd)

VI. The DEIS's Discussion of Reasonably Foreseeable "Post-Proposed Action Activities" Is Sufficient Under NEPA Given the Type and Level of Information Currently Available

In addition to the numerous activities needed to facilitate the commercialization of HALEU fuel production and acquisition of up to 290 MT of HALEU, the DEIS also discusses, to the extent practicable, what DOE describes as three "reasonably foreseeable activities that could result from implementation of the Proposed Action."[93] Those activities include:

- Fuel fabrication for a variety of fuel types in an NRC Category II facility;
- HALEU-fueled reactor (demonstration/test, power, isotope production) operations; and
- Spent fuel storage and disposition.

As DOE notes, additional discussion of these particular activities is not warranted at this time given the need for information that is contingent upon future commercial and regulatory decisions that lie outside the scope of Proposed Action activities. For example, advanced reactor fuel requirements will depend on the specific reactor designs licensed by the NRC and the extent to which those designs are deployed. Those future developments, in turn, will determine the types and numbers of fuel fabrication facilities required and the ultimate disposition of HALEU-related spent nuclear fuel. Further, any HALEU fuel fabrication facilities, commercial HALEU-fueled advanced reactors, and spent fuel storage and disposition activities will be licensed by the NRC and subject to additional, detailed site-specific NEPA evaluations.[94]

069-7

Nonetheless, DOE has clearly met its NEPA obligations relative to the three activities identified above (in addition to those activities constituting the HALEU supply chain) by **independently reviewing and assessing** NEPA evaluations prepared by the NRC and other relevant documentation. The DEIS authors, who are subject matter experts in their respective fields, used their education, working knowledge, experience, and professional judgment to evaluate the existing NEPA evaluations and extrapolate the potential environmental consequences associated

[91] *See* SECY-24-0020, *Advanced Reactor Program Status* (Feb. 27, 2024), https://www.nrc.gov/docs/ML2335/ML23350A002.html.

[92] NRC, *Overview of the NRC's Regulatory Programs on the Advanced Reactor Fuel Cycle* (Sept. 23, 2020), https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML20267A090. *See also* NRC, *Preparedness for High Assay Low Enriched Uranium Availability – A Report to the Senate Committee on Appropriations and the House Committee on Appropriations*, https://www.nrc.gov/docs/ML2132/ML21323A151.pdf.

[93] DEIS, Vol. 1 at 1-17, 2-2.

[94] *Id.* at 1-17, 2-2.

069-6 (cont'd)

069-7 (cont'd)

069-7 DOE acknowledges your support for the analytical approach in the HALEU EIS and the list of additional resources provided, thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information. DOE concurs that reasonably foreseeable actions, to include reactor technologies are dependent upon decisions outside of the Proposed Action activities. The extent to which these actions happen and if so, where they would happen is unknown and highly speculative. Therefore, detailed assessment of their total impacts is not possible at this time. These activities are described in more detail in Section 2.1.7.1, "HALEU Fuel Fabrication Facilities"; Section 2.1.7.2, "HALEU-Fueled Reactors"; and Section 2.1.7.3, "HALEU Spent Nuclear Storage and Disposition," of Volume 1 of the Final EIS.

Commenter No. 69 (cont'd): Martin O'Neill, Nuclear Energy Institute

NEI Comments on DOE's Draft HALEU EIS (DOE/EIS-0559)
April 22, 2024

with the Proposed Action and post-Proposed Action.[95] This approach is consistent with NEPA.[96] DOE's extensive evaluation of those materials is documented in Appendix A (Environmental Consequences Supporting Information), Appendix B (Facility NEPA Documentation), and a 546-page contractor-prepared technical report that is referenced in the DEIS and is publicly available.[97] The following sections of Appendices A are relevant to the three reasonably foreseeable activities listed above:

- A.7.1 – HALEU Fuel Fabrication
- A.7.2 – Construction and Operation of Reactors
- A.7.3 – Spent Nuclear Fuel Storage and Disposition

Appendix B, which provides the supporting information for Table 1.0-1 of the DEIS, discusses the extent of current NEPA coverage available for each activity. It also lists the various reference materials by activity and existing facility location. Appendices A and B indicate that DOE carefully evaluated numerous documents, including, among many others, the NRC's NEPA review documents for the Framatome, GNF-A, Westinghouse, and BWXT fuel fabrication facilities, the applicant's Environmental Report for the proposed TRISO-X fuel fabrication facility (which is undergoing NRC licensing review), the NRC's *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (NUREG-2157), and the NRC's *Draft Generic Environmental Impact Statement [GEIS] for Advanced Nuclear Reactors [ANRs]* (NUREG-2249).[98]

Notably, Section 3.14.2 (Fuel Cycle Impacts) of the NRC's draft ANR GEIS evaluates the nuclear fuel cycle impacts of light-water reactor (LWR) and non-LWR fuels (including HALEU) based on expected fuel forms. Based on its current understanding of proposed plans and designs for the activities associated with ANR fuel and facilities, the NRC staff examined available information about uranium extraction, uranium conversion, uranium enrichment, fuel processing/fabrication, nuclear material transportation, irradiated fuel processing, spent fuel management, and radioactive waste management as it relates to expected ANR systems. The ANR GEIS concludes that "ANR fuel cycles will have SMALL environmental impacts (i.e., impacts that are less than or comparable to those of current LWRs and those discussed in Table S-3 [of 10 CFR 51.51]), particularly for once-through fuel cycle options." The ANR GEIS attributes the lower fuel cycle

069-7 (cont'd)

[95] DEIS, Vol. 2, App. A at A-1.

[96] *See*, *e.g.*, *Stop the Pipeline v. White*, 233 F. Supp. 2d 957, 967–68 (S.D. Ohio 2002) ("An agency may fulfill its obligations under NEPA to conduct an independent evaluation of environmental impacts by reviewing and relying on information, data, and conclusions supplied by other federal or state agencies."); *Hoosier Env. Council v. U.S. Army Corps of Eng'rs*, 722 F.3d 1053, 1061 (7th Cir. 2013) ("If another agency has conducted a responsible analysis, the Corps can rely on it in making its own decisions.").

[97] *See Technical Report in Support of the Environmental Impact Statement for DOE Activities in Support of Commercialization of High-Assay Low-Enriched Uranium Fuel Production,* prepared by Leidos for U.S. DOE Idaho Operations (available for download at https://www.leidoseemg.com/haleuEIS.references/#v2Areferences).

[98] On April 17, 2024, the Commission issued Staff Requirements Memorandum (SRM)-SECY-21-0098 (https://www.nrc.gov/docs/ML2410/ML24108A199.html), approving the NRC staff's recommendation to publish in the *Federal Register* for public comment a proposed rule that would amend 10 CFR Part 51 to codify the findings of the draft ANR GEIS.

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impacts to improved fuel cycle technologies, improved reactor technologies, and waste and spent fuel inventories that are not significantly different from what has been considered for LWR evaluations (e.g., as in the Continued Storage Rulemaking) with respect to radionuclides. This conclusion appears to be generally consistent with that reached by DOE in the DEIS.

It bears emphasis that the NRC's, DOE's, and broader scientific community's understanding of HALEU-related technical and environmental issues continues to evolve and expand through ongoing research and development programs, technical studies, generic regulatory initiatives, and specific licensing actions (both during the pre-application and application review stages). Some additional programs, projects, and documents that may be of interest to DOE as it finalizes the HALEU EIS include, but are not limited to, the following:

- ***SECY-24-0020, Advanced Reactor Program Status* (Feb. 27, 2024)** (https://www.nrc.gov/docs/ML2335/ML23350A002.html): This document (including its enclosure) provides the NRC's annual update on activities to license and regulate the civilian use of advanced reactor technology, including non-LWRs and light-water small modular reactors (SMRs). The paper describes progress made during calendar year 2023 on the NRC's advanced reactor licensing and readiness activities, including activities and licensing actions related to the advanced reactor fuel cycle.
- ***Fuel Qualification for Advanced Reactors, Final Report (NUREG-2246)* (Mar. 2022)** (https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2246/index.html): This NRC report examines the regulatory basis and related guidance applicable to fuel qualification, and identifies criteria that will be useful for advanced reactor designers through an assessment framework that would support regulatory findings associated with nuclear fuel qualification.
- ***Environmental Evaluation of Accident Tolerant Fuels [ATF] with Increased Enrichment and Higher Burnup Levels – Draft Report for Comment (NUREG-2266)* (Aug. 2023)** (https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2266/index.html): This study concludes that Table S-3 and Table S-4 in the *Continued Storage Generic Environmental Impact Statement*, and the *Decommissioning Generic Environmental Impact Statement* would bound the deployment of near-term ATF for up to 8 wt% U-235 and up to 80 GWd/MTU. It also indicates that there would be no significant adverse environmental impacts for the uranium fuel cycle, transportation of fuel and wastes, and decommissioning associated with deploying near-term ATF with enrichments up to 8 wt% U-235 and peak-rod burnups up to 80 GWd/MTU.
- ***Optimizing Nuclear Waste and Advanced Reactor [AR] Disposal Systems (ONWARDS) Project*, *Advanced Research Projects Agency-Energy (ARPA-E)*** (https://arpa-e.energy.gov/technologies/programs/onwards): This ARPA-E project comprises 11 individual projects "[t]o enable the growth of advanced nuclear energy," and "to develop and demonstrate breakthrough technologies that will facilitate a 10x reduction in AR waste volume generation or repository footprint." In addition, ONWARDS "aims to advance development of high-performance AR waste forms while maintaining exemplary

069-7 (cont'd)

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Commenter No. 69 (cont'd): Martin O'Neill, Nuclear Energy Institute

safeguards standards and global back-end costs in the accepted range of $1/megawatt-hour."

- ***Nuclear Waste Attributes of SMRs Scheduled for Near-Term Deployment – Nuclear Fuel Cycle and Supply Chain (ANL/NSE-22/98, Revision 1)* (Nov. 18, 2022)** (https://doi.org/10.2172/1900154): This study focuses on nuclear waste attributes of three SMRs scheduled for near-term-deployment: VOYGR™ (NuScale), Natrium™ (TerraPower), and Xe-100 (X-energy). It compares those wastes to those of a reference large PWR, examining front-end wastes (e.g., fuel manufacture), back-end waste (e.g., spent fuel management), and end-of-life or decommissioning wastes. The study finds that waste attributes of the SMRs show both "similarities to the reference LWR and some potentially significant differences." Overall, the study concludes that "assuming appropriate waste management system design and operational optimization, there appear to be no major challenges to the management of SMR wastes compared to the reference LWR."
- ***NRC Research Activities in Spent Fuel Storage and Management of Advanced Fuels for Advanced* Reactors (Mar. 2024)** (NRC ADAMS Accession Number ML24081A122): This paper, prepared for the forthcoming IAEA "International Conference on the Management of Spent Fuel from Nuclear Power Reactors: Meeting the Moment" to be held from June 10-14, 2024, Vienna, Austria, describes research activities and recently completed reports aimed at expanding the NRC's understanding of the key technical and regulatory considerations associated with the storage and transportation of advanced non-LWR reactor spent fuel types.
- ***Back-End Management of Advanced Reactors (BEMAR)*,** Presentation Slides of Jorge Narvaez, DOE Office of Integrated Waste Management, NRC's 36th Annual Regulatory Information Conference, Rockville, Maryland (Mar. 12, 2024), https://ric.nrc.gov/agenda/agenda-presentation.aspx?SessionSpID=17.
- ***Back-End Management of Advanced Reactors (BEMAR)***, Presentation Slides of Ned Larson, DOE, Nuclear Waste Technical Review Board Summer 2023 Meeting, Idaho Falls, Idaho (Aug. 30, 2023), https://www.nwtrb.gov/docs/default-source/meetings/2023/august/ned-larson.pdf?sfvrsn=4.

The technical information and insights acquired from the foregoing studies, projects, and programs, among others, likely will inform future NEPA evaluations for site-specific facilities that result from implementation of the Proposed Action.

069-7 (cont'd)

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Commenter No. 70: Joanne Morrow

From: Joanne Morrow
To: HALEU-EIS
Subject: [EXTERNAL] No Nukes in Montana!
Date: Monday, April 22, 2024 10:36:31 PM

My name is Joanne Morrow and Montana is my home. I am strongly opposed to the development of nuclear power due to safety concerns and lack of any permanent, safe way to store nuclear waste. *070-1* *070-2, 3*

I encourage you to put your efforts toward safe, clean, and sustainable forms of energy generation, such as wind and solar, rather than nuclear. *070-4*

Thank you for your time,

Joanne Morrow
[redacted]

Sent from my iPhone

****
This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.

****

070-1 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

070-2 The HALEU EIS evaluates the safety of nuclear fuel cycle facilities that would be required by the Proposed Action as well as the safety of reasonably foreseeable activities related to using HALEU by considering the impact of normal operation and accidents. In its analysis, DOE considered occupational risks under normal operations, and radioactive and hazardous material releases under both normal operations and accident scenarios. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents. The analyses includes assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. These impacts, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos Technical Report (Leidos, 2023), are summarized in Appendix A, Tables A-1 through A-4 and A-6 through A-10 of the HALEU EIS. To the extent possible, transportation issues associated with production and storage of HALEU are addressed in the HALEU EIS (See Sections S.7.1.6, 2.1.6, and 3.6 of the EIS) and supported by the Section 6 analysis in the Leidos Technical Report (Leidos, 2023). Many requirements, such as those pertaining to site evaluation, design, construction, commissioning, operation, and preparation for decommissioning of facilities, exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. Further, as part of the licensing process for nuclear facilities, DOE expects that the relevant regulatory authority would analyze a comprehensive set of accident sequences and the likelihood and consequences of these accidents to assure safety of the public and workers. DOE also expects that intentional destructive acts (e.g., terroristic acts, sabotage) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion please refer to Sections 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal;" and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

070-3 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3,

Commenter No. 70 (cont'd): Joanne Morro

HALEU Spent Nuclear Fuel Storage and Disposition, HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

070-4 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the

Commenter No. 70 (cont'd): Joanne Morro

HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Even with the timeline the commenter identified, nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

Commenter No. 71: Sarah Fields, Uranium Watch

From: Sarah Fields
To: HALEU-EIS
Subject: [EXTERNAL] Comments: EIS for HALEU,- 89 Fed. Reg. 16546; March 7, 2024
Date: Monday, April 22, 2024 10:21:44 PM
Attachments: UW_DOE_HALEU_DEIS_89FR16546_Comments_042224.pdf

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235,
Idaho Falls, Idaho 83415

Re: Environmental Impact Statement for High-Assay Low-Enriched Uranium (HALEU) Availability Program Activities in
Support of Commercial Production of HALEU Fuel. 89 Fed. Reg. 16546; March 7, 2024

Dear Mr. Lovejoy:

Attached please find comments on the Draft Environmental Impact Statement (DEIS) for High-Assay Low-Enriched
Uranium (HALEU) Availability Program Activities in Support of Commercial Production of HALEU Fuel.

Please acknowledge the receipt of these comments.

Sincerely,

Sarah Fields
Program Director
Uranium Watch
P.O. Box 1112
Moab, Utah 84532
435-260-8384

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Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

Uranium Watch

P.O. Box 1112
Moab, Utah 84532
435-260-8384

April 22, 2024

via electronic mail

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235,
Idaho Falls, Idaho 83415
HALEU-EIS@nuclear.energy.gov

Re: Environmental Impact Statement for High-Assay Low-Enriched Uranium (HALEU) Availability Program Activities in Support of Commercial Production of HALEU Fuel. 89 Fed. Reg. 16546; March 7, 2024

Dear Mr. Lovejoy:

Below please find comments on the Draft Environmental Impact Statement (DEIS) for High-Assay Low-Enriched Uranium (HALEU) Availability Program Activities in Support of Commercial Production of HALEU Fuel.

Uranium Watch is a public interest 501(c)(3) non-profit organization under the fiscal sponsorship of Living Rivers. Uranium Watch focuses on the health, safety, and environmental impacts of uranium mining and milling and related nuclear industry projects.

1. General Comments

1.1. Preferred Alternative: The DOE only provides two alternatives: the Preferred Alternative and No Action Alternative.

Comment: Uranium Watch does not support the Preferred Alternative. Uranium Watch does not support the federal government procurement from commercial sources of HALEU enriched to at least 19.75 and less than 20 weight percent uranium-235 over a10-year period of performance and the establishment of commercial HALEU fuel production.

071-1

071-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see discussion in Section 1.1 of the EIS for further information on the estimated projections for needed HALEU and the need for DOE intervention which informs DOE's Proposed Action and description of the No Action Alternative. DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

Uranium Watch supports the No Action Alternative. The DOE characterization of the two alternatives is misleading. It is not a given that if United States tax dollars are not spent to support the development of HALEU that the U.S. nuclear industry would remain reliant on foreign supplies of HALEU and there would be no commercial development of HALEU in the U.S.

071-1 (cont'd)

1.2. HALEU Fuel Cycle Facilities

COMMENT:
The EIS should include the NRC docket numbers and links to NRC web pages for the currently licensed fuel cycle facilities and those undergoing pre-application engagement with the NRC. Also, the DOE should review the links to websites and NRC documents provided in the DEIS. There is at least one link that no longer works.

071-2

1.3. Uranium Watch's comments focus on conventional uranium mining and milling, because that is what we know about. There are probably similar DEIS issues related to its analysis of other licensed or anticipated nuclear fuel cycle operations necessary to produce HALEU.

2. Draft EIS, Summary

2.1. Proposed Action Overview (Readers Guide page 1)
This section (page 1) states that "a sizable body of information already exists that evaluates the potential environmental consequences of those activities. In this EIS, DOE used that existing information to estimate potential environmental impacts associated with the Proposed Action to acquire HALEU." It also states (page 2): "The activities performed under DOE's Proposed Action, if implemented, have a long history of being conducted safely and none are unique to the production of HALEU, having been conducted for other uranium forms and improved over many decades. Extensive environmental analyses have been completed for facilities that perform uranium mining and milling, conversion, enrichment, deconversion, storage, and transportation activities, as well as fuel fabrication, use of uranium fuel in reactors, and spent nuclear fuel management."

COMMENT:
I live in a community and area of southeast Utah where there is a $1 billion tax-payer funded DOE uranium mill tailings removal project; several permitted uranium mines; one uranium mine that emits radon within a quarter of a mile of an elementary school; hundreds of abandoned uranium mines related to the U.S. Atomic Weapons Program and commercial fuel production; uranium mill tailings leaching uranium and other contaminants into ground and surface water because the tailings impoundments were not lined; flooded mine workings that are not being monitored for off-site migration of contaminated mine water; mine and mill workers who were sickened or died from exposure to uranium, radon, and other uranium progeny during mine exploration, uranium mining, ore transportation, uranium milling, and proximity to mine workers in

071-3

071-2 The references that were used in the preparation of the EIS are provided in Chapter 9 of the Final EIS and section A.9 of Appendix A (Volume 2 of the HALEU EIS. Additional source material references can be found in the Leidos Technical Report (Leidos, 2023). Lists of the NEPA documents for facilities that were reviewed for the EIS are included in Volume 2, Appendix A subsections 2.2 (e.g., mining and milling documents are listed in Section A.1.2.2) for each of the HALEU fuel cycle activities in sections depending on the activity (e.g., Section A.1.2.2 for Mining and Milling) of Volume 2 of the Final EIS. This information is also available in sections depending on the activity (e.g., 1.1.4 for Mining and Milling) in the Technical Report (Leidos, 2023). NRC docket numbers were not included, the dockets would include information which is not relevant to or used in the preparation of the EIS. The EIS represents a "snapshot" in time and does not represent a living document that would reflect future revisions or additions to a NRC docket. Thank you for identifying the inactive link. All links went through another round of testing before the Final EIS was issued to ensure they were working.

071-3 DOE acknowledges that legacy contamination has occurred from past uranium recovery and enrichment activities and the commenter's concerns. Please see Section 2.4, "Legacy Issues," of the CRD andthe responses to Comments 056-1 and 056-23 for further information about the EIS' analytical approach, legacy issues and potential water impacts from mining and milling.

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

the family and to areas contaminated by uranium and uranium progeny. In the Four-Corners region (Arizona, Colorado, New Mexico, and Utah) there are many millions of gallons of groundwater that have been contaminated by uranium mills and mines.

071-3 (cont'd)

The information on environmental impacts included in this DEIS are a limited body of information and do not in any manner reflect past, current, or potential environmental impacts from uranium mining and milling that would be expected from the production of new types of nuclear fuel.

The statement that "the activities performed under DOE's Proposed Action, if implemented, have a long history of being conducted safely" is false and misleading and not supported by the long history of adverse impacts from uranium mining and milling, both short and long-term. These include impacts to the health and well being of workers, their families, and nearby communities; ground and surface water; land; domestic animals and wildlife; local economies; cultural resources, including kivas, pit houses, burial sites, and traditional ceremonial sites; plants and herbs; loss of control over ones land, life, and destiny; and numerous other short and long-term impacts from the historic, current, and future development and operation of this unfortunate industry.

071-4

2.2. Section S.7.1.1 Uranium Mining and Milling (page 12)

COMMENT:

The DOE should provide two separate sections in the EIS related to uranium mining and uranium recovery (uranium milling, heap leach, and in situ leach (ISL) uranium recovery. Uranium milling, heap leach, and ISL uranium recovery operations are regulated under the Atomic Energy Act (AEA) and Nuclear Regulatory Commission (NRC) or NRC Agreement State, and Environmental Protection Agency (EPA) regulations. These uranium recovery operations recover uranium and/or thorium from ore. Some of the environmental impacts from uranium recovery are different from those of uranium mining and they have different regulatory and environmental impact histories. They should be treated separately in the EIS.

Uranium mining is the process of removing uranium and/or thorium ore and processing that ore at a licensed uranium and/or thorium mill. Uranium mining takes place at the source of the ore and is not regulated under the Atomic Energy Act. Uranium mining often occurs on lands administered by the Bureau of Land Management or U.S. Forest Service. The mining falls under the applicable federal agency's hard rock mining regulations, since those agencies do not have regulations specific to uranium mining. Also, the DOE has a Uranium Leasing Program. Uranium mines on private, state and tribal lands are regulated by state mining regulatory agencies. Some states—for example, Colorado, New Mexico, and Utah—also regulate hard rock mining on federal lands.

071-5

2.3. Section S.7.1.1 Uranium Mining and Milling (page 12)

This section states: "Currently, very little uranium is mined in the United States; about 8 MT were mined in 2020, down from 227 MT in 2018 (Nuclear Energy Agency and International Atomic Energy Agency, 2023, p. 75 Table 1.17).

071-6

071-4 Although DOE does not agree with the commentor's statement that the quoted language is false, to avoid any misunderstanding, DOE has removed the sentence from the EIS. In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. These releases all had the potential to impact the resources the commenter identified (domestic animals and wildlife; local economies; cultural resources,and other short and long-term impacts). While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD.

071-5 The EIS is structured to document the uranium fuel cycle facilities used in the uranium fuel cycle. The initial step in the production of HALEU is the extraction and recovery of uranium ore into "yellowcake." As discussed within the EIS and the Technical Report, the EIS considers two uranium mining extraction methods: (1) in-situ recovery (ISR) mining, which is the predominant extraction method currently used in the United States for uranium recovery, and (2) conventional mining, which includes open-pit and underground mining. Within the Technical Report there are individual subsections for each of these uranium recovery activities. For ISR mining, the uranium ore is oxidized from insoluble tetravalent uranium to highly soluble hexavalent uranium (U3O8) and is further processed at on on-site central processing plant, which uses ion exchange to extract the uranium ions from the liquid and subsequently produces yellowcake. For conventional mining, yellowcake is not produced on-site, rather this mining method requires the ore be transported to a mill where it is crushed and processed to concentrate the uranium. Although the EIS considers mining and milling as a single step in the production of HALEU to obtain the yellowcake, the Technical Report (Leidos, 2023) does consider three separate activities ISR mining, Conventional Mining, and Milling. Please refer to Section 1.3 of the Technical Report for further information on potential impacts by resource. When impacts differed between the three activities, the differences

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

COMMENT:

This is not up-to-date and is very misleading information. The DOE fails to mention the increase in the price of uranium, which will result in new uranium production.

The DOE should rely on current information related to the uranium mining and milling. Currently, the only operating uranium mill is the White Mesa Uranium Mill, San Juan County, Utah. The Mill is owned and operated by Energy Fuels Resources (USA) Inc. (EFRI) the U.S. subsidiary of Energy Fuels, Inc., a Canadian company. Recently, EFRI commenced the removal or ore from the Pinyon Plain Mine, Coconino County, Arizona, close to the south rim of the Grand Canyon. EFRI has restarted mining at the La Sal and Pandora Mines, part of the La Sal Mines Complex, San Juan County, Utah. EFRI has also resumed development of the Whirlwind Mine, Mesa County, Colorado. The company also processes uranium bearing wastes from other mineral processing operations and uranium and rare earth bearing monazite ore. EFRI also has stockpiles of yellowcake and partially processed uranium. The DOE should incorporate information from EFI News Releases[1] and filings to the U.S. Securities and Exchange Commission and Canadian Securities Administrators.[2]

Western Uranium and Vanadium Corp. has announced its intention to construct a uranium mill at Green River, Utah, and has acquired land from the Utah Institutional Trust Lands Administration for such a project.[3] Anfield Resources recently submitted a License Renewal Application for the reopening of the Shootaring Canyon Uranium Mill in Garfield County, Utah, to the DWMRC.[4] There are several companies that are carrying out, or have proposed, uranium exploration drilling. Many new mining claims have been filed. Some of this exploration activity is very speculative and meant to drive up share prices and investment and will not lead to uranium ore production.

In sum, the DOE should provide a full and accurate assessment of uranium mining and milling and current production and stockpiles of uranium ore, uranium bearing wastes yet to be processed, yellowcake, partially processed uranium, and uranium hexafluoride.

071-6 (cont'd)

2.4. Section S.7.1.1 Uranium Mining and Milling, Figure S.7-1 (page 13)

COMMENT:

Figure S.7-1. Uranium Mines in the United States, is a map that is supposed to show counties with uranium mining and milling and ISL uranium production. The map shows state and county locations of ISR Mining, Conventional Mining, and

071-6 (cont'd)

[1] ERI: <https://www.energyfuels.com/news-releases>

[2] SEDAR:<https://www.sedarplus.ca/landingpage/>

[3] Western Uranium and Vanadium Corp. News Releases 2023: <https://www.western-uranium.com/news-2023.html>

[4] Anfield Energy News Releases: <https://anfieldenergy.com/category/2024/>

were noted in Section 3.1 and then summarized in Section 2.6.1. Regarding site-specific examples, this EIS does not analyze site-specific locations or processes/technologies that may be employed by the commercial suppliers. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). To the extent possible, cumulative impacts are addressed in Chapter 4 of the HALEU EIS. However, because this EIS does not analyze site-specific locations, a site specific impact analysis is not possible. Therefore, cumulative impacts affecting only the location of a HALEU fuel cycle activity is not possible. DOE did include a discussion of legacy impacts in Appendix A (Section A.1.3.12) and see Section 2.4, "Legacy Issues," of this CRD.

071-6 DOE reviewed numerous available sources, including NRC databases, regarding the location of existing permitting mines and mines on standby. Some of these locations are currently undergoing NRC review for reopening. The EIS has been updated. See Section 3.1 in Volume 1 and Section A.1 in Volume 2 which include statements on the recent uranium producers' activities affecting uranium mining in the United States. The scope of the EIS does not include site-specific analysis or processes/technologies that may be employed by the commercial suppliers, rather it assesses the range of impacts associated with the Proposed Action activities. Figure 2.1-1 has been updated to reflect additional mining sites considered based on public comments, this includes identification of the Pinyon Plain mine in Coconino County and Whirlwind mine in Mesa County/Grand County and the Sunday Mine in San Miguel County. Regarding the operation status of uranium mining in McKinley, Mohave, Montrose counties, the figure includes all permitted mines identified, regardless of their status (operation, standby, etc.). Regarding locations of uranium mills, DOE reviewed numerous available sources, including NRC databases. Figure 2.1-1 has been updated to include the Shootaring Mill, which is planned to be restarted and the proposed Green River Mill in Utah. The commenter is referred to the response comments 056-6, 056-8, 056-11, and 056-21 through 056-23 for additional information. The Technical Report (Leidos, 2023) contains additional information regarding mining and milling including the general layout of a conventional mining site and more details on milling operations and an assessment of impacts based on information contained in the referenced documentation. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report.

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

Milling Facilities. First, in situ leaching is a uranium recovery operation regulated under the AEA and NRC regulations applicable to other uranium recovery facilities (conventional mills and heap leach operations) at 10 C.F.R. Part 40. Uranium mining is not regulated under the AEA or NRC regulations. So, it is confusing to call ISL (or ISR) operations "mining."

The map shows Milling Facilities in Garfield County, Utah. The only uranium mill in Garfield County is the Shootaring Canyon Mill, which has not operated since 1982 and is currently not licensed to operate.[5] The White Mesa Uranium Mill, the only conventional uranium mill in the U.S. that is licensed to operate, is in San Juan County, Utah.[6]

The map shows uranium mining in Mohave County, Arizona. There is currently no uranium mining in Mohave County, though there is a mine on standby, which has not operated for about 10 years. The map does not show uranium mining in Coconino County, Arizona, the location of EFRI's Pinyon Plain Mine, which is currently operating. The map does not show uranium mining in Mesa County, Colorado, the location of the Whirlwind Mine. Also, much of the underground workings of the Whirlwind Mine are in nearby Grand County, Utah, The Sunday Mine Complex is located in San Miguel County, Colorado. I do not believe there is an active, permitted uranium mine in Montrose County, Colorado. There is no developed, operational in situ leach uranium recovery operation in McKinley County, New Mexico. The DOE should verify the permitted and operational ISL operations with the State of Wyoming and the NRC.[7] Some operations have been on standby for lengthy periods of non-operation or have commenced reclamation.

071-6 (cont'd)

2.5. Section S.7.1.1 Uranium Mining and Milling, Figure S.7-2 An In-Situ Recovery Operation (page 13)

Comment: Figure S.7-2, An In-Situ Recovery Operation, is a diagram of an ISL operation. The DOE should also have provided diagrams of a conventional uranium mine and a conventional uranium mill. Also, diagrams should include the various types of emissions and wastes from these types of uranium operations.

2.6. HALEU Spent Nuclear Fuel Storage and Disposition (page 20)

COMMENT:

The DEIS discusses spent fuel storage and ultimate long-term storage and monitoring. The DEIS should also discuss the design, licensing, and use of dry casks for

071-7

[5] DWMRC: <https://deq.utah.gov/businesses-facilities/anfield-resources-holding-corp>

[6] DWMRC: <https://deq.utah.gov/businesses-facilities/energy-fuels-resources-usa-inc>

[7] NRC: <https://www.nrc.gov/info-finder/materials/uranium/index.html#licensed-facilities>

071-7 SNF has a long history of being safely managed and that management is subject to extensive regulatory requirements. These requirements address packaging, transportation, and interim storage. The characteristics of the various potential HALEU fuel assembles and therefore the associated characteristics needed for analytical evaluations cannot be known at this time and not ripe for any NEPA evaluations. When a HALEU fuel assembly design is prepared, the cognizant regulatory authority will perform the NEPA evaluation as part of the licensing and permitting processes. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A,

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the storage and transportation of HALEU. The DEIS should discuss the research that has been done and will be done to evaluate 1) the long-term behavior of HALEU in spent fuel pools and 2) the long term behavior of HALEU spent fuel rods in temporary dry cask storage, transportation, and permanent long-term spent fuel storage. The DOE must analyze the potential behavior of spent HALEU fuel rods under all and any conditions related to temporary and long term storage and transportation.

071-7 (cont'd)

2.7. NRC Reactor Proposals

COMMENT:
The DEIS should list the various pre-application and application engagements with the NRC for reactors that the DOE expects would use HALEU. The DOE should evaluate the licensing and operation of these proposals using HALEU and conventional uranium fuels if HALEU is not available.

071-8

3. Section S.10 Summary of Environmental Consequences.

3.1. Section S.10.1 Summary and Comparison of Alternatives (page 21)
This section states: "This EIS describes the potential environmental consequences associated with implementation of the Proposed Action. The presentation of potential environmental consequences in this document summarizes and incorporates by reference the findings contained in previously issued NEPA evaluation documents."

COMMENT:
A review of the NEPA documents reviewed by the DOE shows that there are impacts from uranium mines and mills, including cumulative impacts that have not been considered by the DOE. There are impacts that the DOE has not considered, because the DOE did not hold any public meetings in the vicinity of uranium mining and milling operations to obtain first-hand information about those operations and impacts.

071-9

3.2. Table S.10-1. Summary of Impacts (page 25)
This table addresses Uranium Mining and Milling.

COMMENT:
As stated above, the DOE should separately evaluate the impacts from uranium mining from the impacts from uranium recovery, and separate impacts from conventional milling, heap leach, and ISL operations, which have different types of significant impacts. In this section, the DOE should specifically identify the operations that it is including in their evaluation. The DOE must include cumulative impacts from earlier uranium mining and milling operations. Since the specific facilities and locations are not included in this section of the DEIS, it is hard to understand the specific impacts from a specific location or facility that are being taken into consideration by the DOE.

071-5 (cont'd)

4. Draft Environmental Impact Statement, Volume I

4.1. Table 1.0-1. NEPA Status for Potential HALEU Fuel Cycle Facilities (page 1-11).

Environmental Consequences Supporting Information. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

071-8 The NRC licensing status of several advanced nuclear reactors is shown in Section 8.1.3, Table 8-1, of the Technical Report (Leidos, 2023) that supports the HALEU EIS. In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. The subject of using "conventional uranium fuels" would not meet the purpose and need and is out of scope for the HALEU EIS.

071-9 As stated in the HALEU EIS, this EIS does not propose selection of specific sites for HALEU fuel cycle facilities. DOE acknowledges the occurrence of legacy contamination and potential for this type of contamination to contribute to site-specific cumulative impacts. Please see Section 2.4, "Legacy Issues," of the CRD for additional information. Regarding analysis of impacts, please see the response to Comment 056-1 for additional information on DOE's analysis of impacts. Please also refer to Section 3.1, "Uranium Mining and Milling" in Vol. 1 of the Final EIS and Section 1.3, "Affected Environment and Environmental Consequences," of the Technical Report for further information on potential mining and milling impacts by resource. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include assessments at specific locations. During both the scoping and public comment period, DOE identified physical and digital newspaper outlets with proximity to commercial enrichment, conversion, deconversion, and fuel fabrication sites to distribute information about upcoming meetings and comment mechanisms. These locations included Illinois, Ohio, North Carolina, Idaho, Tennessee, Virginia, and Nebraska. Notices were also distributed to states historically impacted by uranium mining and milling, which included state-wide coverage in Wyoming, Texas, Arizona, New Mexico, Colorado, and Utah. During the

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COMMENT:

Table 1.0-1 provides incomplete information regarding environmental reviews of facilities that would provide uranium for the HALEU program. The Table provides a list of NRC Licensed Facilities and their NEPA status. Missing from the List are Uranium Mills that are licensed by the NRC or an NRC Agreement State. The DOE left off the White Mesa Uranium Mill, which was originally licensed by the NRC and is now regulated by the State of Utah, under NRC oversight.

Also, there is no mention of uranium mines that would provide ore to conventional uranium mills. Some of the currently operating uranium mines have undergone a federal NEPA review, though sometimes outdated (Pinyon Plain Mine) and sometimes only an Environmental Assessment (La Sal Mines Complex) was issued. The Bureau of Land Management intends to issue a Draft Environmental Impact Statement for the Sunday Mine Complex in San Miguel County, Colorado, for public comment.[8]

4.2. Section 2.1.1 Uranium Mining and Milling, Figure 2.1-1. Uranium Mines in the United States (page 2-3)

The DEIS states: "In the United States, portions of the uranium mining and recovery process are regulated by different agencies. As described on the NRC website, the regulatory responsibility depends on the extraction method that the given facility uses (NRC, 2023a). Specifically, conventional mining (where uranium ore is removed from deep underground shafts or shallow open pits) is regulated by the U.S. Department of the Interior, Office of Surface Mining, and the individual states where the mines are located."

COMMENTt:

As discussed above, Figure 2.1-1, the map of uranium mines in the U.S., needs some correction. Also, the text is also misleading. The text states: "conventional mining (where uranium ore is removed from deep underground shafts or shallow open pits) is regulated by the U.S. Department of the Interior, Office of Surface Mining, and the individual states where the mines are located."

This information needs to be corrected. The Bureau of Land Management, Department of Interior, only regulates mines on lands managed by the BLM. The U.S. Forest Service (USFS), Department of Agriculture, regulates mines on USFS administered lands. The states of Colorado, New Mexico, and Utah regulate all hard rock mining, whether on federal, state, private, or tribal lands. The State of Arizona only regulates hard rock mining on state, private, and tribal lands, but not federal lands. There are also other state and federal air and water quality permits applicable to uranium mines.

4.3. Section 2.1.1 Uranium Mining and Milling (page 2-4)

COMMENT:

The description of the uranium milling process misses a few things. Another source of uranium for the White Mesa Mill, the only permitted, operating conventional uranium mill in the U.S., is the processing of uranium bearing wastes from other mineral

[8] BLM NEPA Register: <https://eplanning.blm.gov/eplanning-ui/project/2017885/510>

071-6 (cont'd)

public comment period, this notification list was expanded to include notifications near DOE National Laboratories and newspaper distributors specific to Tribal communities. In addition to the previously listed placements, these notices were placed in South Dakota, Washington DC, Oklahoma, California, Nevada, and Washington, as well as regional placements in the Pacific Northwest and several national placements.

Without knowing locations of proposed HALEU facilities and activities, DOE offered virtual meetings to provide for comments on a national level. DOE also hosted an in-person Tribal Listening Session in Chandler, Arizona. This session was held in coordination with another Tribal conference and was conducted to receive feedback from Tribes historically affected by uranium mining and milling activities.

DOE did consider all information provided by the public during both the scoping and Draft EIS comment periods. Any relevant edits based on public input are reflected in the Final EIS and all comments are included in the CRD.

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processing operations. These materials are known as "alternate feed materials." Also, the description of the milling process leaves out the disposal of the wastes from the processing in tailings impoundments, also called tailings Cells. Since only a small portion of the ore is removed to produce uranium, and chemicals are added during the milling process, large amounts of tailings are disposed of in what are referred to as 11e. (2) byproduct material impoundments. After mill closure and reclamation, the tailings impoundments that have solid tailings must be kept under government control in perpetuity. Also, there are chemical and radiological emissions from the processing operations. The DOE should have included diagrams of conventional mill processing and a conventional uranium mine that show these aspects of uranium mining and milling.

071-6 (cont'd)

4.4. Section 2.6 Summary of Environmental Consequences of the Proposed Action and No Action Alternatives (page 2-22 to 2-39)

COMMENT:

The Summery of Environmental Consequences of the Alternatives is too general to be meaningful. It does not provide an opportunity to really verify and analyze the impacts of the Proposed Action, let alone cumulative impacts and the development of mitigative measures. There will be impacts for which there is no accurate and meaningful environmental analyses. The DEIS lacks the required particularity and specificity and, therefore, comes to unsubstantiated conclusions.

4.5. Section 2.6.1.1. Land Use (page 2-28)

This section of the DEIS contains the statement: "Construction and operation would likely occur on previously disturbed land and be compatible with land use plans and zoning."

071-10

COMMENT:

This section is so general as to be meaningless in the context of uranium mining and milling. There is no information to substantiate the claim that construction and operations related to uranium mining and milling would be on previously disturbed land and be compatible with land use plans and zoning. The location of many uranium mines and uranium recovery facilities are outside local land use and zoning regulatory programs. Most state and local land use codes do not apply to lands administered by the federal government. So, local land use and zoning regulations would not apply to a uranium mine on BLM or USFS lands. This is an unfortunate situation, as communities and tribes loose control of the use of federal lands for mineral production that impacts their welfare.

4.6. Section 2.6.1.2 Visual and Scenic Resources (page 2-28)

This section of the DEIS states: "Construction and operation of HALEU fuel cycle facilities at existing uranium fuel cycle facilities would occur on sites of poor visual quality . . . ." And, "Construction and operation impacts for the individual HALEU activities located at existing fuel cycle facility locations are estimated to be SMALL with total impacts estimated to be SMALL"

071-11

071-10 DOE acknowledges the lack of site-specific locations in its EIS and consistent with 40 C.F.R. 1502.21 includes a detailed explanation, in the EIS, Appendix A and the 500+-page Technical Report (Leidos, 2023) of the credible information that its analysis is based on as well as the research and evaluation methodologies used by DOE to extrapolate reasonably foreseeable impacts. The EIS used the latest NEPA analysis for certain potential sites, and surrogates for others, to allow subject matter experts (SMEs) to assess the potential impacts from the use of the resources for production of HALEU. Appendix A of Volume 2 discusses how the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors, who are SMEs in their respective fields, used their education, working knowledge, experience, and professional judgement to extrapolate the potential environmental consequences associated with the Proposed Action. Throughout Appendix A, and as now added to Volume 1 of the EIS, the reader is directed to the supporting 500+-page Technical Report (Leidos, 2023). The Technical Report is available to review through the project website. This Technical Report (Section 1.1.2, "Existing NEPA Documentation," and Section 10, "References") documents the review of existing NEPA documentation for constructing and operating uranium fuel cycle facilities. The detailed information contained in the Technical Report was not included in the body of the EIS or appendices because the authors wanted to (1) facilitate a clear and concise presentation of the important aspects of the Proposed Action and associated potential environmental consequences and (2) minimize sorting through the enormous amount of technical information reviewed in the existing NEPA evaluations. References to the Technical Report have been added to the Final EIS to highlight for readers where additional support and underlying bases for conclusions in the EIS can be found.

071-11 Section 2.6.1.2 of the EIS (Volume 1) has been revised to remove the statement that existing facilities occur on sites of poor visual quality, and Section 3.1.2 (Volume 1) has been revised to acknowledge existing visual resources that occur in historic mining areas. The impact analysis for the Proposed Action was based on existing NEPA documentation for existing mining and milling sites, which concluded that impacts from construction and operation of mines in licensed regions would be small (with the exception of the Hank Unit associated with the Nichols Ranch ISR facility, for which impacts were determined to be moderate due to its proximity to the Pumpkin Buttes Traditional Cultural Property. At the time that EIS was written [2011], NRC was consulting with BLM, SHPO, the applicant, and interested Tribes to mitigate that impact). Impacts associated with HALEU mining/milling would be expected to be less than those impacts identified in existing NEPA documentation, as mining and milling services required to support HALEU reactors would be a fraction of the overall services required for existing LEU reactors. As a result, the EIS

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James Lovejoy/DOE/HALEU EIS Comments 9
April 22, 2024

COMMENT:

The DEIS claims regarding Visual and Scenic Resources are foolish and unsubstantiated. Many would not agree that existing uranium mines and mills are at sites with "poor visual quality." From the White Mesa Uranium Mill, one can see the Bears Ears, the iconic formations that are part of the Bears Ears National Monument and the source of the Monument's name,

White Mesa itself is its own Archaeological District, which has been found eligible for inclusion in the National Register of Historic Places. The background of the uranium mines in La Sal are the La Sal and Abajo Mountain ranges. Uranium mines are surrounded by beautiful landscapes and vegetation. The Pinyon Plain Mine is about 7 miles from the south rim of the Grand Canyon.

Based on EFRI statements and applications, the impacts to land from expansion of existing uranium mines and the White Mesa Mill would increase. The BLM has already approved a 10-fold increase in the size of the Dineros Uranium Mine, San Juan County, Utah, from 6.5 acres to 65 acres. The mine is still on standby, but could commence operation and expansion in the future.

The current operation of the La Sal Mines Complex will increase the size of the Pandora and La Sal mines waste rock piles, which will be reclaimed in place. EFRI has announced intent to expand their operations to other sites in Utah where they have mineral claims. Mine expansion also includes new exploration drilling, groundwater drilling, and ventilation shafts. EFRI has applied for a permit to construct two new tailings impoundments (Cells 5A and 5B).[9] Each Cell would be a maximum of 40 acres, plus impacts to the area surrounding the Cells and for disposition of the overburden. With plans for developing new mines, expansion of the Mill to accommodate tailings from new mines and expansion of permitted mines is a possibility.

071-11 (cont'd)

New mines and uranium mills proposed by EFRI and other companies would greatly increase surface impacts from uranium mining. One of EFRI proposed mines is the Roca Honda Mine, a new underground uranium mine on Mt. Taylor, in the Cibola National Forest, McKinley County, New Mexico. The surface disturbance area would be 183 acres, far larger than other uranium mine projects. Western Uranium and Vanadium Corp., another Canadian company, purchased about 300 acres within the Green River, Utah, city limits for a proposed uranium mill. Other companies are impacting land, some near the Bears Ears National Monument, with uranium exploration drilling. These impacts are cumulative. Due to the dry climate, impacts from roads and clearings developed for uranium exploration in the 1950s and '60s, are still visible from the air.

4.7. Section 2.6.1.4 Water Resources (page 2-29)

This section states: "Construction of HALEU fuel cycle facilities at existing uranium fuel cycle facilities would generally produce SMALL short-term (lasting months

071-12

[9] DWMRC: <https://deq.utah.gov/waste-management-and-radiation-control/white-mesa-uranium-mill-tailings-cells-5a-5b-license-amendment-request-energy-fuels-resources-usa-inc>

concludes that impacts to visual and scenic resources would be small overall, with moderate impacts possible at some facilities, dependent on site-specific conditions/resources. It is expected that once sites are selected, additional, site-specific environmental analyses would be conducted by the cognizant regulatory authority and would include consideration of measures to minimize, and mitigate for impacts to visual resources, as required. With no specific sites selected, this EIS provides a high-level impact analysis of mining and milling activities that is not site-specific. Additional detail regarding impact considerations is provided in the Technical Report (Leidos, 2023), as referenced in the EIS.

071-12 Potential long-term impacts to water resources associated with mining are discussed in Section 3.1.4, Volume 1, and the Technical Report (Leidos, 2023), as referenced in Section 3.1.4. Additionally, the EIS (Volume 1, Section 3.1.4) has been revised to include additional detail related to impact minimization during mine operations, including the potential need for NPDES permits and pre-approved, mine-specific operating plans, and Chapter 6 has been revised to include a list of Federal laws/permits that may be relevant to the Proposed Action. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies would be involved in authorization of the HALEU activities, including mining and milling, and will have obligations to comply with applicable environmental requirements. Table A-1 has been revised to include contamination of groundwater.

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

or a few years) impacts on water resources. Individual fuel cycle facilities could use from almost no water (minimal amount for HALEU storage) to up to a couple of million gallons per day (ISR mines potentially could require the most)."

COMMENT:

The impacts to ground water from existing and future uranium mines that are wet mines would have significant and long-lasting impacts. Some uranium mines have mine water that seeps, or even flows, into the mine workings. The Pinyon Plain Mine in Arizona, the Energy Queen and Rim Mines in Utah, and the planned Roca Honda Mine in New Mexico are wet mines. The mine water must be removed during mine development and operations. If the water is to be discharged from the mine site, the mine must have a water treatment system and a National Pollution Discharge Elimination System (NPDES) Permit. The mine is also supposed to have a Groundwater Discharge Permit and monitoring wells. When the mine is on standby or after operation, the mine workings flood and there is the potential for contamination of ground and surface water from the flooded mine. However, there is no requirement to monitor the water near the mine site during periods of non-operation or after mine closure. So, there is the potential for mine water containing radionuclides and other contaminants to migrate from the mine workings into the surrounding aquifer, but there is no way to determine what is going on beneath the surface. If the Rim and Energy Queen Mines were to reopen, millions of gallons of water would have to be pumped from the mine, treated, and discharged off-site. Also, uranium milling uses large amounts of water in an area of minimal rainfall.

071-12 (cont'd)

4.8. Section 2.6.1.5 Air Quality (page 2-29)

This section states: "Air quality permits would be required for the control of both nonradiological and radiological emissions applicable to any site chosen; the quantities of emissions would not change from site to site."

COMMENT:

The section on Air Quality is so general that it is meaningless. There are no references and various types of operations are lumped together. The emissions from similar types of facilities, such as uranium mills, would be different depending of the facility. Emissions from any one facility even change during the year, depending on the materials stored and processed at the facility and the development of the facility over time. Additional tailings impoundments mean an increase in emissions. Closure of a tailings impoundment means an increase in emissions while a tailings cell is drying out and reduction in emissions when clean materials are placed on the tailings and final reclamation commences. Emissions increase when ore and other materials to be processed are being stockpiled at a mill and when the mill is processing ore or other feed materials.

Air quality permits do not mean that there are no emissions; the permits just set limits on those emissions and actions that must be taken if emission limits are exceeded. Air quality permits for the White Mesa Mill do not put controls on emissions that cause bad smells that a nearby Indigenous community is exposed to. The Indigenous

071-13

071-13 Thank you for your comment. The phrase "…the quantities of emissions would not change from site to site" in HALEU EIS Section 2.6.1.5 has been deleted. The Technical Report (Leidos, 2023), in support of this EIS, provides detailed air quality impact analyses for each activity associated with the Proposed Action, as requested in the comment. This detailed information is summarized at a high level in Section 2.6.1.5 to streamline the EIS and maintain Chapter 3's focus on resources with potentially MODERATE and LARGE impacts. Greenhouse gas (GHG) emissions and the social cost of climate change are discussed in cumulative impacts in Section 4.3.2 and summarized in Section 2.7.1.3. Additionally, the text in the Final EIS has been revised to better describe the linkage between the information presented in Volume 1, Appendix A, and the Technical Report. Hot links are provided throughout the Final EIS to directly link the reader to the appropriate sections of the Technical Report that provide the justification for the key air and other impact area conclusions. The air quality affected environment and impacts for each activity in the Technical Report are described in Section 1.3.5 and Table 1-4 for ISR, conventional mining, and conventional milling; in Section 2.4.2.5 and Table 2-6 for uranium conversion; in Section 3.3.5 and Table 3-22 for uranium enrichment; Section 4.3.5 and Table 4-7 for uranium deconversion; Section 5.3.5 for uranium storage; Section 7.3.5 and Table 7-10 for HALEU fuel fabrication; and in Table 8-2 for construction and operation of HALEU fueled reactors.Regarding the request to address cumulative air quality impacts, as discussed in Section 4.0 of the HALEU EIS, due to the large number of activities and potential facilities evaluated in this HALEU EIS and the uncertainty of the numbers and locations of facilities, a cumulative effects analysis for the majority of Proposed Action and related activities is not possible. However, DOE expects that new or modified HALEU production facilities would be licensed and subject to additional environmental reviews, and that such reviews would include consideration of cumulative effects by the NRC, an Agreement State, or other Federal agencies.

community close to the White Mesa Uranium Mill complains about the bad smell coming from the Mill when the Mill is processing ore.

The DEIS should have provided substantive information about the radiological and non-radiological emissions from various types of fuel cycle facilities and addressed cumulative impacts. 071-13 (cont'd)

4.9. Section 2.6.1.7 Historic and Cultural Resources (page 2-30)

This section states: "Construction of HALEU fuel cycle facilities at existing uranium fuel cycle facilities would generally produce SMALL to MODERATE (from mining and milling and fuel fabrication facility construction only) impacts on historic and cultural resources." And, "Impacts to historic and cultural resources could be mitigated through measures such as license conditions. The impacts of construction and operation at other industrial sites or previously undeveloped sites would be expected to be similar."

COMMENT;

The statements above regarding impacts to Historic and Cultural Resources have no basis in fact. For the only operating uranium mill in the U.S., an expansion of the White Mesa Mill will mean the destruction of significant historic and cultural resources, similar to the destruction of historic and cultural resources that occurred when the Mill was first constructed and that occurred from new tailings impoundment construction. The significant cultural resources destroyed in the past and expected to be destroyed in the future if additional tailings cells are constructed include pre-historic kivas, pit houses, burial sites, artifacts, food storage areas, and other evidence of the prehistoric and early Indigenous communities on White Mesa. Mitigative measures mean that archeological investigations are carried out and small artifacts are removed, then a bulldozer comes in and destroys the site. Over 30 such sites have already been destroyed by the White Mesa Mill. The development and operation of the Roca Honda Uranium Mine in McKindly County, New Mexico, would take place on Mt. Taylor, held sacred by the Diné (Navajo) and nearby Pueblo communities. There are NRC documents in the NRC Legacy Library that document the archeological investigations and the significant cultural resources that were destroyed. 071-14

4.10 Section 2.6.1.2.6.1.8 Infrastructure (page 2-30)

This section states: "Operation of facilities would have similar infrastructure demands regardless of where the facility would be located; fuel, electricity, and water demands are relatively unaffected by location."

COMMENT:

This section provides no meaningful information about the facilities under consideration and the ecological resources that could be impacted. There is no analysis of cumulative impacts to ecological resources. There is no data and information to support the DEIS's assumptions regarding Ecological Resources. It is not true that the operation of a specific uranium mine, uranium mill, or other uranium recovery facility would not be affected by the location of the facility. Each uranium mine and uranium recovery facility is unique in its operation and the impacts to ecological resources. 071-15

071-14 DOE's impacts analysis for existing fuel cycle facilities is based on existing NEPA analysis and also assumes that consultations, such as Section 106 consultation under the National Historic Preservation Act – would be conducted by the relevant regulatory authority, and that mitigations would be required to reduce the impacts to the greatest extent practical. Please see Appendix A and Sections X.3.7 (depending on the activity, [e.g., Section 1.3.7. for mining and milling impacts]) of the Technical Report for the impact analysis methodology and more information on how the impacts conclusions are reached. The Department has requested proposals from commercial vendors regarding HALEU procurement and deconversion services. Related to that process, the Office of Nuclear Energy plans to publish press releases that coincide with the selection of awardees. These notifications, however, will not coincide with the HALEU EIS, as the Department does not expect locations to be determined as a part of the Record of Decision for this EIS. Once the Department selects awardees and gains additional information, the Department may also consider sending notifications to Tribal governments in the relevant states or with vested interests in the relevant locations. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental and Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other federal agencies.

071-15 Ecological resources are discussed in Appendix A for each type of HALEU fuel cycle facility, ecological resource information for mining is provided in Section A.1.3.5. Additional information is provided in the Leidos Technical Report (Leidos, 2023). The record of decision for this EIS will not result in the selection of specific locations or facilities; therefore, this EIS does not include site-specific analysis for ecological resources. However, if the Proposed Action is undertaken and contracts awarded thereunder, the awardee(s) will be required to apply to and obtain licenses/permits from appropriate regulatory authorities (e.g., the NRC, other Federal agency, or Agreement States) and these regulatory agencies will be required to comply with applicable NEPA requirements or state equivalents. At that time, DOE expects that site-specific environmental analysis would be conducted by the relevant regulatory agency. As such, ecological resources should be analyzed and assessed specific to the proposed impact area. Specific facility sites are not being proposed or selected by this EIS and ROD. As such, and as discussed further in Section 3, "DOE's approach to the impact analyses in the HALEU EIS was to summarize information from existing NEPA documents as an indication of the potential impacts from future HALEU activities. Although impact information from uranium fuel cycle facility

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

4.11. Section 2.6.1.9 Noise (page 3-33)

COMMENT:

The DOE is making unsubstantiated assumptions regarding noise and its impacts from operating underground uranium mines.

The DOE does not appear to be aware of the extremely loud noise created by uranium mine ventilation shafts that bring fresh air into the mines and expel radon and other radionuclides from the mine. When the mine is operating, the noise from the fans at the top of the shafts can be heard for long distances. This noise can disturb birds, nesting birds, other wildlife, livestock, and nearby inhabitants. When the Beaver Shaft is operating in the small town of La Sal, one can hear the loud, continuous, industrial noise just driving through town.

071-16

4.12. Section 2.6.1.15 Environmental Justice (page 2-33)

COMMENT:

The section on Environmental Justice ignores the adverse impacts from the operation of the only operating conventional uranium mill in the U.S. on the nearby White Mesa Band Ute Mountain Ute community and the cumulative impacts to the health and well being of that Indigenous and low-income community. It ignores the potential impacts from the operation of the La Sal Mines Complex on the small, rural community of La Sal. It ignores the potential impacts from the operation of the Roca Honda Mine in New Mexico on nearby Indigenous and low income communities. It ignores impacts from the operation of ISL uranium recovery operations on low-income and Indigenous communities. It ignores the cumulative impacts to those communities from uranium mining and milling since the 1940s.

071-17

4.13. Section 2.7 Summary and Comparison of Cumulative Effects (page 2-36)

COMMENT:

There will be un-analyzed cumulative impacts from existing and proposed uranium mining and uranium recovery operations. Future uranium mining and uranium recovery can be expected to occur in areas that have been previously impacted by past uranium industry operations. Many of those impacts continue to this day, such as contamination of land and ground and surface water. It would not be difficult to analyze the expected cumulative impacts from the operation of existing uranium recovery operations and operating mines and mines proposed by current mill owners. The DOE should analyze the cumulative impacts from the operation of existing fuel cycle facilities that will be involved in HALEU fuel production and the cumulative impacts from newly licensed operations and possible future operations in the areas of historic fuel cycle facilities.

071-18

NEPA documents was used, it was used because it represents the best available predictive information that could provide an indication of potential impacts from HALEU fuel cycle facilities. It was not used to indicate the impacts at any specific facility or location." After site locations are known, DOE expects that a site-specific environmental analysis, including a site-specific analysis of impacts on Ecological Resources, would be conducted by the relevant regulatory agency.

071-16 Potential noise impacts associated with uranium mining and milling are discussed in Section 3.1.7. The section identifies small to moderate noise impacts associated with the use of equipment. Ventilation fans used in the operation of mines generate noise levels comparable to other equipment types used at the site. As is noted in Section 3.1.7, the extent of noise impacts would be site-specific and would depend on adjacent land uses and receptors.

071-17 The EIS does not ignore impacts to specific communities. However, the analysis is based on a limited number of sites for which NEPA documentation is available and is intended to be representative of impacts at any location. An assessment of impacts at all potential sites is not appropriate for this EIS. Since the EIS is not intended to support site selection (and there is a large number of potential mining sites) site-specific analysis is not possible. The Final EIS has been updated to clearly indicate environmental justice impacts (in Sections 3.1.11, 3.3.8, A.1.3.11, and A.3.3.7) and outreach discussions (in Sections 1.2 and 1.3). The environmental justice impacts were evaluated to the extent practicable based on existing analysis for sites, and surrogates for others, to allow SMEs to predict the potential impacts of the Proposed Action. In addition, links are provided throughout these sections to the appropriate portions of Appendix A and the referenced Technical Report (Leidos, 2023) for the detailed analysis. For further information about DOE's EJ analysis and updates in this Final EIS, please see DOE's response to Comments 056-13 and 056-28.

In the Technical Report (Table 1-3. Minority and Low-Income Demographics for Potential Mining and Milling Locations, page 1-66), the environmental justice analysis included comparing demographics for San Juan County to the state of Utah, the location of White Mesa Mill, La Sal Mines Complex, and the Ute Mountain Ute Tribe. San Juan County was identified as having both minority and low-income populations. Appendix A.1.3.11, Environmental Justice, describes the Roca Honda Mine (in the Cibola National Forest, McKinley County, New Mexico) and indicates that this community would be considered a minority population. Both McKinley County and Cibola County are considered to be communities with environmental justice concerns (page A-18 of the EIS). The EIS concludes that both beneficial and adverse effects on communities with environmental justice concerns would likely be significant and cause disproportionate and adverse effects ranging from SMALL

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

4.14. Section 2.7.1.1 Cumulative Effects of HALEU Spent Nuclear Fuel Storage and Disposition (page 2-37)

COMMENT:

The DOE must consider any unique attributes of HALEU that would affect the safe handling and on-site storage of spent HALEU nuclear fuel, spent fuel transportation, possible temporary storage off-site, and long-term care and storage of spent HALEU fuel. The DOE cannot—and should not—assume that spent HALEU nuclear fuel will behave in the same manner as spent low-enriched fuel and will not have unique attributes that must be considered and anticipated.

071-19

Given the lack of a permanent geologic repository for spent nuclear fuel, the DOE should not fund the development of new types of nuclear fuel that may create new problems for fuel transportation and temporary and long term storage. Continuing to create more fuel, with no long-term solution of the disposition of the spent fuel, is one of the most irresponsible things that the DOE is promoting and participating in. It only adds to the current problems associated with the cleanup of sites and wastes from past U.S. nuclear programs.

5. DEIS Volume I, Chapter 3 Affected Environment and Environmental Consequences

5.1. Section 3.0.1 Assumptions (page 3-2)

This section states, in part: "In addition, construction and operations at all sites are assumed to be conducted in compliance with applicable regulations including regulations for building construction, worker and public health and safety, air and water effluents, and and waste management. These regulations would help to limit environmental impacts regardless of location."

COMMENT:

The DOE assumes there are regulations applicable to the operation of uranium mines for worker health and safety, air and water effluents, and waste management and general protection of the public and the environment. However, this is not the case. Many uranium mines, past and present, are on lands administered by the Bureau of Land Management or U.S. Forest Service. Their regulations apply to hard rock mining, including uranium mining. Neither federal agency has regulations that address the unique attributes associated with uranium mining. There are no federal mining regulations that require on-site monitoring and control of surface radiological contamination at and near the mine site during mine operation or long periods of standby. Utah, where most permitted uranium mines are located, does not have any regulations that require on-site monitoring and control of surface radiological contamination at and near the mine site during mine operation or long periods of standby. Uranium mines in Utah can remain on standby for decades, delaying site reclamation indefinitely. New Mexico and Colorado limit standby to 10 years.

071-20

to MODERATE. The beneficial effects could occur by improving economic prospects for approximately two decades of the mine life in an area with high unemployment, high poverty rates, and high minority populations. The adverse effects would stem from factors such as health and environmental risks as well as spiritual and psychological harm inflicted on American Indian populations. Mitigations could be utilized to minimize the potential impacts.

Finally, DOE notes that in the absence of specific site locations, DOE contacted all federally recognized Tribes through formal letters and hosted three Tribal listening sessions to determine Tribal concerns about the Proposed Action. Additional notifications were also sent via Tribal newspapers/newsletters, email notifications, and social media to solicit Tribal input throughout the comment period. At this time, DOE has received two government-to-government consultation requests from the Morongo Band of Mission Indians and from the Agua Caliente Band of Cahuilla Indians. Please see Section 6.1, "Consultations," of the Final EIS for additional information about Tribal consultation. DOE remains open to additional government-to-government consultation requests. See Section 1.3.1 of the EIS for additional information on DOE's public outreach, including to Tribes.

Cumulative effects are presented in Section 4 of the EIS. In addition, DOE assessed cumulative burdens on disadvantaged communities using its Energy Justice Dashboard. DOE's analysis considered a census tract that ranks in or above the 80th percentile of the cumulative sum of 36 burden indicators for a state and has at least 30% of the households identified as low-income populations as a disadvantaged community. DOE considered disadvantaged communities to include low income, high unemployment and underemployment, racial and ethnic residential segregation, linguistic isolation, high housing cost burdens, distressed neighborhoods, high transportation cost burden and/or low transportation access, disproportionate environmental stressor burden and high cumulative impacts, limited water and sanitation access and affordability, disproportionate impacts from climate change, high energy cost burden and low energy access, jobs lost through the energy transition, and access to healthcare. This analysis is presented in the Technical Report.

071-18 As described in Section 2.7, "Summary and Comparison of Cumulative Effects," of the HALEU EIS, NEPA documentation exists for many of the activities that would be associated with a HALEU fuel cycle. Most, but not all, of those NEPA documents (see Appendix B, *Facility NEPA Documentation*) contain cumulative effects analyses for the specific facilities and locations. However, it is not possible to extrapolate those analyses to sites where no cumulative effects analysis has been performed. Further, because of the large number of activities and potential facilities evaluated in this HALEU EIS, and the uncertainty of the numbers and

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

There is no requirement to monitor the possible spread of contaminated mine water from flooded wet mines into the surrounding aquifers during lengthy periods of standby and after site reclamation. Groundwater monitoring only occurs when the mine is operating. There are state or federal regulations that prevent the release of radon from an underground uranium mine in the vicinity of an elementary school, U.S. Post Office, community center, or school, as happens in La Sal, Utah. Wastes from uranium mines will remain at the mine site indefinitely, but there are no requirement for long-term monitoring and care. These waste rock piles will eventually erode, spreading contamination on public lands and aquifers.

The expansion of uranium mining to new mine sites and the continued operation of existing uranium mines will only add to the waste rock, radon emissions, surface radiological contamination, groundwater contamination, and adverse impacts to community and worker health and safety.

071-20 (cont'd)

5.2. Section 3.0.1 Assumptions (page 3-2)

This section states, in part: "Operational activities at any of the HALEU fuel cycle facilities would generally not be affected by the location of the facility. Impacts associated with facility operations would result from the processes needed to perform the activity (i.e., uranium conversion, enrichment, etc.), not where the activity is being performed."

COMMENT:

This is an incorrect assumption when it comes to uranium mines and uranium recovery operations, Impacts from these operations are greatly affected by site location and site attributes. These would include proximity to human communities and activities; nature of local ground and surface water; proximity to and impacts to significant cultural resources; and proximity to Indigenous, low income, and other communities that will be specifically and uniquely adversely impacted by the operations. Location impacts also include local educational and financial resources and the ability of the community and individuals in the community to understand and respond to siting and operational challenges and regulatory decisions and oversight.

071-21

5.3. Section 3.0.1 Assumptions. Undeveloped (Greenfield) Sites (page 3-4)

This section states, in part: "DOE expects that site-specific environmental justice analysis would be required as part of the licensing process for any new facility by the NRC, Agreement States, or other Federal agencies."

COMMENT:

The DOE has not provided a basis for their assumption that a site-specific environmental justice analysis would be required as part of the licensing process for any new facility by an NRC Agreement State that would license new uranium mill. To the best of my knowledge, the NRC Agreement State of Utah, is not required to produce a site-specific environmental justice analysis for a new uranium mill or amendments to an existing uranium mill license. There would be no environmental justice analysis requirement for a new uranium mine on private, stare, or tribal lands in Utah.

071-22

locations of facilities, a cumulative effects analysis for the Proposed Action and related activities would be speculative and is not possible. DOE expects that new or modified HALEU production facilities that would be licensed and subject to additional NEPA or equivalent state evaluation by the NRC, an Agreement State, or other Federal agencies would include consideration of cumulative effects by the relevant regulatory body. Regarding mines, DOE does not know which existing or new domestic uranium mines would supply uranium that would be used to produce HALEU, and DOE does not know how much of the uranium produced by a mine would be used to produce HALEU. Some mines might never supply uranium for use in producing HALEU. For mines that do supply uranium for the HALEU program, the entire uranium output of the mine might be used in one year and then not used the next year, or a varying percentage of the mine's capacity could be used each year (e.g., 10% one year and 70% the next year). Overall, the amount of uranium needed to produce 50 MT per year of HALEU is approximately 12% of the amount of uranium used in the U.S. to supply commercial reactors that operate using LEU. Therefore, one would expect that only a small portion of the overall impacts from uranium mining would be associated with the production of HALEU.

071-19 SNF has a long history of being safely managed and that management is subject to extensive regulatory requirements. These requirements address packaging, transportation, and interim storage. The characteristics of the various potential HALEU fuel assembles and therefore the associated characteristics needed for analytical evaluations cannot be known at this time and are not ripe for NEPA evaluation. When a HALEU fuel assembly design is prepared, the cognizant regulatory authority will perform the NEPA evaluation as part of the licensing and permitting processes. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

5.4. Section 3.1 Uranium Mining and Milling (page 3-5)

This section states: "For example, if ISR mining had potentially MODERATE impacts but conventional mining and milling had SMALL impacts, only ISR would be discussed. As a result, conventional milling is not discussed further in this section. The White Mesa Uranium Mill located in San Juan County, Utah, is currently the only operating mill in the United States. Operations would occur within the existing facility and no additional construction activities associated with continued operation, other than the potential construction of new lined tailings impoundments, would be expected. Additional impacts would be considered SMALL across all resource areas due to the disturbed nature of the site."

COMMENT:

The DEIS should fully access the potential impacts of conventional uranium mining and milling that would be associated with HALEU production and not just assume that some of the impacts would be small.

As discussed above, there will be significant impacts from new uranium mining operations, continuing operation of existing mines, the siting of a proposed new conventional uranium mill, and the expansion of the White Mesa Mill. The anticipated construction of two new lined tailings impoundments at the White Mesa Mill—Cells 5A and 5B—will impact a large area of land within the White Mesa Mill property that has not been previously impacted by Mill construction.[10] Two new tailings impoundments would increase the radiological emissions from White Mesa and destroy significant cultural resources. The expansion of existing uranium mines in Utah (La Sal Mines Complex, Tony M, Energy Queen, and Daneros), development of new mines on claims owned by EFRI, and new uranium mines undergoing regulatory reviews in New Mexico (Roca Honda and La Jara Mesa) will also result in significant impacts. These projects and their impacts should be identified and carefully analyzed in the context of this DEIS.

The DEIS should analyze the impacts to Land Use, Visual and Scenic Resources, Water Resources associated with conventional uranium mining.

071-23

5.5. Section 3.1.11 Environmental Justice (page 3-9 to 3-10)

This section states: "Construction and operation impacts on communities with environmental justice concerns at existing ISR and conventional mines are likely to be SMALL"

COMMENT:

Here, the DOE leaves out the environmental justice concerns associated with the operation of the White Mesa Mill, the Pinyon Plain Mine, and the La Sal Mines Complex. The DEIS fails to discuss the disproportionate impacts from the operation of the White Mesa Mill on the White Mesa Ute and other tribal communities in SE Utah, the Havasupai community in the Grand Canyon that is impacted by the nearby Pinyon Plain Mine, and the small, rural community of La Sal, which is impacted by the Ls Sal Mines Complex, located adjacent to the community.

071-24

[10] DWMRC: <https://deq.utah.gov/waste-management-and-radiation-control/white-mesa-uranium-mill-tailings-cells-5a-5b-license-amendment-request-energy-fuels-resources-usa-inc>

is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. The cognizant licensing and permitting regulatory authorities oversee the construction, operation, and closure of mines consistent with and as required by laws and regulations. The uranium ore mined and processed to produce the HALEU under the Proposed Action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no mine or milling wastes with unique characteristics, and these wastes have a path to disposal. Waste quantities generated would represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See section 2.6.1.10 for more information. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

071-20 Thank you for your comment. The EIS acknowledges potential adverse impacts that may result from the Proposed Action and describes mitigation measures that would minimize potential impacts to surface waters, groundwater, human health and safety, and the other resource areas analyzed. Although legacy contamination has occurred from past uranium recovery and enrichment activities, significant evolution of practices, regulations, and oversight has greatly reduced the potential for contamination. This includes defined roles and responsibilities of various federal agencies regarding abandoned uranium mines (AUMs) including:

- EPA efforts to execute enforceable agreements with potential responsible parties (PRPs) for mine cleanup, oversee trust settlements, and conduct fund-lead

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

These operations and the nearby affected communities must be included in any DEIS Environmental Justice analyses.

5.6. Section 3.1.11 Environmental Justice (page 3-9 to 3-10)

This section states regarding Environmental Justice and the proposed Roca Honda Mine in New Mexico: "Impacts on communities with environmental justice concerns from construction and operation of a conventional mine at the proposed Roca Honda site (brownfield site) in McKinley and Cibola Counties, New Mexico, are expected to be SMALL to MODERATE." And, "The Roca Honda EIS is currently on hold while the operator waits for better market conditions (USDA, 2013). A Supplement to the EIS is being prepared to add an alternative to address the communities' concerns." The DEIS also identifies the Roca Honda Mine as a "brownfield site."

COMMENT;

The proposed Roca Honda site is expected to have a surface disturbance area of 183 acres. The application is for a new underground uranium mine, which will require the removal and treatment of large amounts of ground water during mine development and operation. If it is a "brownfield" site, the DEIS should describe the nature and extent of the "brownfield" area that would be impacted by the development and operation of the Roca Honda Mine. The DEIS should provide information on the impacts to previously undisturbed land within the site boundary.

The USFS has placed their review of the Roca Honda Project on hold. The USFS has not announced their intent to supplement the EIS. The Final EIS for the site has not been released. Therefore, the DOE has no basis for its assumption that "Impacts on communities with environmental justice concerns from construction and operation of a conventional mine at the proposed Roca Honda site (brownfield site) in McKinley and Cibola Counties, New Mexico, are expected to be SMALL to MODERATE." Also, in addition to Environmental Justice concerns, there are other environmental impacts and concerns associated with the development and operation of the Roca Honda project.

071-24 (cont'd)

6. Draft Environmental Impact Statement, Volume II

6.1. Section A.1 Uranium Mining and Milling. A.1.2 Analysis Methodology, A.1.2.1 Approach to NEPA Analyses (page A-2).

This section contains a list of permitted ISR mining in five locations and a list of existing permitted conventional mining locations.

COMMENT:

The Crownpoint ISL uranium recovery site in McKinley County has never operated. According to the NRC, on November 13, 2014, the NRC staff placed its review of the license renewal application in abeyance until further notice.[11] The DOE should reach out to the NRC for an update on the status of this ISL operation.

071-25

[11] <https://www.nrc.gov/materials/uranium-recovery/license-apps/crownpoint/crownpoint-schedule.html>

response actions, such as the replacement of contaminated homes as well as assessments of high-priority mines near homes.

- DOE maintains the existing The Defense-Related Uranium Mines (DRUM) Report to Congress and adds information collected by all federal agencies (e.g., DOE, BLM, USFS, BIA, NPS, EPA) so that the database continues to improve in completeness and accuracy. The data assists Federal agencies in performing abandoned uranium mining site inventory and assessment on public land, as well as establishing agreements with EPA for work on state and tribal land and private property to determine if a mine requires reclamation or remediation and what level of priority it should be given.
- DOE works with partner land management agencies on the reclamation of physical safety hazards which represent an immediate threat to human health and safety.
- BLM, NPS and USFS assess and cleanup DRUM sites. The rate of progress of work at those sites is constrained by available funding. These agencies currently leverage program funding, existing agreements, and available Federal funding with states to continue their response actions at the mine sites. USFS is also partnering with EPA regions, as well as states and DOE, to leverage agency resources and collectively address AUMs on USFS-managed land.
- As a trustee for Tribal mine sites, BIA participates in community outreach efforts, ensuring that tribes are informed and consulted both formally and informally. BIA may monitor the ongoing work at tribal mine sites and provide long-term monitoring of institutional controls and completed remedies applied to Tribal lands.

The EIS used the latest NEPA impact data for all potential sites, and surrogates for others, to allow subject matter experts (SMEs) to predict the potential impacts from the Proposed Action. This includes NEPA documentation prepared for permitted mining locations that are currently on stand-by. The Technical Report (Leidos, 2023) provides additional detail on the evaluation of impacts through the incorporation by reference of past NEPA documentation. As discussed in Appendix A, the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors who are subject matter experts in their respective fields (using their education, working knowledge, experience, and professional judgement) to extrapolate the potential environmental consequences associated with the Proposed Action and to determine the range of impacts. As described throughout the Technical Report (Leidos, 2023), ongoing activities at existing facilities (also see Figure 1-3 of the Technical Report) and construction and operation of new facilities

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

The List of Permitted conventional mines includes Coconino County, which is more in the central part of Arizona than the west.

There are no permitted, operating uranium mines in New Mexico. And, the mines in Southwest Colorado are in San Miguel County (Sunday Mine Complex) and Whirlwind Mine (Mesa County). A large part of the underground portion of the Whirlwind Mine is in Grand County, Utah.

6.2. Uranium mills in Utah (page A-3)

This section states, in part: "Milling facilities used to process conventionally mined uranium are located in South-Central Utah (Garfield and San Juan Counties) and Southwestern Wyoming (Sweetwater County). White Mesa in Garfield County, Utah, is the only mill currently in operation."

71-25 (cont'd)

COMMENT:

The White Mesa Mill is in San Juan County, Utah; not Garfield County.[12] The Shootaring Canyon Mill is in Garfield County.[13] The Shootaring Canyon Mill last operated in 1982 and is currently not licensed to operate. The Mill License has been in timely renewal since 2014. The Mill will need a new, lined tailings impoundment, refurbishment, and a renewed License before the Mill can commence operation. The Shootaring Canyon Mill owner does not have any uranium mines that are permitted to operate.

6.3. Section A.1.2.1 Approach to NEPA Analyses (page A-3).

This section states: "The intent of this HALEU EIS is to provide a summary of potential impacts that could occur at new or existing permitted mines and mills, using existing NEPA documentation for existing operations and other available sources, incorporated by reference. Private industry, along with U.S. Nuclear Regulatory Commission (NRC) approvals, would determine the actual mining techniques employed and site-specific NEPA evaluation would be required for changes to existing permitted mining operations. NEPA documentation for both ISR and conventional mining and milling is available as the mines and mills have been utilized for uranium recovery as part of the low-enriched uranium (LEU) fuel cycle. The function and operation of these facilities is identical in both the LEU and proposed HALEU fuel cycle."

71-26

COMMENT:

It does not appear that the DOE has much in the way of existing NEPA documentation for existing conventional uranium mines. The NRC does not have any regulatory authority over conventional uranium mines and mining. Conventional uranium mines would be regulated by a combination of applicable federal regulatory agency (Bureau of Land Management or US Forest Service) if the mine is on federally

[12] DWMRC: <https://deq.utah.gov/businesses-facilities/energy-fuels-resources-usa-inc>

[13] DWMRC: <https://deq.utah.gov/businesses-facilities/anfield-resources-holding-corp>

are, and would be, under the cognizant regulatory agencies NEPA evaluations and associated license and permitting conditions, including facilities located on non-Federal lands. While NEPA may not be part of the licensing review if the action does not have a Federal nexus, in these cases, it would be expected to be subject to the regulations developed by the cognizant state.

071-21 The statement in the EIS has been revised. The intent of the statement was to indicate that the parameters associated with operation of the facility (land usage, water usage, air emissions and liquid effluents, etc.) are dependent upon the activity not the location. Some of the impacts of the construction and operational parameters are affected by the local affected environment. However, the review of multiple NEPA documents from prior existing or planned activities considered the local environments and reached similar assessments of the impact of the facility activities. While the specifics of the impacts would be expected to vary, the magnitude of the expected impacts would typically be expected to be the same for any location. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC or the respective agreement state – see response to Comment 071-20). With no specific sites identified, analyses were high level and not site-specific. This EIS does not analyze site-specific locations or processes/technologies that may be employed by the commercial suppliers.

071-22 If the Proposed Action is undertaken and contracts are awarded thereunder, the awardee(s) will be required to apply to and obtain licenses/permits from appropriate regulatory authorities (e.g., the NRC, other Federal agency, or Agreement States). Under its licensing process, NRC will be required to comply with applicable NEPA requirements in accordance with 10 C.F.R. Part 51 – Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions. Once a site or facility has been selected, specific impacts may be assessed in future NEPA review by the relevant regulatory authority (e.g., NRC). DOE expects that Tribal consultation will be required as a part of such additional environmental analysis. In Utah, unless another federal agency, such as the Bureau of Land Management or the Environmental Protection Agency, is involved in the licensing action, NEPA may not be part of the licensing review as future licensing reviews would be State actions and subject to the regulations developed by the State. Utah does not have specific NEPA requirements that would trigger an EJ analysis.

071-23 Please see the response to Comment 0071-10 and the "Analytical Approach" section of the Reader's Guide in the EIS, which provide further information on the approach utilized in this EIS. As a part of the approach, the HALEU EIS focuses on the more significant information and impacts so stakeholders may more clearly identify and consider the potential impacts. This method is consistent with CEQ NEPA regulations (40 C.F.R. 1502.2(b)) which states, "Environmental impact

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administered land, state mining regulatory agencies, state and federal air and water quality agencies, tribal authority, state water rights agencies, Department of Energy if mine is part of the DOE Lease program, Mine Safety and Health Administration, and local land use codes and regulations. For example: the La Sal Mines Complex is on BLM, US Forest Service, private, and state lands. It has applicable permits from the BLM, U.S. Forest Service, Utah Division of Oil, Gas & Mining, Utah Division of Air Quality, Utah Division of Water Rights, and Mine Safety and Health Administration (MSHA). The nearby Energy Queen Mine, a wet mine on private land, that is on standby, is permitted by the Utah Division of Oil, Gas & Mining, Utah Div. of Air Quality, Utah Division of Water Quality, Utah Division of Water Rights, and MSHA (during mine operation).

071-26 (cont'd)

6.4. Section A.1.2.1 Approach to NEPA Analyses (page A-3).

This section also states: "NEPA documentation for both ISR and conventional mining and milling is available as the mines and mills have been utilized for uranium recovery as part of the low-enriched uranium (LEU) fuel cycle. The function and operation of these facilities is identical in both the LEU and proposed HALEU fuel cycle."

COMMENT:

There is no NEPA documentation for uranium mines on state, private, and tribal lands. The federal government does not have specific regulations applicable to uranium mines during mine operation. Uranium mines are treated as hard rock mines. In Utah, uranium mines are allowed to remain on standby indefinitely, delaying site reclamation. There is no NEPA document for the Sage Mine, on BLM land in San Juan County, Utah.

Radiological contamination at the mine site and nearby is not determined during mine operation, and there is no requirement to remove radiological contamination from the mine site during mine operation and lengthy periods of standby. The federal and state uranium mine regulatory programs are woefully lacking.

Most of the La Sal Mines Complex, one of the major uranium mines that has provided uranium and vanadium ore to the White Mesa Mill since the 1970s, operated off and on from 1981 to 2019, based on a Plan of Operations that was half a page, double spaced, and an EA that is less than 10 pages. The DOE does not have sufficient NEPA documentation regarding uranium mines that provide, or have provided, ore to the White Mesa Mill to make any kind of assumptions and informed analyses regarding the environmental impacts of those uranium mining operations.

071-27

6.5. Section A.1.2.2 Existing NEPA Documentation (page A-4)

This section identifies existing NEPA documentation related to uranium mining and ISL uranium recovery operations.

COMMENT:

The documents reviewed by the DOE include the 2014 DOE Final Uranium Leasing Program Programmatic Environmental Impact Statement (DOE/EIS-0472). Since 2014, there has been no uranium mining associated with the mines in the Leasing

statements shall discuss impacts in proportion to their significance. There shall be only brief discussion of other than important issues," and (40 C.F.R. 1502.15(c)), which states, "Data and analyses in a statement shall be commensurate with the importance of the effect, with less important material summarized, consolidated, or simply referenced. Agencies shall avoid useless bulk in statements and shall concentrate effort and attention on important issues." As discussed in Appendix A, the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors, who are SMEs in their respective fields, used their education, working knowledge, experience, and professional judgement to estimate the potential environmental consequences associated with the Proposed Action. In general, the Proposed Action represents a smaller scale level of activity and footprint compared to the activities and footprints evaluated in the existing NEPA evaluations. For example, the requirements for HALEU commercialization would be about 20% of the conversion capacity of the Metropolis facility. In addition HALEU enrichment would require 1.1 million separative work units (SWUs) per year, which is 37% of the capacity of UUSA of 3 million SWUs. The relatively smaller scale was factored into the SMEs' evaluations and reflected in the impact assessment categories identified in this EIS. Similarly, expansion of ISR or conventional mining operations in existing permitted locations already contain existing infrastructure and similar activities/impacts compared to the activities and footprints evaluated in the existing NEPA evaluations (often evaluating an entirely new facility). Specifically regarding milling, the text in the Final EIS has been revised to better describe the impacts of uranium mining and milling. These results are supported by the detailed evaluations by SMEs of existing facilities reported in the 500+ page Technical Report (Leidos, 2023). The 89-page Section 1 describes the affected environment and impacts for ISR, conventional mining, and conventional milling and summarizes these impacts in Table 1-4. Impact areas evaluated include: land use, visual and scenic resources, geology and soils, water resources, air quality, ecological resources, historical and cultural resources, infrastructure, waste management, noise, public and occupational health-normal, public and occupational health-facility accidents, traffic, socioeconomics, and environmental justice. While there is wide variation in the impacts of operations at specific mine sites, specific ISR sites, and the representative milling site (White Mesa Mill), the SMEs used all the available data to determine the reasonable projected impacts of the Proposed Action. If the White Mesa mill were utilized, operations would occur within the existing facility and no additional construction activities associated with continued operation, other than the potential construction of new lined tailings impoundments, would be expected. Additional impacts would be considered SMALL across all resource areas due to the disturbed nature of the site.

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Program.

The BLM is in the process of developing a draft EIS for the Sunday Mine Complex in San Miguel County, Colorado, and mine development has commenced at the Whirlwind Mine in Mesa County. There has been no other uranium mine development in Colorado since 2014.

The owners of the Sunday Mine Complex have proposed a new uranium mill at Green River, Utah, but no application has been submitted to the Utah Division of Waste Management and Radiation Control. None of the other NEPA documents listed on page A-4 pertain to current permitted uranium mining operations in Utah, Colorado, or Arizona (La Sal Mines Complex, Daneros, Tony M, Rim, Energy Queen Mines in Utah; Pinyon Plain and Arizona 1 Mines in Arizona; and Whirlwind Mine in Colorado). The list does not include environmental reviews associated with the White Mesa Uranium Mill. ***071-27 (cont'd)***

6.6. Section A.1.3 Potential Environmental Consequences, Table A-1 Uranium Mining and Milling - Impact Assessments for Proposed Action by Resource Area (page A-4 to A-8.

COMMENT;

The information in Table A-1 suffers from the failure of the DOE to adequately review and access documents related to all of the relevant operating uranium mines and mills, and to meaningfully engage the public in this process. There were no DEIS scoping meetings in the vicinity of the only operating conventional uranium mill in the U.S. The DEIS preparers know very little about current uranium mining and milling operations. ***071-9 (cont'd)***

Regarding "Water Resources," Table A-1 should include contamination of groundwater from flooded uranium mine workings. There have been no NEPA analyses related to these impacts that I am aware of. ***071-12 (cont'd)***

Regarding "Air Quality," the Impact would range from Small to Large. The Table does not mention the emission of radon gas and other uranium progeny from either uranium mills or uranium mines, or the impacts of the emission of radon and and radioactive particulates on nearby schools, homes, and human activities. The Air Quality Table does not list the types of radiological and chemical emissions from operating mines and mills, nor the bad smells from those emissions, which impact nearby communities. ***071-13 (cont'd)***

Regarding "Historic and Cultural Resources," the Impact would range from Small to Large. The expansion of the White Mesa Mill would destroy significant cultural resources, similar to those resources already destroyed by the Mill construction. These are sites that have been found eligible for inclusion in the National Register and are part of the White Mesa Archaeological District. Mitigation does not include preservation of the sites, it only includes archaeological studies before the ancient home, burial, religious, food storage, and other significant sites are completely destroyed. ***071-14 (cont'd)***

071-24 DOE notes that in the absence of specific site locations, DOE contacted all federally recognized Tribes through formal letters and hosted three Tribal Listening Sessions to determine Tribal concerns about the Proposed Action. Additional notifications were also sent via Tribal newspapers/newsletters, email notifications, and social media to solicit Tribal input throughout the comment period. Please also see Section 1.3.1 of the EIS for additional information on DOE's public outreach, including to Tribes.

The Final EIS has been updated to clearly indicate environmental justice impacts (in Sections 3.1.11, 3.3.8, A.1.3.11, and A.3.3.7) and outreach discussions (in Sections 1.2 and 1.3). The environmental justice impacts were evaluated to the extent practicable based on existing analysis for sites, and surrogates for others, to allow SMEs to predict the potential impacts of the Proposed Action. In addition, links are provided throughout these sections to the appropriate portions of Appendix A and the referenced Technical Report (Leidos, 2023) for the detailed analysis.

Environmental justice was considered to the extent possible given that there are no specific sites selected for the HALEU fuel cycle activities (and the ROD will not specify specific sites). In the Draft EIS, for mining and milling, multiple potential locations were noted. The analysis focused on locations of current facilities. Due to the number of potential facilities, updated demographic statistics based on city, county, and state were provided. In the Technical Report (Table 1-3. Minority and Low-Income Demographics for Potential Mining and Milling Locations, page 1-66), San Juan County, the location of White Mesa Mill and La Sal Mines, was identified as having both minority and low-income populations by comparing demographic data from the county to the state. Appendix A, Section A.1.3.11, "Environmental Justice," describes the Roca Honda Mine and indicates that this community would be considered a minority population. Both McKinley County and Cibola County, New Mexico are considered to be communities with environmental justice concerns (page A-18 of Draft EIS). The section concluded that both beneficial and adverse effects on communities with environmental justice concerns would likely be significant and cause disproportionate and adverse effects ranging from SMALL to MODERATE. The Technical Report analyzed Mohave County in Arizona as a surrogate potential location of a mining facility. Pinyon Plain Mine is located in adjacent Coconino County, Arizona. Once a site or facility has been selected, specific impacts may be assessed in future NEPA review by the relevant regulatory authority.

The beneficial effects could occur by improving economic prospects for approximately two decades of the mine life in an area with high unemployment, high poverty rates, and high minority populations. The adverse effects would stem from factors such as health and environmental risks as well as spiritual and

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Regarding "Waste Management," the Impacts associated with uranium mining and milling are LARGE. Wastes include mine overburden and waste rock, which can remain on the surface until it eventually erodes. The waste rock can contain uranium ore. There are no provisions for long-term monitoring and care and maintenance of uranium mine waste rock piles or overburden (associated with open pit uranium mining). The wastes from conventional uranium mining and ISL uranium recovery operations must be kept under government control in perpetuity, as required by the Atomic Energy Act and NRC and EPA regulation. Mill wastes are referred to, legally, as 11e.(2) byproduct material. A single uranium mill will have millions of tons of 11e.(2) byproduct material the tailings impoundments. And, there are significant cumulative impacts.

071-19 (cont'd)

Regarding "Public and Occupational Health - Normal Operations," the DEIS does not appear to recognize or evaluate the doses to nearest receptors from an operating uranium mine that is about .25 miles from an elementary school, homes, and other human activities. Those doses are not determined by monitoring devices at the receptor site, but are determined by complex calculations, based on a complex computer model and measurement of the radon emissions at the point of discharge. There is no evaluation of the impacts from radioactive particulate emissions and exposure at mine sites themselves and dispersal and accumulation of radioactive particulates on and off-site during mine operations.

071-28

Regarding "Environmental Justice," the impact to the White Mesa Ute Community from the operation of the White Mesa Mill should be considered Large. The same with the impacts to the small town of La Sal from the operation of the La Sal Mines Complex. There are few mitigative measures that would reduce the impacts from the operation of the White Mesa Mill and the La Sal Mines Complex on the nearby communities.

6.7. Section A.1.3.11 Environmental Justice

This section reviews Environmental Justice considerations for two proposed uranium mines in New Mexico, five ISL uranium recovery operations in Wyoming, and one ISL operation in South Dakota. Missing is any mention of Environmental Justice issues associated with the White Mesa Mill and La Sal Mines Complex in San Juan County, Utah, or the Pinyon Plain Mine in Arizona. This is a grave and unacceptable oversight.

071-29

7. Appendix B

7.1. Appendix B Facility NEPA Documentation, Table B-2. Uranium Production Uranium Mining and Milling using Conventional Processes

Table B-2 looks at the NEPA documentation for the DOE Uranium Leasing Program (Colorado) , the DEIS for the Roca Honda Mine (New Mexico), and the DEIS for the La Jara Mesa Mine Project (New Mexico), The DEIS indicates Partial Coverage for the Analysis of NEPA Documentation.

071-30

psychological harm inflicted on American Indian populations. Mitigations could be utilized to minimize the potential impacts. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental justice analysis. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies, when appropriate.

For the Roca Honda Mine, the Draft EIS was only used in DOE's analysis since the Final EIS had not been issued. An update has been made to the EIS (see Section 3) stating that information based on Draft EISs is preliminary in that it has not undergone public review and that Draft EISs were only used when there was not a corresponding Final EIS.

071-25 DOE reviewed existing information regarding mining and milling locations including NRC databases. The information includes existing permitted mines and licensed milling facilities. Some of these facilities have been inactive (on standby) for decades. The scope of the EIS is not to select specific locations for HALEU activities, rather to provide a range of potential impacts using the best available data and information, primarily based on past NEPA documentation. DOE has reviewed the information and made applicable changes to Figure 2.1-1 in the EIS. Please refer to the Technical Report (Leidos, 2023) for a detailed discussion regarding assessment of impacts for mining and milling activities. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report.

071-26 The Leidos Team reviewed the Final Uranium Leasing Program Programmatic Environmental Impact Statement (DOE/EIS-0472) (referred to as the "ULP PEIS") in determining the scope for conventional mining activities, which considers environmental impacts from conventional (underground) mine development in western Colorado (Mesa, Montrose, and San Miguel Counties) (DOE, 2014). The Uranium Leasing Program (ULP) contributes to the development of a supply of domestic uranium consistent with the provisions of the Atomic Energy Act and Energy Policy Action of 2005, which has commitments to decrease the United States' dependence on foreign energy supplies. Although Section 2001 of the Energy Act of 2020 (42 United States Code [U.S.C.] 16281) states the Secretary of Energy "shall consider options for acquiring or providing HALEU…that does not require extraction of uranium or development of uranium from lands managed by the Federal government, cause harm to the natural or cultural resources of Tribal communities or sovereign Native Nations, or result in degraded ground[water] or surface water quality on publicly managed or privately owned lands" (42 U.S.C. 16281: Advanced nuclear fuel availability (house.gov), the Leidos Team is using the ULP PEIS as a reference to gauge the type and magnitude of impacts and mitigations that could be expected if the Proposed Action and post-Proposed Action activities

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James Lovejoy/DOE/HALEU EIS Comments 21
April 22, 2024

COMMENT:

None of the documented NEPA Reviews in this Section apply to an operating uranium mine. The Final EISs for the Roca Honda and La Jara Mesa Mines have not been issued. The permits for the Roca Honda and La Jara Mesa Mines have not been approved. The two mines in New Mexico have yet to be developed.

The DOE failed to review NEPA documents, operating histories (such as inspection reports), and other relevant documentation for uranium mines that have actually been operating over the past 20 years and are providing, or expected to provide ore, to the White Mesa Mill or other uranium mill operation. The status and impacts from those actual operations do not seem to be of significance to the DOE and this HALEU NEPA analysis.

Therefore, the DEIS review of Uranium Mining is seriously incomplete and inadequate. It's not like information about these mining operations are hidden away somewhere and impossible to access, yet the preparers of the DEIS specifically chose to ignore the uranium mine that have recently been, or are currently, being operated to provide ore to a conventional uranium mill.

7.2. Appendix B Facility NEPA Documentation, B.1 Assessment of the NEPA Status of Potential HALEU Facilities. Table B-3. Uranium Production - Uranium Milling

Table B-3 discusses the White Mesa Uranium Mill. Based on a review of the NRC's 1979 Final Environmental Statement Related to Operation of White Mesa Uranium Project (NUREG-0556) and the NRC's 1997 Environmental Assessment for Renewal of South Material License No. SUA-1358, the DOE determined that the Analysis of NEPA Documentation warranted Full Coverage.

COMMENT:

The NEPA documents the DOE reviewed are 27 and 45 years old. A lot has changed since those documents were developed. The NRC no longer regulates the White Mesa Uranium Mill. Since 2004, Mill has been regulated by the Utah Division of Waste Management and Radiation Control (originally, the Division of Radiation Control). There have been many changes in the Mill operation, to the Mill License, regulatory programs, and public awareness and involvement. The 1979 and 1997 NEPA reviews do not reflect current Mill conditions and Mill operations. It is totally misleading for the DOE to claim that they have documents that provide Full Coverage of the environmental impacts associated with the operation of the White Mesa Mill.

The short review Table B-3 makes no mention of the proximity of the Mill to the lands and community of the White Mesa Band of the Ute Mt. Ute Tribe, or the historic impacts to, and destruction of, significant cultural resources that should have been preserved as a National Monument.

The DOE must obtain current information regarding the operation and regulation of the White Mesa Mill and not rely on decades-old environmental reviews.

071-30 (cont'd)

were to be supported through conventional mining on private lands. The analyses in this Technical Report focuses on impacts estimated for Alternative 4 in the ULP PEIS, which evaluated continued operation of 18 underground mines and one large open-pit mine in the project region for at least the next 10 years. Regarding milling of conventionally mined uranium, the Leidos Team reviewed the Environmental Assessment for Renewal of Source Material License No. SUA-1358 for the White Mesa Uranium Mill in San Juan County, Utah, because that facility is currently used for milling conventionally mined uranium from Colorado (NRC, 1997a). In addition to the ULP PEIS (DOE, 2014) and the White Mesa EA (NRC, 1997a), the Leidos Team also reviewed the following site-specific NEPA analyses for conventional mines: Draft Environmental Impact Statement for the La Jara Mesa Mine Project (USDA, 2012) and Draft Environmental Impact Statement for Roca Honda Mine, Sections 9, 10, and 16 (Township 13 North, Range 8 West, New Mexico Principal Meridian, Cibola National Forest, McKinley and Cibola Counties, New Mexico) (USDA, 2013). Although mining operations are regulated by the Bureau of Land Management and the U.S. Department of the Interior on Federal lands, and the individual states on private lands where the mines are located, the NRC regulates conventional milling operations under 10 C.F.R. 40, Domestic Licensing of Source Material. As defined in that regulation, uranium milling is any activity that produces byproduct material. Like Section 11e(2) of the Atomic Energy Act, 10 C.F.R. 40 defines byproduct material as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." However, 10 C.F.R. 40 expands upon this definition by adding, "including discrete surface wastes resulting from uranium solution extraction processes." ISR perform uranium milling under this expanded definition (NRC, 2021b). The regulatory authorities for conventional and ISR mining, and milling activities are further discussed in Section 1.1.2, "Description of the Process," in Volume 1 of the Final HALEU EIS.

071-27 The EIS did use the latest NEPA impact data for all potential sites, and surrogates for others, to allow subject matter experts (SMEs) to predict the potential impacts from the use of the resource for production of HALEU. This includes NEPA documentation prepared for permitted mining locations that are currently on stand-by. The Technical Report (Leidos, 2023) provides additional detail on the evaluation of impacts through the incorporation by reference of past NEPA documentation. As discussed in Appendix A, the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors who are subject matter experts in their respective fields (using their education, working knowledge, experience, and professional judgement) to extrapolate the potential environmental consequences associated with the Proposed Action and to determine the range of impacts. As described throughout the Technical Report (Leidos, 2023), ongoing activities at existing facilities (also see Figure 1-3 of the Technical Report) and construction

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8. In sum, the analysis of the impacts from uranium mining and milling associated with the production of HALEU is misleading, contains irrelevant information, fails to consider Environmental Justice issues related to the operating uranium mill and operating uranium mines, is based on outdated and inadequate information, and does not meet the purpose of the DEIS.

071-31

It is surprising to me that the DOE, with all its billions of dollars, could produce such a poor environmental analysis of the impacts of the HALEU program related to conventional uranium mining and milling.

Thank you for providing the opportunity to comment.

Sincerely,

/s/

Sarah Fields
Program Director

and operation of new facilities are, and would be, under the cognizant regulatory agencies environmental evaluations and associated license and permitting conditions, including facilities located on non-Federal lands. While NEPA may not be part of the licensing review if the action does not have a Federal nexus, in these cases, it would be expected to be subject to the regulations developed by the cognizant State. In general, the Proposed Action represents a smaller scale level of activity and footprint compared to the activities and footprints evaluated in the existing NEPA evaluations. The relatively smaller scale was factored into the subject matter experts' evaluations and is reflected in the impact assessment categories identified in this EIS. Since this EIS does not analyze site-specific locations, site specific analysis is not possible and the inclusion or exclusion of a particular mine does not invalidate the analysis. The environmental impacts assessed in the HALEU EIS are based on the impacts identified in multiple analyses and are intended to provide a representative assessment of impacts at the HALEU fuel cycle facilities related to the Proposed Action.

Environmental reviews associated with the White Mesa Uranium Mill are considered in the Technical Report (Leidos, 2023). Specifically, this includes Federal reviews by the NRC (*Environmental Assessment for Renewal of Source Material License No. SUA-1358, White Mesa Uranium Mill* [1997] and *Environmental Report for White Mesa Uranium Project San Juan County, Utah for Energy Fuels Nuclear, Inc.*, Nuclear Regulatory Commission [1978]), as well as State of Utah reviews (*White Mesa Uranium Mill License Renewal Application State of Utah Radioactive Materials License No. UT1900479*, Utah Department of Environmental Quality [2007]; *Radioactive Material License Renewal Number UT 1900479. Amendment 8*, Utah Department of Environmental Quality [2018]; *Radioactive Material License No. UT 1900479* and *Utah Ground Water Discharge Permit No. UGW370004 Technical Evaluation and Environmental Assessment: White Mesa Uranium Mill Energy Fuels Resources* [2017]).

071-28 The HALEU EIS does address, in Chapter 3 and Appendix A, the potential health impacts of all activities associated with the HALEU fuel cycle activities needed to support the Proposed Action. These include the impacts associated with mining and milling, conversion, enrichment to HALEU levels, deconversion and storage, and transportation. The assessments of potential health impacts are based on multiple NEPA documents and documented in the Leidos Technical Report (Leidos, 2023). This report examines impacts identified in the supporting NEPA documents and uses them to develop estimates of impacts for the same or similar activities associated with the Proposed Action.

071-29 The Final EIS has been updated to clearly indicate environmental justice impacts (in Vol. 1 Sections 3.1.11 and 3.3.8; Vol. 2 Sections A.1.3.11 and A.3.3.7) and outreach discussions (in Sections 1.2 and 1.3). In addition, links are provided throughout these

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sections to the appropriate portions of Appendix A and the referenced Technical Report (Leidos, 2023) for the detailed analysis. Although locations for mining and milling have not been determined, the environmental justice section provides information on communities with environmental justice concerns based on selected locations of current facilities, reviewing past NEPA documents, and updating U.S. Census data for cities, counties, and states. The analysis of environmental justice for mining and milling evaluated potential locations including the following states: Nebraska, New Mexico, South Dakota, Texas, Wyoming, Arizona, Colorado, and Utah (Table 1-3: Minority and Low-Income Demographics for Potential Mining and Milling Locations, page 1-66). As part of this analysis, San Juan County, the location of the White Mesa Mill and La Sal Mines Complex, was identified as having both minority and low-income populations by comparing demographic data for the county to the state. Appendix A, Section A.1.3.11, "Environmental Justice," describes the Roca Honda Mine located in New Mexico and indicates that this community is considered a minority population. Both McKinley County and Cibola County are considered to be communities with environmental justice concerns (page A-18 of Draft EIS). Impact conclusions were based on the published Draft EIS that described as both beneficial and adverse effects on communities with environmental justice concerns. Impacts were determined to be significant and result in disproportionate and adverse effects ranging from SMALL to MODERATE. The beneficial effects could occur by improving economic prospects for approximately two decades of the mine life in an area with high unemployment, high poverty rates, and high minority populations. The adverse effects would stem from factors such as health and environmental risks as well as spiritual and psychological harm inflicted on American Indian populations. Mitigations could be utilized to minimize the potential impacts. The Technical Report analyzed Mohave County in Arizona as a surrogate potential location of a mining facility. Demographic data on Mohave County compared to the state of Arizona did not show the presence of minority or low-income populations. Pinyon Plain Mine is located in adjacent Coconino County, Arizona. Once a site or facility has been selected, specific impacts may be assessed in future NEPA review by the relevant regulatory authority (e.g., NRC).

At this time, DOE is unable to determine whether disproportionate and adverse impacts would be expected at either brownfield or greenfield mining and milling sites as these impacts rely on site-specific analysis. However, the degree of impact is estimated to range from SMALL to MODERATE based on the range of mining and milling impacts on other resource areas (e.g., impacts estimated for health and safety, air quality, transportation, land use, and socioeconomics). DOE expects that site-specific environmental justice analysis would be considered as part of the licensing process for any new facility by the NRC or other Federal agencies. In Agreement States, site-specific environmental justice analysis would be conducted if required by the state licensing process.

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DOE is and remains open to government-to-government consultation requests throughout the EIS process, however, did not receive requests to initiate formal consultation. Please see Section 6.1, "Consultations," of the EIS for more information about consultation opportunities related to the HALEU EIS.

071-30 The EIS used the latest NEPA impact data for all potential sites, and surrogates for others, to allow subject matter experts (SMEs) to predict the potential impacts from the use of the resource for production of HALEU. See Appendix A and the referenced Technical Report (Leidos, 2023). While some of the reference documents are older, most used in the assessment of mining and milling are newer than implied by the commenter, including a 2017 environmental assessment for White Mesa.

Still, DOE acknowledges that the White Mesa Mill is now regulated by the State of Utah and while it is highly regulated by the State, it continues to be controversial. The controversy arises from past or legacy practices for both mining and milling and some ongoing practices, including bringing in ore from other places and leaving the residual materials (tailings) at the facility. In June 2023, U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR), Office of Community Health and Hazard Assessment issued a report. The Ute Mountain Ute Tribe asked the Agency to evaluate how radiation and other chemicals related to uranium milling activities at the White Mesa Uranium Mill might affect the health of tribal members. The mill is located next to Ute Mountain Ute Tribe land. For the scenarios that ATSDR were able to evaluate, ATSDR concluded the following:

- Children and adults living in White Mesa are unlikely to be harmed from breathing radiological contaminants in the air. Residential air exposures do not result in elevated risks of adverse cancer or non-cancer health effects from radiological material. Annual doses from airborne radionuclides ranged from 9 to 23 mrem per year.
- Children and adults who drink the water from the Ute Mountain Ute Tribe public water system are unlikely to be harmed from radiological contaminants. Residential drinking water quality reports are within EPA regulatory limits. For radiological water quality standards, these limits have been shown to be protective of human health and are below the ATSDR minimal risk level and were not evaluated further.

The ATSDR recommended that the Ute Mountain Ute Tribe continue to monitor drinking water and collect air, water and soil samples. That evaluation supports that the air emissions, groundwater contamination, and radiological impacts were well within those initially identified in the NRC.

Commenter No. 71 (cont'd): Sarah Fields, Uranium Watch

The Technical Report considers in the evaluation of impacts through the incorporation by reference of past NEPA documentation that a certain level of resource impact did occur as part of construction or is on-going within existing facility operations. The Final EIS has been updated to clearly indicate detailed and exhaustive approach used by the SMEs to characterize the potential impacts, including those impacts to environmental justice communities. The existing NEPA evaluations were utilized in total to provide a representative range of potential environmental consequences using the best available information. Existing sites likely have legacy characteristics that are not reflective of future construction and/or operational related potential environmental consequences a significant evolution of practices, regulations, and oversight has greatly reduced the potential for contamination. As described throughout the Technical Report (Leidos, 2023), ongoing activities at existing facilities (also see Figure 1-3 of the Technical Report) and construction and operation of new facilities are, and would be, under the cognizant regulatory agencies NEPA evaluations and associated license and permitting conditions (see also response to Comment 070-20). Additionally, since location is unknown at this time, the use of site-specific information such as site inspection reports would be speculative and possibly less representative. Please also see Section 2.4, "Legacy Issues," of this CRD for additional information.

Table B-3 provides a summary of existing NEPA documents that were reviewed for potential NRC and Agreement State-licensed and other permitted uranium fuel cycle facilities that might support the Proposed Action. This table, however, does not include an analysis for proximity to Tribes or other communities with environmental justice concerns. For additional information about environmental justice impacts related to mining and milling activities, please reference Sections 3.1, "Uranium Mining and Milling," in Volume 1; A.1.3.11, "Environmental Justice," in Volume 2; and 1.3.15, "Environmental Justice," of the Technical Report for further information regarding potential mining and milling impacts by on communities with environmental justice concerns.

071-31 The Final EIS has been updated to clearly indicate environmental justice impacts (in Vol. 1 Sections 3.1.11 and 3.3.8; Vol. 2 Sections A.1.3.11 and A.3.3.7). The environmental justice impacts were evaluated to the extent practicable based on existing analysis for sites, and surrogates for others, to allow SMEs to predict the potential impacts of the Proposed Action. In addition, links are provided throughout these sections to the appropriate portions of Appendix A and the referenced Technical Report (Leidos, 2023) for the detailed analysis. For example, in the Technical Report (Table 1-3: Minority and Low-Income Demographics for Potential Mining and Milling Locations, page 1-66), the environmental justice analysis included comparing demographics for San Juan County to the state of Utah, the location of White Mesa Mill, La Sal Mines Complex, and the Ute Mountain Ute Tribe. San Juan County was identified as having both minority and low-income populations.

Commenter No. 72: Claire Baiz

From: Claire Baiz
To: HALEU-EIS
Subject: [EXTERNAL] Public Comment/HALEU Nuclear Fuel
Date: Monday, April 22, 2024 10:00:04 PM

Dear Dept. of Energy:

Please consider my comment regarding your proposed decision to encourage commercial development of HALEU nuclear fuel. I believe companies building new nuclear power plants should bear the risks and costs just like any other industry, rather than counting on an undisclosed/undetermined amount of taxpayer funding. The nuclear industry is looking for federal subsidies to pay for fuel that doesn't yet exist in the U.S., and the Department of Energy proposes to build out the supply chain for this fuel, HALEU (high-assay low-enriched uranium). The DOE analysis is based on speculative nuclear power plant projects that will likely never get built. *072-1* *072-2*

The nuclear industry has not solved the problems of the full life cycle of nuclear fuel, including the negative impacts of additional uranium mining and milling, transportation of fuels, and waste disposal. There is no permanent disposal facility for nuclear waste in the U.S. and until such a facility exists new nuclear power plants are unwise. We shouldn't be creating new nuclear waste when we have no place to safely and permanently store the waste that already exists. *072-3* *072-4* *072-5*

Claire Baiz
c/o Reichert Family
[redacted]

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072-1 Regarding funding, DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on funding.

072-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Regarding comments about the speculative nature of the advanced reactors, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's response.

072-3 DOE acknowledges the occurrence of legacy contamination. Please see Section 2.4, "Legacy Issues," of the CRD for additional information. Please see the response to Comment 056-1 for additional information on DOE's analysis of impacts.

072-4 A detailed transportation analysis was performed for this EIS. Both radiological and nonradiological transportation impacts are described in Section 3.6, "Transportation," of the EIS and Section A.6, "Transportation," of Appendix A. Radiological impacts are those associated with the effects from low levels of radiation emitted during incident-free transportation and from the accidental release of radioactive materials. Nonradiological impacts are independent of

the nature of the cargo being transported and are expressed as traffic accident fatalities resulting only from the physical forces that accidents could impart to humans. Details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Since the EIS does not identify specific locations for fuel cycle facilities, the EIS transportation analysis used some conservative assumptions about the distances traveled during transportation (considering longest distances between the potential locations/facilities of source and product materials [e.g., mines to conversion, conversions to enrichment, enrichment to fuel fabrication and/or deconversion, and deconversion to storage]). Therefore, the analysis is expected to bound the impacts regardless of where the facilities would be located. The analysis considered transportation of all forms of uranium materials: from the mines to the mills, from an ISR or mill to the conversion facility, from the conversion facility to enrichment facilities, from the enrichment facility to a deconversion facility, from the deconversion facility to a storage facility, and from the storage facility to the fuel fabrication facility. For the transportation analysis, all facilities were conservatively assumed to be independently sited (i.e., no co-location of facilities). As discussed in Section 3.6 and in Section A.6 of Appendix A of the Final HALEU EIS, the transportation activities would result in a small collective population risk, which is a measure of the total risk posed to society as a whole. Specific details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Table A-8 of Appendix A in the Final HALEU EIS summarizes the transportation risks for each activity within the HALEU fuel cycle. Specific analysis of the route cited in the comment is outside the scope of this EIS. However, site-specific locations are expected to be proposed in the future and would be evaluated by the cognizant regulatory agency, in many cases the Nuclear Regulatory Commission (NRC) and specific transportation routes and related impacts are expected to be evaluated during that process. See also Section 2.6, "Transportation," of the CRD for additional information.

072-5 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource

Commenter No. 72 (cont'd): Claire Baiz

areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 73: Patricia Marida, Ohio Nuclear Free Network

From: Pat Marida
To: HALEU-EIS
Subject: [EXTERNAL] Marida Comments on DOE"s Draft HALUE EIS (DOE/EIS-0559)
Date: Monday, April 22, 2024 9:23:22 PM
Attachments: Marida Comments on HALEU EIS 4-3-24.docx

Mr. James Lovejoy
DOE EIS document manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
HALEU-EIS@nuclear.energy.gov

Dear Mr. Lovejoy,

Attached please find my comments on the HALEU EIS.
I have done the best I could for Earth Day 2024.

Comments on DOE's "Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) ("HALEU DEIS") (DOE/EIS-0559)

Sincerely,
Pat Marida

Patricia Marida, Coordinator
The Ohio Nuclear Free Network

"Ohio's Nuclear Watchdog"

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Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

April 22, 2024

TO: Mr. James Lovejoy
DOE EIS document manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
HALEU-EIS@nuclear.energy.gov

RE: Comments on DOE's "Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) ("HALEU DEIS") (DOE/EIS-0559)

Dear Mr. Lovejoy and Employees at the Department of Energy,

My name is Patricia Marida. I am a retired pharmacist from Columbus, Ohio. I am a volunteer coordinator with the Ohio Nuclear Free Network (ONFN).

I will start with two requests.

- **A request that the Comment Period for the Draft EIS be extended by 90 days**. Taking a deep dive into the environmental issues needing to be addressed by the manufacture of this new HALEU fuel – from uranium mining, milling, and enrichment, to fuel fabrication, to transportation, to reactor construction and operation, to nuclear waste containment for the next million years – is a monumental task.
- **Scoping Comments for the EIS cannot be found online.** It is critical that a valid link to these be available and also be easily searchable by the public. These can greatly aid people in researching and making further comments.

073-1

This is a request for the issues below to be studied and incorporated into the Final Environmental Impact Statement (FEIS) that is to be prepared on HALEU.

The Department of Energy (DOE) has taken on the massive task of evaluating environmental effects and challenges from the entire nuclear fuel, reactor/operational, and nuclear waste storage and cleanup enterprises. Such an undertaking could easily take years.

The DOE has taken seven months - since Scoping Comments were received – to come up with a Draft EIS that basically says that the work done in the past is adequate for the congressionally-required EIS. This DEIS ignores new technologies, discoveries, issues, events, and general knowledge that has accumulated in the last 20-50 years. New technology is available for the evaluation of issues such as earthquakes, and evidence is accumulating on the ongoing health problems of workers and the public who have been, and continue to be, exposed to radioactivity and toxins from the nuclear industry. If more radioactivity and toxins continue to be generated, cumulative and generational exposure issues will increase. **The FEIS must include new studies and research on all the issues presented in this document, as well as issues posed in the HALEU EIS Scoping Comments.**

073-2

Government studies directed at the health effects for people living around DOE's nuclear enterprises are basically nonexistent. It has been left to the people suffering illnesses and birth defects from these

073-1 Holding a 45-day comment period complies with Federal NEPA requirements and previous environmental impact statements published by DOE have proved 45-days is generally sufficient for stakeholders to submit comments on Federal projects. DOE-NE accommodated comments submitted past the close of the comment period to the extent practicable and additionally began accepting comments with the publication of the DOE Notice of Availability (NOA) on February 29, 2024, more than a week prior to EPA's publication of the NOA. Therefore, DOE did not feel a formal comment extension was warranted. Please reference the response regarding comment extensions provided in Section 2.7, "NEPA Process," of this CRD. Section 1.2, "DOE Notice of Intent and Opportunity for Comment on EIS Scope," in Volume 1 describes changes made to the EIS based on the scoping comments received. Please also see Section 4.0, "Scoping Comment Summary," of Volume 3 for a summary of comments received during the scoping period.

073-2 Despite not knowing specific locations of facilities or the exact processes or technologies that might be used, DOE incorporated analysis from existing NEPA documents to cover a range of potential construction, operation, and technological scenarios. However, future facility locations, and their associated processes and technologies, would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). With no specific sites or technologies identified, analyses presented in the EIS were high level and no site-specific.

Regarding legacy health impacts, this EIS does not include historical construction and operation impacts, in part, because many of the worst impacts resulted from mid-20th century operations and practices. The Final EIS presents, in Volume 3, Section 2.4, "Legacy Issues," a summary of Draft EIS comments on legacy issues and provides a detailed response acknowledging past issues and the progress that is being made across agencies to address those issues. The significant evolution of practices, regulations, oversight, and reporting result in this information not being determined by HALEU subject matter experts as being representative of future potential environmental consequences, and it was not relied on in predicting the potential environmental consequences associated with the Proposed Action.

Section 1.2, "DOE Notice of Intent and Opportunity for Comment on EIS Scope," in Volume 1 describes changes made to the EIS based on the scoping comments received. Please also see Section 4.0, "Scoping Comment Summary" of Volume 3 for a summary of comments received during the scoping period. Please see the response to Comment 056-7 and the "Analytical Approach" section of the Readers Guide of the EIS for additional information about the analytic approach of this EIS.

Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

enterprises to deal with their personal issues – as well as to organize in opposition to more nuclear operations – operations that will generate increased quantities of radioactive materials, with additional, even exponential, negative health effects. Radioactivity can disturb every tissue and function in the living body, plant or animal. *073-2 (cont'd)*

A comprehensive HALEU EIS would include having public meetings at every applicable nuclear site in the nation, and at all tribal sites where the DOE has unleashed radioactivity. Americans have a right to say what we think of the creation and spreading of radioactivity that is poisoning our communities. As will be pointed out below, a comprehensive study of the effects of the nuclear industry would conclude that the dangers are huge and benefits are nonexistent. *073-3*

Jobs in the nuclear industry are dangerous and far fewer than the number of safe jobs that could be created with the same amount of money in the renewable energy and energy efficiency fields. Investment in nuclear weapons jobs, as well as in nuclear weapons themselves, produces nothing useful, unless one considers the threat of nuclear attack a useful project. *073-4*

By creating electrical energy at a nuclear power plant, society is creating a "forever" waste stream that must be managed and protected from humans and the environment basically forever. That makes this source of electricity extremely expensive if the full cost of waste management was factored into the cost per kilowatt hour. *073-5*

There is no need for HALEU and the continuation of the nuclear industry's "Killing Our Own**". The case is overwhelming that the FEIS should conclude that HALEU operations are too dangerous and expensive to be continued. Choose the No Action Alternative.** *073-6*

- ☢ Everything that radioactivity touches becomes radioactive.
- ☢ There is no completely safe way to handle or store radioactive materials in the present, let alone keep the waste isolated from the biosphere for generations to come. Those of us here today will be gone when generations to come suffer from the effects of what is foolishly being done today. *073-5 (cont'd)*
- ☢ Wall Street will not fund new nuclear reactors. The American public will be the ones who pay for these enterprises, many of which are doomed to fail, just like the NuScale reactor. *073-7*
- ☢ Nuclear power cannot compete with renewables. The cost of new nuclear power is 3-15 times greater than solar or wind, according to the latest report from the investment bank Lazard. *073-8*
- ☢ Nuclear power takes too long to build, while wind and solar are ready to be deployed now.
- ☢ The once-strict demarcation between civilian and military nuclear is a thing of the past. Government officials now brag about dual use, talking like that is a benefit. Civilian is necessary for military, and vice versa, as French President Macron has said. Operations, funding, and personnel overlap. *073-9*
- ☢ It is widely accepted that the nuclear-armed government needs civilian nuclear to be kept alive, lest the funding, impetus, and rationale for nuclear weapons and warfighting be exposed and curtailed.
- ☢ HALEU is about maintaining and expanding the influence of U.S. global power. There is a competition to expand nuclear power to developing nations to create allies in a global battle of economics that could easily end in global nuclear warfare. *073-10*
- ☢ **Now is the time to DeFuse Nuclear Power.** *073-6 (cont'd)*

NOTE: These comments are organized by category with links to documents. Some of these documents may also be sent as PDF attachments.

073-3 As stated in the HALEU EIS, this EIS does not propose selection of specific sites for HALEU fuel cycle facilities. Because the Proposed Action does not include specific site locations, it would not have been feasible for DOE to host in-person public hearings at every potential national location. Instead, DOE opted for virtual meetings to provide opportunities nationally, and DOE hosted an in-person Tribal listening session in Chandler, Arizona. This session was held in coordination with another Tribal conference and was conducted to receive feedback from Tribes historically affected by uranium mining activities. During both the scoping and public comment period, DOE identified physical and digital newspaper outlets with proximity to commercial enrichment, conversion, deconversion, and fuel fabrication sites to distribute information about upcoming meetings and comment mechanisms. These locations included Illinois, Ohio, North Carolina, Idaho, Tennessee, Virginia, and Nebraska. Notices were also distributed to states historically impacted by uranium mining and milling, which included state-wide coverage in Wyoming, Texas, Arizona, New Mexico, Colorado, and Utah. During the public comment period, this notification list was expanded to include notifications near DOE National Laboratories and newspaper distributors specific to Tribal communities. In addition to the previously listed placements, these notices were placed in South Dakota, Washington DC, Oklahoma, California, Nevada, and Washington, as well as regional placements in the Pacific Northwest and several national placements. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. DOE does expect that this subsequent analysis would include assessments of specific locations. See Section 1.3.1 of the EIS for additional information on public outreach.

073-4 Renewable energy technologies would not be a reasonable viable alternative for the HALEU EIS as they would not satisfy the purpose and need. As discussed in Section 1.1 of the HALEU EIS, the purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Thus, additional DOE support for alternative energy (electrical production capabilities) such as wind and solar power, would not meet the identified purpose and need. Therefore, renewable energy alternatives were not considered reasonable alternatives for this EIS. Chapter 2, Section 2.4, further discusses an alternative considered and dismissed from analysis. See also Section 2.2 of this CRD.

All industrial jobs carry some degree of risk, from physical dangers to exposure to hazardous chemicals and radiation. This EIS considered the risk to workers for all

Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

1) HALEU Production at the Portsmouth Nuclear Site in Piketon, Ohio (PORTS):

On March 30, 2021, the Ohio Nuclear Free Network (ONFN) sent a letter to the U.S. Nuclear Regulatory Commission (NRC) requesting a Programmatic EIS and Proliferation Review for Centrus American Centrifuge Operating, which had been given a $115 million unbid contract to produce HALEU at the Portsmouth Nuclear Site in Piketon, Ohio. In August of that same year ONFN and Beyond Nuclear sent a Petition for Review the NRC's approval for 2 Centrus HALEU licenses, complaining that the process was "segmented" into pieces which precluded EIS scrutiny of the larger HALEU development plan. It was noted that doing this with only an EA/FONSI was in violation of NEPA. The two groups asked that a PEIS be done for the two Centrus licenses. Both Centrus and the NRC asked that this request be dismissed, and it was. **A PEIS for HALEU production must be completed and included in the DOE HALEU FEIS.** The PEIS must take into account issues raised in the ONFN flier, Centrus, HALEU and Nuclear Weapons.

Now, after Centrus has started its subsidized HALEU production, and as billions of dollars of public money are being handed out to subsidize new HALEU reactors that cannot compete with renewables – with no guarantee of any final product – the DOE is doing an EIS for HALEU. Interestingly, Centrus cannot complete its designated 2024 production of HALEU. Why not? Because there are no B5 canisters in which to store the HALEU. **DOE's HALEU FEIS must include the manufacture and ultimate suitability of B5 canisters, incorporating features of being inspectable inside and out as well as meeting ASME N3 certification standards.**

073-11

2) Depleted Uranium (DU) at the Portsmouth Nuclear Site in Piketon, Ohio (PORTS):

Depleted uranium hexafluoride (DUF6) waste from the manufacture of HALEU will need to be deconverted into uranium oxides, due to the toxicity and highly reactive nature of DUF6. **The disposal of the waste DUF6 must be accounted for in the HALEU FEIS.** It is apparently being shipped from PORTS to Waste Control Specialists in Texas.

Demand Letter Written to DOE: On 1-23-20, DOE announced an Amended Record of Decision (ROD) allowing DUF4 production at Portsmouth. On Feb. 25, 2020, Ohio Nuclear Free Network (ONFN) attorney Terry Lodge wrote a 16-page letter to DOE stating objections to the amended ROD and petitioning DOE for a Supplemental Final EIS, signed by 36 organizations. Lodge noted that an adequate SEIS must quantify prospective civilian and soldier victims of DU exposure based upon what is now known about pathways of contamination. Future costs of human decontamination, medical treatment, remediation, and disposal of contaminated infrastructure must be identified. Dangers of DU to manufacturing workers, transport workers, the American public, combatants and noncombatants must be assessed. On March 25, 2020, DOE responded with a 5-page letter stating no concern with ONFN objections and denying a need for an SEIS. In this letter DOE states that the DUF4 process is for nuclear weapons.

Interpretations of NEPA indicate that EIS Supplementation is Required. In DOE's Request for Proposals for the original 2004 Environmental Impact Statement, DOE stated that they would supplement the National Environmental Policy Act document if there were a move to produce DUF4. The agency should be held to that promise by the doctrine of judicial estoppel. Where the Federal Government assumes a certain position in a legal proceeding, and succeeds in maintaining that position, it may not thereafter assume a contrary position simply because its interests have changed.

DOE's announcement states that the process would be "purification", which entails the removal of transuranic contaminants from the DUF6. This purification process is a sophisticated industrial process, very expensive, that would clearly warrant a new SEIS for the approval of Line 4 at PORTS.

According to NNSA officials, the DUF6-to-DUF4 conversion line project was paused in March 2021 because of an increase in the project cost estimate from $38 million to $58 million. For projects costing over $50 million, DOE project management processes require that NNSA conduct an analysis of alternatives. Ultimately, because of the expense, the DOE must put the project out for bids, rather than give the contract to Mid-America Conversion, the entity currently operating the deconversion facility at PORTS. As far as the public knows, the process is currently stalled for this and perhaps other reasons.

073-12

of the activities needed to implement the Proposed Action. Information used to assess these occupational health hazards is presented in Vol. 2 of the EIS, as well as Sections 1.3.11, 2.3.2.11, 3.3.11, 4.3.11, and 5.3.11 of a supporting Technical Report (reference "Leidos, 2023" from the HALEU EIS), which summarizes information from many source documents. The HALEU produced as part of the Proposed Action is intended for use in civilian domestic research, development, demonstration, and commercial use. It is anticipated that it would be made available to a consortium of commercial entities for this purpose. None of the activities of the Proposed Action relate to military use of HALEU.

073-5 SNF has a long history of being safely managed and that management is subject to extensive regulatory The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the

Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

The DOE must read and account for issues raised in the ONFN flier, Portsmouth to Make Depleted Uranium for Warfare. **DOE's HALEU EIS must revisit and require an SEIS for the new "fourth line" at PORTS.**

073-12 (cont'd)

3) The Radiation and Public Health Project (RPHP) Epidemiological Report:

The Ohio Nuclear Free Network engaged epidemiologist Joseph Mangano, Executive Director of the Radiation and Public Health Project, to produce two reports on local health near the Portsmouth Nuclear Site. The first, *Health Risk to Local Residents from the Portsmouth Gaseous Diffusion Plant,* reviewed health data from the U.S. Centers for Disease Control and Prevention, and the Ohio Cancer Registry. Pike County's current (2010-2019) cancer incidence rate was the highest of all 88 Ohio counties. In addition, the county's current (2017-2020) premature mortality rate (< age 75) was 85% above the U.S. This gap has significantly worsened since the early 1990s (when it was only 2% higher), and is one of the highest death rates of all 3,100 U.S. counties.

Mangano's second report, *Mortality /Morbidity Study, 7 Counties Downwind of the Portsmouth Nuclear Site*, shows the current premature death rate for the seven-county area closest to Portsmouth was 77% above the U.S., and well above the rate for 7 Appalachian Ohio counties outside the windshed of PORTS. **For the FEIS, the Department of Energy must recognize and address the two Mangano reports and the patterns of radioactive contamination near PORTS, along with patterns of morbidity and mortality before making any decision to proceed with acquisition of HALEU at the site.**

073-13

4) Offsite Radioactivity Found Around the Portsmouth Nuclear Site:

Dr. Michael Ketterer, PhD, analytical chemist and Professor Emeritus of Chemistry and Biochemistry at Northern Arizona University (NAU), 4-24-19: *Investigation of anthropogenic uranium, neptunium, and plutonium in environmental samples near Piketon, Ohio*. Analysis done by Dr. Ketterer at NAU identifies the Portsmouth Nuclear Site as the source of nearby radioactivity.

Listed here are 19 of Dr. Ketterer's Reports, Articles, and Interviews on Radioactive Contamination at PORTS for DOE to review. Slides from Dr. Ketterer's talk in Waverly, Ohio on March 3, 2024, listed in the above document, show his findings of enriched uranium, neptunium, and plutonium offsite.

The DOE brought the Agency for Toxic Substances and Disease Registry (ATSDR) to study public health in the Piketon community. The ATSDR has never done a public health study. The ATSDR's dismissal of Dr. Ketterer's reports by saying they "are not usable" is deceptive. What century does ATSDR think this is?

Dr. Michael Ketterer ATSDR Comments 11-9-23 It is beyond question that emissions of enriched uranium, Tc-99, and transuranics escaped the site boundaries as the X-326 demolition was conducted, and the same can be anticipated during the upcoming demolition of the X-330 and X-333 buildings.

ONFN/Beyond Nuclear HALEU EIS Scoping Comments, asking to include Dr. Ketterer's findings, were ignored. As stated in the paragraph above, **For the FEIS, the Department of Energy must recognize and address patterns of radioactive contamination near PORTS, and specifically those reported by Dr. Ketterer, who has impeccable credentials.**

073-14

5) Uranium Mining and Milling:

Uranium is a radioactive element with a half-life of 4.5 billion years. It breaks down into even more dangerous elements including radium, radon gas, and polonium. **U.S. uranium mining** takes place chiefly in the West, where it has heavily impacted Native American and Latino communities. It has destroyed important archaeological sites.

Open Pit Mining leaves a huge footprint of waste rock piles, exposing radioactivity to the elements and posing huge cleanup challenges. **Underground Mining** threatens aquifers, worker health, and is expensive to remediate. **In-situ Leach Mining** pumps chemically laden water into the ground, bringing up uranium and heavy metals in solution. In-situ mines compromise communities' water supplies by using large amounts of scarce water, leaving chemicals in the ground, and bringing chemicals, heavy metals, and radioactivity to the surface. Disposal of the water contributes significantly to the spread of radioactivity.

Radon and radioactive particulates impact mine workers, their families, and nearby communities. Mining accidents, loss of traditional lands, declining property values, and **public health concerns** plague mining

management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

073-6 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

073-7 The viability of NuScale reactor is outside the scope of this EIS. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on funding for the Proposed Action. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

073-8 Regarding the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Support and funding for nuclear energy versus renewable energy technologies is outside the scope of this EIS. Further The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one

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communities. The U.S. Atomic Weapons Program left over 4,000 abandoned uranium mines, mainly in Colorado and Utah -- over 500 are on Navajo Nation lands. Navajo Nation, U.S. EPA, and state abandoned mine reclamation agencies all have ongoing programs to remediate abandoned uranium mines. But these are few, are progressing slowly, and have questionable methods and results. There are four Uranium Superfund Sites in New Mexico.

See the Good Energy Collective's "*Sustainable and Ethical Uranium Mining: Opportunities and Challenges*".

Rather than copying all the points directly into this document, the Department of Energy must recognize and address the entirety of the issues in ONFN's flier Uranium: Mining and Milling in the FEIS.

073-14 (cont'd)

6) Uranium: Enrichment, Nuclear Fuel Fabrication, and More:

CONVERSION: After uranium has been mined and milled, the "yellowcake" – a mixture of uranium oxides – went to the Honeywell Metropolis Works facility in Metropolis, IL. This facility added fluorine to the uranium, creating uranium hexafluoride (UF6) which can be heated to a gas for enrichment. The process of creating UF6 is known as "conversion." The 1958 facility exposed the community to continuous and increasing UF6 emissions through two ownerships until it was idled in 2018. As the nation's only converter, the crossover between nuclear weapons and power is unmistakable here. A good deal of UF6 is exported.

073-15

ENRICHMENT: Uranium (hexafluoride) is then "enriched" to increase the percentage of fissionable Uranium-235 from less than 1% to between 3-5% for nuclear power and to over 90% for nuclear weapons and submarines. Taxpayers heavily subsidize enrichment for nuclear power, and totally subsidize enrichment for nuclear weapons. **Gaseous Diffusion Enrichment:** The K-25 enrichment plant in Oak Ridge, TN operated from 1945 to 1987. The 2-million-square-foot building has been demolished. Starting in the 1950s, high-enriched uranium was made for nuclear weapons at the Portsmouth (OH) and Paducah (KY) Nuclear Sites. The enormous (100 acres under roof) Portsmouth facility *used as much electricity as New York City* according to the former Atomic Energy Commission. Both facilities later also made low-enriched uranium for reactors. Now closed, tens of billions of public dollars are being spent for cleanup. Cleanup is a misnomer because high-level nuclear waste was brought into both facilities and run through the process buildings, contaminating the entirety of both sites with all manner of radioactive elements including technetium and plutonium and other transuranics. **Centrifuge Enrichment:** The only currently operating uranium enrichment facility in the U.S. is Urenco near Eunice, NM, which produces low-enriched uranium for reactors using centrifuge technology. Centrifuge facilities can easily convert to making high-enriched uranium for weapons. Centrifuge technology was stolen and has spread around the world. The U.S. government is currently promoting and subsidizing the startup of a new High Assay Low Enriched Uranium (HALEU) facility at the Portsmouth Nuclear Site, which can enrich to 25%. The Dept. of Energy (DOE) defines 20% as High Enriched – it is weapons usable. HALEU would fuel yet unbuilt reactors which the government is also almost completely subsidizing. The overlap between civilian and military is conspicuous here. **Laser Enrichment:** The Dept. of Energy (DOE) is negotiating with Global Laser Enrichment to build a laser enrichment facility at the Paducah (KY) Nuclear Site. In 2014 the Kentucky Fish and Wildlife Commission voted to turn over 665 acres of a wildlife management area for this private enterprise. Laser enrichment poses a serious nuclear weapons proliferation risk through its small size and lack of heat signature. Undetectable by satellite, the world would not know what nations have nuclear weapons capability, a serious threat to global stability.

073-16

DOWNBLENDING: Downblending consists of mixing high-enriched uranium from weapons with natural or depleted uranium to make low-enriched fuel for power. Nuclear Fuel Services (NFS) in Erwin, Tennessee has been fined for violations and accidents at its Blended Low-Enriched Uranium project. NFS is the only nuclear facility to be the subject of congressional hearings and to be declared a public health hazard by the Agency for Toxic Substances and Disease Registry. BWXT in Lynchburg, VA, also downblends. Historically, downblending has occurred at Department of Energy (DOE) sites in Oak Ridge, Tennessee and Savannah River, South Carolina.

073-17

FUEL FABRICATION: Major nuclear fuel fabrication facilities are in Erwin, Tenn.; Columbia, S. Carolina; Wilmington, N. Carolina; Richland, Washington; and Lynchburg, Virginia. Uranium oxide is pressed and sintered (baked) at over 3000°F into ceramic pellets. There is a danger of criticality in this process. Columns of pellets are encased (clad) in zirconium alloy metal tubes, creating fuel rods. Multiple

073-18

of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Even with the timeline the commenter identified, nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

073-9 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

073-10 The purpose of the Proposed Action is not the expansion of U.S. global power. Rather, in the Energy Act of 2020, Congress directed DOE to establish and carry

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rods are put together into fuel assemblies. There is considerable variation among fuel assembly designs for different types of reactors. About 27 tons of enriched uranium is used yearly by a 1,000 MWe nuclear reactor.

In air, zirconium alloys are flammable at high temperatures. Their reactivity in water at high temperatures leads to the formation of hydrogen gas. This reaction was responsible for hydrogen explosions at Three Mile Island and in 3 reactors at Fukushima, Japan. The peak fuel cladding temperature set by the NRC, 2,200°F, is too high to ensure public safety, according to citizen arguments before the NRC.

DECONVERSION: The waste product of uranium enrichment is "depleted" uranium hexafluoride (DUF6), which comprises over 99% of the original uranium. DUF6 is not only radioactive, but also highly chemically reactive. Deconversion removes fluorine from DUF6, reducing it to depleted uranium (DU). Mid-America Conversion Services is operating DUF6 deconversion plants at the Portsmouth (OH) and Paducah (KY) Nuclear Sites. The deconversion process is often referred to as conversion, creating confusion between the two. There were 700,000 metric tons of highly reactive DUF6 stored in about 63,000 steel cylinders on the 2 sites. Many are over 60 years old and rusting. Progress on deconversion has been slow. This may be because DOE has a "use" for the DUF6 waste. The Dept. of Energy, without doing the required Environmental Impact Statement, as noted in point # 2, gave Mid-America Conversion a license for a new process that would use the radioactive DUF6 waste to make depleted uranium for nuclear bombs - yet another link between civilian and military nuclear technology.

SHIPPING: Throughout the "Front End", transportation of radioactive materials occurs by road, rail, and barge. Scores of accidents involving radioactive materials have been reported. Cities, towns, and rural areas have been contaminated. Safety planning is critical, but costs local and federal taxpayers millions of dollars.

CLEANUP OF FRONT-END FACILITIES: All the aforementioned activities and industries contaminate air, land, and water with radioactivity and chemical toxins. The U.S. has spent billions but has scarcely begun to deal with "cleanup" of nuclear power's front-end facilities. In addition, cleanup of nuclear weapons facilities and isolating high-level radioactive waste must be accomplished. Future generations will be saddled with these tasks, costs, and immense energy (hopefully from other than carbon) requirements far into the future.

URANIUM RESERVE COMMENTS: ONFN's 10-13-21 Response to DOE "Request for Information Regarding Establishment of the Department of Energy Uranium Reserve Program" signed by 46 organizations.

For the FEIS, the Department of Energy must recognize and address the entirety of the issues in the above Uranium Reserve Comments as well as in ONFN's flier, from the perspective of 2024 Uranium: Enrichment, Nuclear Fuel Fabrication, and More.

7) Nuclear Waste:

In what types of canisters will HALEU fuel be stored?

All nuclear power plants generate highly radioactive spent fuel waste that must be securely stored for thousands of generations (over a million years) to prevent harm to humans, animals, and the environment.

The Canister Problem: In the U.S., nuclear spent fuel waste is stored in dangerously inadequate thin-wall canisters. The welded-shut canisters are vulnerable to cracking, but no technology exists to find or stop cracks to prevent radiological leaks or explosions. The Nuclear Regulatory Commission (NRC) has stated that once cracks start, they can grow through-wall in as little as 16 years. With each canister containing roughly the amount of deadly radiation as was released in the 1986 Chernobyl disaster, the almost 4,000 loaded canisters across the country put us all at risk. These are ticking time bombs.

The NRC makes numerous exemptions to federal safety regulations.

The NRC does not require canisters to meet American Society of Mechanical Engineers (ASME N3) standards for nuclear pressure vessels in storage and transport. ASME N3 certification requirements include approved methods to inspect, maintain and monitor nuclear pressure vessels. ASME certification requires early warning systems to prevent failure of containment, and a method to retrieve the fuel and take a container out of service before failure. The NRC makes exemptions to these requirements.

Welded-shut canisters cannot meet ASME N3 certification standards – even for inspection.

Canisters were first loaded in 1989**,** but as recently as Oct 2018, an NRC engineer admitted to the NRC commissioners that there is no technology to inspect canisters for cracks (only precursors to cracks). They do not have the ability to "detect the flaws" or "understand and characterize the flaws" - see ML18295A698 pp 104-105. A few months later, in March 2019, when canister inspections were required at San Onofre nuclear

073-18 (cont'd)

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out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's responses.

073-11 The Centrus activities cited by the commenter are outside the scope of the present Proposed Action, and as noted by the commenter were subject to a separate NEPA analysis, and issues related to that process are outside the scope of the HALEU EIS. Related to that particular action, Centrus completed delivery of the HALEU for the first phase of the enrichment demonstration project. Regarding commenter's concerns about Type 5B cylinders, these cylinders were used to receive the HALEU produced by Centrus. The Type 5B cylinders meet the requirements of ANSI N14.1-2001, Packaging of Uranium Hexafluoride for Transport. Shortages of containers is expected to be a temporary condition caused by supply chain issues. Delays due to the shortage of containers do not alter the evaluation of impacts presented in the HALEU EIS. The present EIS evaluates the scope of the Proposed Action including analysis of reasonably foreseeable actions.

073-12 Depleted uranium is not a waste. It is a resource being stored for future use as needed. DOE depleted uranium inventory is maintained consistent with all Federal, state, and local requirements. While outside the scope of this EIS, conversion of depleted uranium hexafluoride (DUF6) to depleted uranium oxide (DU oxide) is ongoing at the Portsmouth and Paducah Sites. Construction and operation of these facilities were evaluated in the F*inal Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio, Site (DOE/EIS-0360)* and the *Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky, Site (DOE/EIS-0359)*. The depleted UF6 from the Proposed Action would be a small percentage of that currently being converted at these two sites. HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As

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plant after a loaded canister nearly dropped 18', Edison's Visual Assessment Report admitted, *This is NOT a formal "inspection" or an activity qualified to ASME Sections III, V, XI or otherwise (p. 124).*
A DOE 2019 Gap Analysis report acknowledges many of these concerns and raised the need for near-term data on canister cracking to Priority 1.

The U.S. has no fuel handling facility capable of handling canister fuel repackaging. In other countries, maintainable thick casks are stored inside hardened buildings with an on-site fuel handling facility (hot cell) for inspecting and maintaining both the casks and the fuel inside - and for repackaging the fuel as necessary. The Swiss use thick casks that meet ASME standards and have an onsite hot cell at the Zwilag waste facility. To be able to deal with the fuel inside damaged, deteriorating, or leaking casks or canisters, hot cells like the one at Zwilag will be necessary at every Independent Spent Fuel Storage Installation (ISFSI). These can cost billions of dollars and the United States has none.

A permanent repository remains unlikely. In the 1960s when nuclear plants were first being built, communities were promised the waste would be taken "away". Congress was led to believe that a permanent repository was feasible and in 1983 passed the Nuclear Waste Policy Act (NWPA). The 1987 amended NWPA mandated the DOE to start taking the waste from reactor sites to a repository beginning in 1998. Still (60 years later), no repository site is under consideration. Technical problems for short term safety (never mind the 1-million-year safety requirement) make a permanent geological repository a distant dream and an empty promise.

Issues in the ONFN flier U.S. Nuclear Waste Storage Canisters: Disasters Ready to Happen must be addressed in the FEIS as they would relate to the continued generation of nuclear waste. It is difficult to predict where future new reactors might be located. Each site poses unique problems, which the NRC refuses to acknowledge. In addition, High Burnup Fuel (HBF) (above 3-5% U-235) (up to 10%) burns hotter and longer, is more highly radioactive, and poses much greater safety and storage challenges. HALEU fuel at 20% could exponentially increase those problems and risks. A proposed entirely new type of reactor fuel, GNF2, poses a high risk of fire if the fuel becomes exposed to air.

Due to these problems, and due to the unending task for future generations of isolating the nuclear waste already generated from the biosphere, **DOE must conclude that the case is overwhelming that the FEIS should conclude that nuclear waste is dangerous and too expensive to contain and choose the No Action Alternative.**

073-22 (cont'd)

8) Geologic, Seismic, and Flooding Considerations:

New geological tools have been created in the last decade or so that make it much easier to determine the soils and bedrock beneath an existing or proposed nuclear site, as well as the location of earthquake faults. **In addition to a FEIS for HALEU, the DOE and NRC must re-evaluate existing nuclear sites individually.** Some of these sites are locations where new reactors may be proposed.

The Perry Nuclear Reactor, on the shore of Lake Erie just east of Cleveland, Ohio, is an outstanding example of a reactor in danger – in a location where a nuclear reactor should never have been built. This was known at the time of construction when workers were instructed to keep quiet as they filled the fissure with thousands of tons of concrete.

More recently (11-22-23), geologist Dr. Julie Weatherington-Rice wrote a frightening Declaration on Perry Geological Problems for the Ohio Nuclear Free Network and Beyond Nuclear's Perry Relicensing Petition to Intervene. Worthington-Rice states that the facility is already undergoing structural changes that were not anticipated when it was originally built. At a minimum, Ohio researchers know that the core design calculations were wrong because actual field conditions were not considered. Dr. Worthington-Rice is currently working on an extended update to this declaration.

There is approximately 60 feet of unconsolidated materials under the plant. Any leaks from the wet and dry storage containment areas will be moving through these materials either down to the underlying bedrock or as base flow into Lake Erie. The outdated geotechnical analysis of the Perry site is not predictive of the actual site conditions. The original designs badly misinterpreted the movement of ground water through the soils. Their assumption of matrix movement for contaminants bears little resemblance to what actually is happening at the site. Water and contaminants move predominately if not almost exclusively through the secondary fracturing systems at the site. This transport system can have significant impacts on the structures at the site where the water movement affects buried and hidden structures. This is especially problematic both because of the collection of spent fuel rods and because of the continued releases of tritium into the

073-23

described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

073-13 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory

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environment. The concrete and the structural integrity of construction over the Ohio Shale "fill" could well be compromised.

Old wells and mines provide conduits to transfer contaminants from the surface and near surface to the underlying base flow to the lake and ground water aquifers. In addition, they provide open pathways for the additional upward migration of methane and radon gases from the underlying black Ohio Shale. These threaten explosions and fires, as well as endanger workers at the plant who breathe this air on a continuing basis. There appears to have been no effort to locate old, abandoned oil and gas wells.

It would strongly behoove the Perry plant to take this shoreline erosion geologic hazard into serious consideration and to armor the bluffs at the Lake, fully understanding that **landslides can develop behind the armoring that could dump the entire nuclear complex into Lake Erie.**

Earthquakes in the area appear to be tectonic in nature. They are continuing, increasing in number and strength and should be planned for. Given that they are natural, stronger quakes should be expected. To assume that there will be no earthquakes in the next 20 years that will cause structural failure at the plant is an unsupported gamble. Another series of quakes began in August of this year near Madison and are continuing. At any point in time quakes higher than the plant design can occur.

There is no way to guarantee structural integrity for the next 20 years given the physical limitations of the site. There is no way to fix many of the problems that will or have already developed.

Please see also the ONFN's fact sheet The Perry Nuclear Reactor where more information is available.

Conclusion: The DOE and NRC must not continue to tell the public that a) current nuclear plants are completely safe, b) that problems of the past have been solved so no need to worry about new ventures, or c) analyses done in the past are adequate for the present and future. The NRC must incorporate this information into the FEIS.

073-23 (cont'd)

9) Overlap of Civilian and Military Nuclear and Proliferation of Nuclear Weapons:

Some of this has been addressed above. Originally, the U.S. government regulations/legalese made or attempted to make an important point of separating these two nuclear behemoths. Now it would appear that most pretense of separation is gone, as government officials brag about "dual use".

It is widely presumed that nuclear power is and always has been a front for nuclear weapons. Nuclear power "legitimizes" the nuclear industry, as the benign friend that will make electricity "too cheap to meter". Nuclear engineers no longer had to be creating only death machines.

Almost every part of military and civilian nuclear overlap, up to the actual manufacture of nuclear weapons. Nuclear power plants are needed to provide the plutonium and tritium used in bomb making.

When nuclear power was established, the costs of uranium mining, milling, enrichment, and related industries were immediately transferred from the military budget to the civilian budget.

A civilian nuclear enterprise, or a pretense of one, is necessary to keep the money flowing and to keep and educate a nuclear workforce. Management and funding of nuclear waste from both civilian and military nuclear will ultimately become the responsibility of the public. In reality, taxpayers are paying for that now.

073-24

The weapons proliferation risk with HALEU fuel is almost unparalleled. The fuel can be fairly easily enriched from 19.75% (or 25% for which Centrus is licensed) to 90-95% weapons grade. HALEU will be feedstock for nuclear bombs. Even without further enrichment, HALEU can be used to make a dirty bomb. HALEU will be highly sought-after by the unscrupulous, and the threat of terrorism is real. Legislation is being passed and offices are being set up in a made rush to put HALEU everywhere it can be sold (creating debt that will saddle the poor), *or practically given away* in order to create a dependent ally. To countries where the infrastructure is poor. To countries with troubled economies and restless populations. To countries experiencing the compounding effects of global heating, where maintaining nuclear power cooling is doubly risky. Ukraine, a war zone, wants 20.

Why the impossibly precise figure of 19.75%? Because at 20% enrichment, uranium becomes by definition, Highly Enriched Uranium. And it cannot be (legally) exported.

The DOE must evaluate the threat of nuclear weapons proliferation in depth, far beyond the scope of the comments on this page.

10) The Need for Guards and the Creation of a Police State:

It is not possible to protect a nuclear site from mischief or attack 100% of the time. Antinuclear activists have proven that by sneaking onto military bases and spray painting their wishes for a peaceful world.

073-25

regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. At the portsmouth site, if it were ultimately selected as a HALEU enrichment site, many aspects of the facility operation would be different from past activities. The enrichment process that would be used to support the Proposed Action (gas centrifuge and not gaseous diffusion) is different from that used at the Portsmouth Gaseous Diffusion Plant and the operation would be a commercial operation licensed and regulated by the NRC. An assessment of the affected environments, including health impacts from prior operations, and impacts from future operations at specific locations is not appropriate for this EIS. However, DOE expects such assessment would be included by the relevant regulatory authority in future NEPA analysis for sites identified as potential locations for fuel cycle activities. Issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. Notably, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. For additional information, see Section 2.4, "Legacy," of this CRD.

073-14 DOE acknowledges the occurrence of legacy contamination that has occurred from past uranium recovery and enrichment activities. Please see Section 2.4, "Legacy Issues," of the CRD for additional information on legacy issues and the response to Comment 056-1 for additional information on the analytical approach and impacts analysis for mining and milling in the EIS. Please also refer to Section 3.1, "Uranium Mining and Milling" in Vol. 1 of the Final EIS and 1.3, "Affected Environment and Environmental Consequences," of the Technical Report for further information on potential mining and milling impacts by resource.

073-15 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current

Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

That said, far more armed guards will be needed to prevent misappropriation if HALEU materializes. Taxpayers and ratepayers will absorb the costs. Very few terrorists will be invading solar farms or climbing windmills. As America becomes more militarized and nuclearized, so the population will become more militarized, distrustful of one another, and violent, as is happening in the United States today. U.S. states are crafting laws to make public protest illegal, either outright or by saddling anyone deemed to be an organizer with legal responsibility for acts of anyone who joins the crowd.

The undercutting of democracy is not a listed part of the nuclear fuel chain. But it illustrates the more subtle and unaccounted-for changes in the culture that do not bode well for human cooperation and sustainability.

73-25 (cont'd)

11) April 2, 2024, Report from the General Accounting Office:

GAO-24-106326: Nuclear Power Plants: NRC Should Take Actions to Fully Consider the Potential Effects of Climate Change. While this report addresses the NRC, its recommendations apply to the DOE as well. The GAO makes 3 recommendations: a) address the potential for increased risks to nuclear power plants from climate change; b) develop, finalize, and implement a plan to address any gaps identified in its assessment of existing processes; and c) incorporate climate projections data into relevant processes, including what sources of climate projections data to use and when and how to use climate projections data.

The report is not terribly strong, but backs the necessity for dealing with increasing natural disasters expected into the future.

The earth is at a tipping point for global heating, after which current infrastructure and social structures will be stretched to the breaking point and be in danger of collapse. Humanity relies on a vast network of shipping and exchange to maintain styles of living that are far above subsistence. The fragility of that system was demonstrated by the outbreak of Covid-19.

The DOE needs to address these new challenges in the HALEU FEIS.

73-26

12) The Radiation Exposure Compensation Act (RECA):

The Radiation Exposure Compensation Act has compensated people who were exposed to radioactivity from the Nevada Nuclear Test Site, along with some workers participating in atmospheric testing and uranium miners. Congress failed to reauthorize RECA in 2023, so it is slated to expire June 7.

A new bill that would renew and expand RECA has passed the U.S. senate. Senate Bill 3853 extends RECA for 6 years. S. 3853 would offer first-time compensation to communities impacted by the atomic bomb test in New Mexico, as well as impacted residents of 8 other states and Guam. It also includes additional uranium workers.

This last section is included to stress that nuclear enterprises have harmed a vast swath of people, and the harm will be ongoing even if no more radioactive waste is generated. In Ohio, over $1.3 billion has been paid out in Federal Workers Compensation to employees at the Portsmouth Nuclear Site for illnesses and injuries sustained from working at the site. The true cost is much more than dollars. Quoting Senator Josh Hawley, sponsor of the bill, "We have not done right by those good people … we have turned our back on them. It is time to rebuild these communities, it is time to finish the work in the United States of America, it is time to turn to the men of women who have borne the brunt of the battle."

The DOE needs to address how these harms are to be mitigated in its HALEU FEIS. We are all collateral damage.

73-27

Sincerely,

Pat Marida

Patricia Marida, Coordinator
The Ohio Nuclear Free Network

"Ohio's Nuclear Watchdog"

regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD. Further, the relevant HALEU provisions under the Energy Act of 2020 are focused on HALEU for civilian domestic use. As described in Section 1.0.2 of the HALEU EIS, the Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use, and to make such HALEU available to members of a DOE HALEU consortium by January 1, 2026 (Section 2001 of the Energy Act of 2020 (a)(1); (2)(H) [42 U.S.C. 16281(a)(1); (2)(H)]. Section 2001(a)(2)(D)(v) of the Energy Act of 2020 more specifically focuses on the acquisition of HALEU produced by a commercial entity using enrichment technology and making it available for commercial use or The HALEU production capability and the HALEU that would be produced under the Proposed Action is intended for civilian use, not defense (nuclear weapon) use.

073-16 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

DOE acknowledges the concern over the widescale worldwide development of enrichment technology. While the Centrus facility at Portsmouth is allowed to have small quantities of material enriched up to 25.0% U-235, that is not typical. Centrus' NRC Materials License establishes a limit on Centrus not to input parameters to withdraw material greater than an enrichment of 20.0% weight U-235; however, in recognition of the challenge in achieving 19.75% weight U-235 exactly, an allowance was made permitting Centrus to possess a small quantity of material between 20.0% and 25.0% weight U-235 in the course of cascade performance adjustments.

DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any

In

Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

073-17 Downblending is not a part of the Proposed Action. As discussed in Section 2.4 of the HALEU EIS, downblending of existing stockpiles of HEU was an alternative considered but dismissed from detailed analysis. Since no alternative considers downblending HEU, the impacts of that action are outside the scope of the HALEU EIS. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

073-18 The HALEU EIS identifies fuel fabrication with HALEU as a reasonably foreseeable activity. The fuel fabrication facilities mentioned by the commenter could potentially handle fabrication of HALEU fuel. Other unspecified locations and facilities could ultimately be involved with fabrication of HALEU fuel. The HALEU EIS discusses how much HALEU would be produced at unspecified facilities, as well as some potential fuel forms. Accidents at fuel fabrication facilities are addressed in Section 7.3.12 of the Technical Report that supports the HALEU EIS (Leidos, 2023). Protection of workers and the public is of utmost importance during fuel fabrication and when using the fuel in advanced nuclear reactors. As addressed in the Technical Report, DOE expects that measures to prevent criticality during fuel fabrication would be addressed by facility design and controls implemented by facility operations. Specific fuel designs and fuel performance parameters, such as fuel cladding temperatures, would be considered in the licensing process for an advanced nuclear reactor. Developers of advanced reactors would be able to incorporate lessons learned from previous reactor accidents and include features in the designs that should mitigate or preclude occurrence of accidents such as those involving zirconium and hydrogen. Specific reactor accidents and their consequences are out of scope for this EIS but the EIS considers the generic site parameter envelope and plant parameter envelope that would be considered by the NRC for licensing advanced nuclear reactors.

073-19 Depleted uranium is not a waste. It is a resource being stored for future use as needed. The DOE depleted uranium inventory is maintained consistent with all Federal, state, and local requirements. While outside the scope of this EIS, conversion of depleted uranium hexafluoride (DUF_6) to depleted uranium oxide (DU oxide) is ongoing at the Portsmouth and Paducah Sites. Construction and operation

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of these facilities were evaluated in the *Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio, Site (DOE/EIS-0360)* and the F*inal Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky, Site (DOE/EIS-0359)*. The depleted UF_6 from the Proposed Action would be a small percentage of that currently being converted at these two sites.

073-20 DOE acknowledges the commenter's statement that the transportation of radioactive materials for the fuel cycle currently occurs by truck or rail. Historically, there have been accidents involving these materials, but none has resulted in any wide-spread contamination into the environment. Section A.6 in Volume 2 of the Final EIS, along with its referenced Technical Report (Leidos, 2023), provides detailed analyses of impacts that include both incident-free and accident conditions for activities related to the proposed action. Specifically, Section A.6.3 of the Final EIS summarizes the needed actions and procedures that would be taken to minimize the impact of a transportation accident involving radioactive materials. See Section 2.6, "Transportation," of the CRD for additional information.

073-21 DOE acknowledges your concern about legacy impacts, although legacy impacts are outside the scope of the HALEU EIS. Please reference Section 2.4, "Legacy Issues," of this CRD for more information. Nuclear weapons facilities are likewise, outside the scope of this EIS.

073-22 DOE acknowledges the commenter's opposition to the Proposed Action and preference for the No Action Alternative. SNF has a long history of being safely managed and that management is subject to extensive regulatory requirements. These requirement s address. packaging, transportation, and interim storage. The characteristics of the various potential HALEU fuel assembles and therefore the associated characteristics needed for analytical evaluations cannot be known at this time and not ripe for any NEPA evaluations. When a HALEU fuel assembly design is prepared, the cognizant regulatory authority will perform the NEPA evaluation as part of the licensing and permitting processes. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of

Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage.In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

073-23 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. The HALEU EIS identifies advanced nuclear reactor operation as a reasonably foreseeable activity of the Proposed Action, and reactors are analyzed to the extent practicable in the EIS. However, analysis of the Perry Nuclear Reactor is outside the scope of this EIS. As part of any future reactor licensing and permitting process, the cognizant regulatory authority (primarily NRC) would be expected to conduct a facility specific environmental review. See also Section 2.4, "Legacy Issues," for additional information.

073-24 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial

Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

073-25 The NRC would be the responsible regulatory authority for any HALEU fuel cycle facility that would possess HALEU (enrichment to HALEU enriched in uranium-235 to 10% and above, HALEU deconversion, HALEU storage, HALEU fuel fabrication). The NRC promulgated regulations at 10 C.F.R. Part 37 in 2013 to establish security requirements for the transportation and use of Category I (strategic special nuclear material) and Category II (special nuclear material of moderate strategic significance) radioactive materials. As discussed in Sections 1.0.5, "Background on Current DOE and Commercial HALEU Supply," and 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS, the HALEU that would be produced under the Proposed Action is considered a Category II material. Therefore, these facilities would need to meet the NRC requirements for a facility possessing this Category II material. Facilities that possess category II quantities of special nuclear material (SNM) would need to implement additional security measures beyond those required for category III (special nuclear material of low strategic significance). These measures could include access controls, such as background checks; controlled access area (CAA) portals and vehicle access; escort requirements; random entry and exit searches; alarm stations; security patrols; communication and coordination with law enforcement; and a security equipment maintenance program. The NRC would undergo an additional case-by-case review for HALEU

Commenter No. 73 (cont'd): Patricia Marida, Ohio Nuclear Free Network

facilities to determine the need and extent of supplemental security measures beyond the requirements in the regulations necessary to ensure adequate protection of public health and safety and common defense and security. There are nuclear facilities within the United States that currently are required to meet these security requirements (and the more stringent requirements for Category I material). DOE acknowledges that the widescale deployment of HALEU fuels in U.S. reactors, which could be facilitated by the Proposed Action, does present different proliferation concerns than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE expects that intentional destructive acts (e.g., terroristic acts) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

073-26 Section 4.3.2 of the HALEU EIS identifies observations and projections of climate change in the United States. It acknowledges that there are anticipated future climate change and environmental impacts for regions of the United States that encompass the numerous potential locations of the Proposed Action activities. Due to the large number of activities and potential facilities evaluated in the HALEU EIS, and the uncertainty of the numbers and locations of facilities, specific climate change adaptation measures for each location are not described in the HALEU EIS. However, DOE does expect that site-specific environmental reviews by the relevant regulatory authority would identify climate adaptation measures that would mitigate the effects of climate change on proposed HALEU activities at those locations."

073-27 DOE acknowledges your concern about legacy impacts and compensation for workers, although these topics are outside the scope of the HALEU EIS. Please reference Section 2.4 "Legacy Issues," of this CRD for more information. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

Commenter No. 74: Jan Boudart

E-mail: HALEU-EIS@nuclear.energy.gov

These are the comments of Jan Boudart on the Draft EIS for DOE Activities in Support of Commercial Production of HALEU. I appreciate the opportunity to make recommendations on this project to the DOE.

General comments: The EIS is generally unfriendly to comprehension by lay persons. I consider myself a lay person; yet an examination of the references that are used to create this EIS do not contain the names of any of the experts I know from my years of interest in uranium and its effect on my life, my immediate experience as a consumer of news, popular (and not so popular, but available) science, published health reports, and as a very concerned citizen. I have lived in California, Nevada, Arizona, and Salt Lake City, Utah from 1948 through 1958, had generations of family in California, Nevada, and still have family in Utah.

Now I have friends or acquaintances near many of the places where locations are projected or already exist in the HALEU supply chain. I live in Chicago, but in the late 80s and early 90s was in Metropolis, the location for Honeywell that produces UF6 from yellowcake; and I have followed news stories about nighttime gaseous emissions from that facility. I have friends and acquaintances non of whose work you cite in reference to environmental traces of the presence of radioactive isotopes from present and past uranium activities; legal aspects of where, when and how radiating facilities are located and used; and health and mortality statistics around radiating facilities. *074-1*

Interested and knowledgable parties from the east to west coast, from Washington, South Carolina, Texas, New Mexico and points in between, including Canada could be hired as your consultants.

I highly recommend that the DOE increase the scope of references to include the physicists, biologists, environmental lawyers, biochemists; public health experts, and other experts from outside your circle who have much experience dealing with processing facilities, their remediation (and lack of) and their environmental and health effects.

Without input from people who disagree with you, your EIS is not only one-sided, but almost unbelievable. The most comprehensible example of this fact is how this EIS deals with the "No Action Alternative". No credence is given to the facts of how the biota and humans near a Greenfield site would have been affected by routine emission; unexpected natural phenomena affecting possible new installations on a Greenfield site, like earthquakes and extreme storms; and the presence of emergency planning and first responders in the area; including *074-2*

074-1 DOE recognizes that the subject of the EIS is a complicated matter, and made every effort to make the EIS as comprehensible as possible for the public. The EIS is structured to provide sufficient information in Volume 1 to allow the reader to understand the reason for conducting the environmental analysis, what was being evaluated, and the results of that evaluation. Additional, more detailed information is provided for each of the fuel cycle activities in Volume 2, Appendix A. Additionally, a Technical Report (Leidos, 2023) provides details regarding the information from prior NEPA analyses for fuel cycle facilities from which the information in the EIS is derived. In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. An assessment of the affected environments, including health impacts from prior operations, and impacts from future operations at specific locations is not appropriate for this EIS. However, DOE expects such assessment would be included by the relevant regulatory authority in future NEPA analysis for sites identified as potential locations for fuel cycle activities. It is within these analyses that site-specific assessments regarding the health of surrounding communities, possibly including some of the work the commenter refers to, should be discussed. Issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. However, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. For additional information see Section 2.4, “Legacy Issues,” of this CRD.

074-2 Analysis regarding impacts to ecological resources and public and occupational health in greenfield location scenarios are available in Chapter 3, Affected Environment and Environmental Consequences. Additionally, Section 3.0.2, “Assumptions,” was developed to identify reasonable assumptions about citing HALEU facilities without having known locations. This section assumes citing regulations would likely avoid areas with earthquakes and land subsidence prone locations. The current statement for the No Action Alternative does not reflect

the possibility of armed guards in a place where people were formerly free to roam. Instead, the No Action Alternative is analyzed strictly within the limits of negative effects on National Security and the economics of obtaining HALEU from foreign sources or waiting for it to become profitable in the U.S. .

I quote your own sentence as follows: "Without DOE funding, the development of HALEU production capacity and use in reactor designs and reactors in the United States in the future would be uncertain."[1] This EIS makes this statement without irony, as though HALEU's "… use in reactor designs and reactors in the United States in the future…" were not in jeopardy even **with** DOE funding.

But I have examined other parts of the EIS and have further comments so this ends my general comments.

074-2 (cont'd)

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3. Introduction

Next is footnote 59, which I am quoting here, followed by my comment: "59 Existing facilities that produce uranium are approved to operate under existing NRC licenses, U.S. Department of Interior permits, and/or applicable Federal, state, and local permits and approvals. NEPA or equivalent evaluations for these facilities were previously performed and considered under those licensing, permitting, and approval action decisions. Those NEPA evaluations—the majority of which are EISs and EAs prepared by the NRC—were identified for each of the HALEU fuel cycle activities and were used to characterize the potential environmental consequences associated with the Proposed Action."

(Comment) An example of this would be the Pinyon Plain Mine owned by Nuclear Fuels, LLC which was licensed before the Obama administration declared the area where it exists a national monument. The former EISs and EAs are not sufficient for today. The DOE should do a completely new EIS for this site that includes the effects that climate change-caused extraordinary weather (possible drought) might have on the water supply and mine workers' ability to survive extreme heat in this area among other issues.

074-3

3.10 No action Alternative

The paragraph beginning "This could have adverse impacts…" ignores the fact that climate change is not waiting for the HALEU fuel chain and its use in future NPPs (Nuclear Power Plants). Yet the whole paragraph cites mitigation of climate change as a "reason" not to follow the No Action Alternative. But renewable energy and efficiency, combined with an upgrade in the national transmission

074-4

[1] Draft EIS for DOE Activities in Support of Commercial Production of HALEU, 3.10 No Action Alternative

positive impacts to public and occupational health or ecological aspects of the environment because they would remain unchanged as it relates to the Proposed Action. Additionally, the No Action Alternative does not necessarily mean the establishment of a HALEU commercialization effort wouldn't happen. Instead, it means DOE would not be involved in establishing a commercial HALEU fuel cycle; establishment of a HALEU fuel cycle would be left to industry.

074-3 Performing an EIS for Pinyon Plain Mine falls outside the scope of the HALEU EIS. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

074-4 The No Action Alternative is analyzed to provide a baseline against which the impacts of the Proposed Action could be compared. It is not intended to imply that other actions, such as the ones described by the commenter, would not occur. Regardless of the advances made in other technologies, the Proposed Action, compared to the No Action Alternative, has the potential to reduce greenhouse gas emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now, nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

Commenter No. 74 (cont'd): Jan Boudart

grid would solve this problem in a more timely manner[2] (although it's already very, very late). These suggestions for dealing with Climate Change are certainly not a "No-Action-Alternative" but they would not require any action in creating a supply chain for HALEU. Waiting for HALEU to be produced and fabricated would take way too long.

A reader of these comments can go to 3.10 "No Action Alternative" to see the consequences in not developing the supply chain for HALEU. Such consequences involve possible future needs for HALEU, private funding and where the U.S. would get HALEU if the DOE were not authorized to subsidize it.

074-4 (cont'd)

3.0.1 Assumptions

Assumption: "Impacts associated with facility operations would result from the processes needed to perform the activity (i.e., uranium conversion, enrichment, etc.), not where the activity is being performed."

Comment: Clearly this cannot apply to U-mining. Consider the different environments where various types of mining can take place: Deserts, forests, wetlands, even the ocean depths, should a uranium trove be discovered there. Then consider the different types of mining that may be employed: Underground "pick and shovel" mining, open pit mining, underground in situ mining, above an aquifer considering shallow vs deep aquifers and the chemistry of the aquifers themselves. The people, flora and fauna of each location deserve an analysis of how different procedures will affect them and each venue is worthy of an analysis of its unique characteristics.

As for the procedures after the U is mined, the same criteria apply to transportation from the mine to the mill and the mill itself. Transfer from the mill to conversion, likewise (as with all transportation routes). Conversion probably proceeds without regard to location except that leaks, (as the one from Honeywell) could be more serious in a thickly settled area. Enrichment seems to have changed from "canyon-sized" buildings to a vertical process (membrane to centrifuge). The public knows very little about the change back to enriched yellow cake and the subsequent fabrication of fuel.

074-5

3.1.1 Land Use
&
3.1.2 Visual and Scenic Resources

In these two sections (3.1.1 and 3.1.2) this draft EIS neglects the changes to vegetation caused by clearing of natural or native flora and the timeline for natural restoration. Such could be shortened by attempts to restore native flora

074-6

[2] Mark Z Jacobson, No Miracles Needed, February 2, 2023, Cambridge University Press, ISBN-13 978-1009249546

074-5 The statement has been revised. The intent of the statement was to indicate that the parameters associated with operation of the facility (land usage, water usage, air emissions and liquid effluents, etc.) are dependent upon the activity not the location. Some of the impacts of the construction and operation parameters are affected by the local affected environment. However, the review of multiple NEPA documents from prior existing or planned activities considered the local environments and reached similar assessments of the impact of the facility activities. While the specifics of the impacts would be expected to vary, the magnitude of the expected impacts would typically be expected to be the same for any location. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC or the respective Agreement State--see response to Comment 071-20). With no specific sites identified, analyses were high level and not site-specific. This EIS does not analyze site-specific locations or process/technologies that may be employed by the commercial suppliers.

074-6 Thank you for your comment. The record of decision for this EIS will not result in the selection of specific locations or facilities; therefore, this EIS does not include site-specific measures such as those described, including revegetation efforts and ecological succession considerations for land-clearing activities. However, if the Proposed Action is undertaken and contracts are awarded thereunder, the awardee(s) will be required to apply to and obtain licenses/permits from appropriate regulatory authorities (e.g., the NRC, other Federal agency, or Agreement States) and these regulatory agencies will be required to comply with applicable NEPA requirements or State equivalents. At that time, DOE expects that site-specific environmental analysis would be conducted by the relevant regulatory agency, and that impacts to biological resources will be identified and addressed.

but in my experience such efforts are usually made by volunteer residents of the area and are woefully underfunded. In addition, such efforts might not be successful because native plants often require deep, natural, unimpaired soils. Also the restoration of natural soil fauna, insects and their life cycle in soils, the ability of worms to make their way through loose, oxygenated soil rather than areas that have been packed by thousand-pound vehicles, etc. Once huge machines have been brought to a natural forest, cut the trees, or packed the delicate desert soil, restoration can take generations, if not forever. These changes can be virtually permanent as far has human lifetimes are concerned.

074-6 (cont'd)

This ends my comments on Draft EIS for DOE Activities in Support of Commercial Production of HALEU

Thank you for this opportunity to submit recommendations to the DOE on this project.

Jan Boudart, [redacted]

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Commenter No. 75: Lee Calhoun

From: [redacted]
To: HALEU-EIS
Subject: [EXTERNAL] Comment on Haleu
Date: Monday, April 22, 2024 7:02:25 PM

To whom it mat concern.
This is real simple, please stop subsidizing the nuclear industry. If the industry could stand on its own two feet banks would lend them the money they need and insurance companies would insure nuclear projects. Banks and insurers don't cover the industry because it doesn't have viable business plans. Please stop sending good taxpayer money after the nonviable nuclear industriy.
Thank You,
Lee Calhoun
[redacted]

****
This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.
****

075-1

075-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 76: Terry Lodge

Law Office of
TERRY J. LODGE

[redacted]

[redacted]

April 22, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
HALEU-EIS@nuclear.energy.gov

RE: Comments on DOE's "Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) ("HALEU DEIS") (DOE/EIS-0559)

Dear Mr. Lovejoy:

I'm writing on behalf of three organizations, the Ohio Nuclear-Free Network (ONFN), a nonprofit grassroots advocacy organization in Toledo, Ohio; Beyond Nuclear (BN), a nonprofit advocacy group in Takoma Park, Maryland; and Don't Waste Michigan (DWM), a nonprofit advocacy group in Monroe, Michigan. These organizations collectively represent thousands of members who're concerned about civilian and military development of High-Assay Low-Enriched Uranium (HALEU). HALEU is fueling a suspect nuclear power technology renaissance that has many drawbacks, some of which are detailed below.

OBJECT AND DEMAND EXTENSION TO COMMENT

ONFN, BN and DWM object to the present comment deadline of April 22, 2024. ONFN, BN and DWM cosigned a request delivered to DOE on April 17, 2024 which requested a 90-day extension of the HALEU DEIS comment period. The introduction of HALEU as next-generation reactor fuel is a significant development aimed at inducing the construction of dozens, perhaps hundreds, of commercial nuclear power plants globally. There are competitors emerging to design and sell so-called "Small Modular Reactors" in at least six countries including the United States. The initial 60-day period for public comment on the Draft Environmental Impact Statement is far too short. ONFN, BN and DWM have intentions of identifying and commenting upon additional aspects of the DEIS, but because of time constraints are not able to do so. HALEU is a complicated fuel design which requires immersive learning to be able to comment meaningfully.

076-1

076-1 Holding a 45-day comment period complies with Federal NEPA requirements and previous environmental impact statements published by DOE have proved 45-days is sufficient for stakeholders to submit comments on Federal projects. DOE-NE accommodated comments submitted past the close of the comment period to the extent practicable and additionally began accepting comments with the publication of the DOE Notice of Availability (NOA) on February 29, 2024, more than a week prior to EPA's publication of the NOA. Therefore, DOE did not feel a formal comment extension was warranted. Please reference the response provided in Section 2.7, "NEPA Process," for discussions about comment extensions.

Commenter No. 76 (cont'd): Terry Lodge

DEIS COMMENTS OF OHIO NUCLEAR FREE NETWORK, BEYOND NUCLEAR AND DON'T WASTE MICHIGAN

We offer our comments on DOE's "Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) ("HALEU DEIS") (DOE/EIS-0559) publication of which appeared in the March 7, 2024 Federal Register.[1] We are commenting for purposes of the record for a congressionally-ordered Environmental Impact Statement on HALEU production and availability, and hereby request that our comments be made publicly available. By letter dated July 23, 2023, we delivered scoping comments.

We ask that our DEIS recommendations be studied, expanded, and fully incorporated into the Final Environmental Impact Statement (FEIS) that is to be prepared on HALEU, and remind the Department of Energy of its obligation to publish formal responses to DEIS comments under the National Environmental Policy Act (NEPA).

I. AMERICA'S HALEU FUEL PRODUCTION EFFORTS REQUIRE CUMULATIVE EFFECTS ANALYSIS BECAUSE THEY WILL INCREASE LOST LIVES AND HEALTH

In the Federal Register scoping notice for this proceeding,[2] DOE solicited scoping comments that address:

- Potential effects on public health from exposure to radionuclides under routine . . . scenarios. . . .
- Potential impacts on surface and groundwater, floodplains and wetlands, and on water use and quality.
- Potential impacts on air quality (including climate change) and noise.
- Socioeconomic impacts on potentially affected communities.
- Potential disproportionately high and adverse effects on minority and low-income populations.
- Potential cumulative environmental effects of past, present, and reasonably foreseeable future actions.

Our below statements provide information as to all of those categories.

A. There Is Mounting Scientific Evidence Of Many Civilian Casualties Of Uranium Fuel Manufacture And Enrichment at DOE's Piketon, Ohio Facility

Recent "citizen science" has been putting proof to the proposition that, given the human cost, in terms of lives lost, long-term environmental damage, and public health impairment, America can no longer afford its civilian and military nuclear power and weapons programs.

076-2

[1] https://www.govinfo.gov/content/pkg/FR-2024-03-07/pdf/2024-04799.pdf
[2] 88 Fed. Reg. at p. 36575, www.govinfo.gov/content/pkg/FR-2023-06-05/pdf/2023-11877.pdf

076-2 Cumulative effects are typically evaluated by combining the effects of a proposed action with the effects of other past, present, and reasonably foreseeable actions in the ROI. These other actions include on-site and off-site projects conducted by Federal, state, and local governments, the private sector, or individuals, that are within the ROIs of a proposed action. Due to the large number of activities and potential facilities evaluated in this HALEU EIS and the uncertainty of the numbers and locations of facilities, a cumulative effects analysis for the majority of Proposed Action and related activities is not possible. New or modified HALEU production facilities that would be licensed and subject to additional NEPA or equivalent state evaluation by the NRC, an Agreement State, or other Federal agencies, would be expected to include consideration of cumulative effects. NEPA documentation exists for many of the activities that would be associated with a HALEU fuel cycle, especially for the production of LEU (a necessary step in the enrichment process to produce HALEU). Most, but not all, of those NEPA documents (see Volume 2, Appendix B, *Facility NEPA Documentation*) contain cumulative effects analyses for the specific facilities and locations. Generally, these assessments mirrored the impacts associated with the activity being analyzed in the document. That is, resource areas with SMALL impacts from the proposed activity, tended to have SMALL cumulative impacts. Similarly, so did resource areas with MODERATE or LARGE impacts. However, it is not possible to extrapolate that analysis to sites where no cumulative effects analysis has been performed. Please reference Chapter 4 of the Final EIS for information regarding cumulative impacts associated with the HALEU EIS. See the response to comment 56-7 and the "Analytical Approach" section of the Reader's Guide of the EIS for information on the analytical approach for the HALEU EIS. An assessment of the affected enrivonment, including health impacts of prior operations, at specific locationswould expect to be included in future NEPA analysis for sites identified as potential locations for fuel cycle activities. The remediation of legacy impacts is not within the scope of this EIS. For additional information see Section 2.4, "Legacy Issues," of this CRD.

Around the PORTS facility at Piketon, Ohio, for example, recent chemical sampling of soil and air suggests that there is widespread regional radionuclide contamination, where epidemiological analysis reveals disturbing incidences of cancer among local residents that cannot be explained away.

Present plans to scale up HALEU production will take place at existing, already contaminated nuclear industrial complexes. The new enrichment and/or downblending of radioactive materials projects will thus add to pre-existing radiological contamination and damage being caused to property and people's health and life prospects. Unlike most non-radiological chemicals, radioisotopes can be extremely long-lived, causing contamination as heavy metals with the additional punch of irradiating flesh and making property unusable, and real property uninhabitable.

Take the former Portsmouth (Ohio) Gaseous Diffusion Plant (PORTS), located near Piketon, Ohio. The installation is in the heart of impoverished Appalachian Ohio. Historically, the PORTS complex enriched Uranium for U.S. nuclear weapons and to fuel commercial nuclear reactors.

In May 2019, Zahn's Corner Middle School, located within four miles of PORTS, was permanently closed and slated for demolition after local officials reported enriched uranium and transuranic radionuclides were detected in dust inside the school. These significant radioactive contaminants were scientifically identified by Michael Ketterer, Ph.D., professor emeritus at Northern Arizona University.[3]

Dr. Ketterer has since documented that additional residences have been irradiated by airborne radionuclides from PORTS, including a private house in Lucasville, Ohio, 10 miles from the PORTS site.[4] At Lucasville, Dr. Ketterer found unusual levels of U-235 and U-234 in dust samples from the home's attic, at concentrations elevated to a factor of 3.4 compared with natural levels.

The Zahn's Middle School revelations, together with Dr. Ketterer's ongoing investigative forensic work, caused DOE to fund a larger sampling campaign, the Human Health Risk Assessment, across an area within a six-mile radius of PORTS. The study was overseen by the Pike County General Health District and Scioto Valley-Piketon Area Council of Governments**.** Following two years of gathering samples, the consultants Solutient and Auxier announced in their report[5] the presence of radioactive contamination in the form of Americium, multiple isotopes of Uranium, Neptunium, Technetium and Plutonium at, or exceeding, the screening level on hundreds of sampled sites within the six-mile radius. The most frequently noted radionuclides appear to be Technetium-99 (Te-99) and Plutonium-238 (Pu-238).[6] Both of these are irrefutably tied to the arduous history of Uranium enrichment and downblending at PORTS.

[3] https://www.ans.org/news/article-4481/report-links-u235-found-in-ohio-home-to-portsmouth/
[4] https://www.scribd.com/document/604959982/Ketterer-Lawson-18Oct2022-002
[5] https://drive.google.com/file/d/1rGW5SoanpDzcokutQFKHk-nuNPG74e-9/view
[6] https://drive.google.com/file/d/1zGDeRfkIbvUYh_MfwvedjRMDNMAkWumZ/view, Slides 11-18, 32.

076-2 (cont'd)

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Commenter No. 76 (cont'd): Terry Lodge

Independent epidemiologist Joseph Mangano has analyzed public health and mortality data for Pike County, where PORTS is located, and for six Ohio counties adjoining Pike County. In August 2022, Mr. Mangano determined that Pike County's cancer incidence from 2010-2019 was 15% higher than the U.S. rate, and the highest rate of all 88 Ohio counties.[7] Mr. Mangano also found that in the 1950s when PORTS opened, county cancer mortality was 12% below the U.S. national rate. He also determined that *by 1993, Pike County surpassed the U.S. cancer rate and that the largest gap (+32.8%) occurred in 2019-2020*. Mr. Mangano verified that in 2009-2020, the cancer death rate in the county exceeded the U.S. rate by about 50% for all age groups, except for persons over age 75 (0.5% below the U.S. average); that county all-cause mortality was <5% above the U.S. in the 1980s and early 1990s. *By 2019-2020, however, the county rate was 42.3% greater. Finally, among persons 0-74, all-cause mortality in Pike County soared to 85.0% above the U.S. in 2017-2020, nearly twice that of the nation.*[8]

In his second, 2023, analysis, Mr. Mangano evaluated the public health and mortality data of six Ohio counties downwind of PORTS. He compared those Ohio counties, which adjoin Pike and are downwind of PORTS, with six Ohio counties further from the plant ("control" counties). All 13 counties had similar population densities, racial/ethnic composition; and rates of poverty, education, unemployment, and health insurance. PORTS is located in the generally-impoverished Appalachian region within Ohio.

Mr. Mangano found that in the late 1990s, cancer incidence in both multi-county areas was 0.4% below the U.S. rate, but that by 2015-2019, the study counties' rate exceeded the U.S. by 17.5%, versus 8.8% in control counties.[9] In the 1970s, infant death rates were slightly above the U.S. in both areas (+4.4% and +1.6%). However, by 1999-2020, the excesses were +31.9% (study) and +9.9% (control). In the early 1970s, all-cause mortality rates in both areas were slightly above the U.S. But by 2017-2021, mortality in the study counties far exceeded the rate in the U.S. and control counties.[10] Mangano opined that:

> The large and growing gaps between study and control areas indicate that socio-economic factors – which have likely undergone similar changes over time - cannot account for most of the high rates near PORTS. Nevertheless, with 13,138 "excess" premature deaths (under age 75) in the seven study counties since 1974, a thorough evaluation of contamination from PORTS and the plant's current decommissioning process are in order.[11]

DEIS Treatment of the Foregoing Concerns

The above comments respecting past cumulative radiation contamination of the PORTS site and downwind offsite regions by PORTS activities were proffered by ONFN, BN and DWM at the scoping stage. However, they are not addressed at all in the DEIS.

076-2 (cont'd)

[7] https://radiation.org/rphp-report-finds-soaring-death-rate-near-ohio-uranium-plant/
[8] *Id.*
[9] All citations in this paragraph are from Mangano's report, https://radiation.org/wp-content/uploads/2023/06/Portsmouth-2nd-report-final.pdf
[10] See table at p. 1 of Mangano's 2023 report, revealing stunning variations.
[11] *Id*.

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These concerns must be identified and addressed in the DEIS. Worker and public health concerns are proper subjects to be addressed in the HALEU EIS. DOE identified "potential effects on public health from exposure to radionuclides under routine . . . scenarios" in the Federal Register notice for this proceeding.[12] DOE also solicited information on "potential impacts on surface and groundwater, floodplains and wetlands, and on water use and quality;" "potential impacts on air quality;" "potential disproportionately high and adverse effects on minority and low-income populations;" and "potential cumulative environmental effects of past, present, and reasonably foreseeable future actions" in the notice.[13]

The DOE Nuclear Safety Program mission at PORTS "is to support the design, construction, operation, and deactivation and decommissioning of the . . . Portsmouth nuclear facilities in a manner that ensures adequate protection of workers, the public, and the environment."[14] To that end, DOE and its contractors are to "[e]nsure operations are conducted such that: Individual members of the public are provided a level of protection from risks associated with DOE operations that equates to no significant additional risk to life and health than that to which members of the general population are normally exposed. . . ."[15]

Indeed, NEPA requires cumulative effects analysis of the HALEU burden when added to past and present radioactive contamination. The continuing presence, movement and effects of past long-lasting radioactive toxins, plus the toxic effects of the current activities at PORTS must be added to the projected effects of HALEU production. A significant current activity at PORTS that is emitting radionuclides is a Depleted Uranium Product Line added to Depleted Uranium (DU) solidification plant at PORTS to manufacture components for nuclear weapons internals,[16] and it obviously must be accounted for in a cumulative effects analysis wherein HALEU is introduced into the local environment at PORTS.

NEPA requires an agency to evaluate "'cumulative impacts' along with the direct and indirect impacts of a proposed action." *TOMAC, Taxpayers of Michigan Against Casinos v. Norton*, 433 F.3d 852, 864 (D.C. Cir. 2006) (citing *Grand Canyon Tr. v. FAA*, 290 F.3d 339, 345 (D.C. Cir. 2002)). A cumulative impact is "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. § 1508.7. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." *Id.* § 1508.7. A NEPA cumulative impacts analysis must include discussion of "other actions — past, present, and proposed, and reasonably foreseeable — that have had or are expected to have impacts in the same area," "the impacts or expected impacts from these other actions," and "the overall impact that can be expected if the individual impacts are allowed to accumulate." *Grand Canyon Tr.*, 290 F.3d at 345.

076-2 (cont'd)

[12] 88 Fed. Reg. at p. 36575.
[13] *Id.*
[14] https://www.energy.gov/pppo/nuclear-safety
[15] *Id.*
[16] At Piketon, components are made with a DU-niobium alloy to provide parts for the DOE's nuclear weapons stockpile modernization program. https://www.gao.gov/assets/gao-21-16.pdf

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B. There Is Mounting Scientific Evidence Of Many Civilian Casualties Of Uranium Fuel Downblending And Associated Activities At DOE Contractor Nuclear Fuel Services At Erwin, Tennessee

A similar story to PORTS is unfolding in Erwin, Tennessee. Erwin is a town of 5,000 in impoverished Appalachian eastern Tennessee. The town adjoins the site of Nuclear Fuel Services (NFS), a 66-year-old nuclear fuel fabrication plant under DOE contract that has manufactured high-enriched Uranium (HEU) fuel for the nuclear Navy and also has down-blended nuclear weapons material for nuclear fuel. Because of its extensive historic role in downblending HEU, NFS is being considered in the DEIS for a HALEU fuel cycle facility.[17]

NFS admits there are traces of plutonium and other radionuclides routinely released from the plant into the adjoining Nolichucky River.[18] And Dr. Michael Ketterer has scientifically traced plutonium from NFS for a distance of 95 miles down the Nolichucky.[19] As in the Ohio study, Ketterer has tested attic dust samples, including from an Erwin residence located roughly a mile from the NFS plant, which yielded evidence of enriched Uranium contamination traceable to NFS.[20]

Epidemiologist Joseph Mangano undertook a recent analysis of public health and mortality data for Unicoi County, Tennessee, where NFS is located. He determined that until the late 1990s, Unicoi County's all-cause death rate was about equal to the nation's. The Unicoi County rate has risen since, and is now 44% above the U.S. rate.[21] The premature mortality rate since the 1990s has risen to 61% above the U.S. rate. Since the early 1990s, Unicoi County's cancer death rate is now 39% above the U.S. rate. Mangano suggests that this trend was "unexpected" and that "No change in demographics, health behaviors, or access to medical care that could account for this trend is obvious, so further investigation is merited. . . . One potential cause is the continued operation of NFS and the greater accumulation of radioactivity in local air, water, and food."

DEIS Treatment of the Foregoing Concerns

The above comments respecting past cumulative radiation spreading from the Nuclear Fuel Services site at Erwin downwind were proffered by ONFN, BN and DWM at the scoping stage. However, they are not addressed at all in the DEIS.

But these concerns must be identified and addressed in the DEIS. Worker and public health concerns are proper subjects to be addressed under NEPA. DOE solicited information on "potential effects on public health from exposure to radionuclides under routine . . . scenarios" in the Federal Register notice for this proceeding.[22] DOE also seeks information on "potential impacts on surface and groundwater, floodplains and wetlands, and on water use and quality;"

[17] DEIS pp. 1-12, A-70.
[18] https://www.nrc.gov/materials/fuel-cycle-fac/fuel-fab/nfs-faqs.html#3d
[19] "Declaration of Michael Ketter, Ph.D.," ADAMS No. ML22319A251, p. 3, https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML22319A251
[20] https://www.erwinrecord.net/news/local/nuclear-regulatory-commission-hears-from-concerned-citizens-during-nfs-performance-presentation/article_29fe9ef0-f64e-11ed-9d66-e31d2668d3ea.html
[21] https://radiation.org/wp-content/uploads/2023/06/Nuclear-Fuel-Services-w-ltrhead.pdf
[22] 88 Fed. Reg. at p. 36575.

076-2 (cont'd)

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"potential impacts on air quality;" "potential disproportionately high and adverse effects on minority and low-income populations;" and "potential cumulative environmental effects of past, present, and reasonably foreseeable future actions" in the notice.[23]

Respecting the NFS facility in Erwin, the NRC has legal responsibility under the Atomic Energy Act to consider whether when granting a license, such an action "would be inimical to the common defense and security of the United States or would constitute an unreasonable risk to the health and safety of the public." 42 U.S.C. § 2077(c)(2) and § 2099.28. NEPA requires a cumulative impacts analysis of the potentially community-wide contamination of Erwin in light of the "reasonableness" of the risks at NFS.

Indeed, NEPA requires cumulative effects analysis of the HALEU burden when added to past and present radioactive contamination. The continuing presence, movement and effects of past long-lasting radioactive toxins, plus the toxic effects of the current activities at PORTS must be added to the projected effects of HALEU production. A significant current activity at PORTS that is emitting radionuclides is a Depleted Uranium Product Line added to Depleted Uranium (DU) solidification plant at PORTS to manufacture components for nuclear weapons internals,[24] and it obviously must be accounted for in a cumulative effects analysis wherein HALEU is introduced into the local environment at PORTS.

NEPA requires an agency to evaluate "'cumulative impacts' along with the direct and indirect impacts of a proposed action." *TOMAC, Taxpayers of Michigan Against Casinos v. Norton*, 433 F.3d 852, 864 (D.C. Cir. 2006) (citing *Grand Canyon Tr. v. FAA*, 290 F.3d 339, 345 (D.C. Cir. 2002)). A cumulative impact is "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. § 1508.7. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." *Id.* § 1508.7. A NEPA cumulative impacts analysis must include discussion of "other actions — past, present, and proposed, and reasonably foreseeable — that have had or are expected to have impacts in the same area," "the impacts or expected impacts from these other actions," and "the overall impact that can be expected if the individual impacts are allowed to accumulate." *Grand Canyon Tr.*, 290 F.3d at 345.

076-2 (cont'd)

II. HALEU INVITES NUCLEAR WEAPONS PROLIFERATION

A. Expanded Global Use of HALEU Would Exacerbate Security And Proliferation Risks

In the Federal Register notice of this rulemaking,[25] DOE solicited scoping comments on the topic of "Compliance with all applicable Federal, state, and local statutes and regulations, and with international agreements, and required Federal and state environmental permits, consultations, and notifications."

076-3

[23] *Id.*
[24] At Piketon, components are made with a DU-niobium alloy to provide parts for the DOE's nuclear weapons stockpile modernization program. https://www.gao.gov/assets/gao-21-16.pdf
[25] 88 Fed. Reg. at p. 36575.

076-3 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 76 (cont'd): Terry Lodge

As discussed below, there are international agreements and federal laws requiring compliance, particularly as to nuclear proliferation potential, and they must be addressed in the Draft EIS.

Despite HALEU's U-235 enrichment just below 20%, it is possible to use it directly in a nuclear explosive device. DOE admits that in the DEIS. HALEU's less-attractive material form does present greater technical challenges to be made into a nuclear bomb than does high-enriched Uranium (HEU). The Brookhaven National Laboratory noted in a 2021 study that "HALEU can be converted into direct use material more quickly than LEU and possibly make it more difficult for the IAEA to detect undeclared material or facilities. . . ."[26] That "make[s] HALEU a new category of unirradiated uranium with its own timeliness and quantity goals."[27]

The Brookhaven Laboratory study also concluded that "[t]he widespread use of HALEU will have safeguards impacts because: (1) For a given enrichment capacity, the time to produce weapons grade HEU is much shorter when starting with HALEU; and (2) A clandestine enrichment facility could be smaller and therefore more difficult to detect if HALEU were used as the feedstock."[28] The study continues: "Consequently, the widespread use of HALEU could lead the IAEA to reconsider the necessary frequency and intensity of safeguards activities for States and facilities using HALEU, as compared to States and facilities using LEU."[29]

Brookhaven determined that at the 19.75% enrichment level, less work is needed to turn HALEU into weapons. Specifically, "When starting with 19.95% enriched HALEU, the number of SWUs needed to produce a kilogram of 90% enriched HEU is three to four times less than when starting with traditional LEU,"[30] which means that for a given enrichment capacity, the time to produce weapons grade HEU is much shorter when starting with HALEU; and a clandestine enrichment facility could be smaller and therefore more difficult to detect if HALEU were used as the feedstock.[31]

In its report, "Merits and Viability of Different Nuclear Fuel Cycles and Technology Options and the Waste Aspects of Advanced Nuclear Reactors,"[32] the National Academies of Science Committee charged with preparing the report took very seriously the risks of nuclear materials theft and terrorism involving HALEU:

> **Finding 19**: *Expanding the global use of high-assay low-enriched uranium (HALEU) would potentially exacerbate proliferation and security risks because of the potentially greater attractiveness of this material for nuclear weapons compared with the*

076-3 (cont'd)

[26] "Implications for IAEA Safeguards of Widespread HALEU Use," Brookhaven National Laboratory (2021), p. 5, https://www.hsdl.org/c/view?docid=863093
[27] *Id.*
[28] *Id.* at p. 1.
[29] *Id.*
[30] *Id.* at p. 2.
[31] *Id.* at p. 3.
[32] National Academies of Sciences, Engineering, and Medicine, Washington, DC: The National Academies Press. https://doi.org/10.17226/26500.

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low-enriched uranium used in light water reactors. The increased number of sites using and states producing this material could provide more opportunity for diversion by state or nonstate actors.

> **Recommendation M:** *The U.S. National Nuclear Security Administration, in coordination with the U.S. Department of Energy's Office of Nuclear Energy, should assess proliferation and security risks associated with high-assay low-enriched uranium (HALEU) and its potential for expanded global use*. In parallel, the U.S. government should foster an international effort, which could be facilitated by the International Atomic Energy Agency, to examine and address these risks.

Finding 20: All of the advanced reactor fuel cycles will require rigorous measures for safeguards and security commensurate with the potential risks they pose. Issues requiring special attention include the following:

• *Material accountancy* (*i.e.,* tracking and quantification) is more difficult for molten salt and pebble-bed technologies than for reactor systems that use stationary solid fuels because of the technical challenges in performing measurements with online fuel and bulk-handling facilities. Containment and surveillance will also be more challenging to implement for these types of reactors. Thorium/uranium-233 fuel cycles require development of safeguards technology because of the large number of variants in their systems. Moreover, safeguards tailored to traditional uranium/plutonium fuel cycles are not applicable to these systems.

• *Fuel cycles involving reprocessing and separation of fissile material that could be weapons usable pose greater proliferation and terrorism risks* than the once-through uranium fuel cycle with direct disposal of spent fuel, as the separated fissile material would not be uniformly mixed with highly radioactive fission products. Separated, potentially weapons-usable materials could include fissionable materials other than the "traditional" special nuclear materials of highly enriched uranium, plutonium, and uranium-233. Thus, for these closed fuel cycles, specific safeguard technologies will likely be required to meet the International Atomic Energy Agency's goal of timely detection.

> **Recommendation N:** The U.S. government should support the International Atomic Energy Agency's (IAEA's) development and application of effective safeguards for advanced reactor technologies by authorizing, via the U.S. interagency process, IAEA access through the eligible facilities list, especially to those advanced reactor systems for which the IAEA does not currently have safeguards experience. Developers of these types of advanced reactors and fuel cycle facilities should provide facility information to the IAEA to help with integration of safeguards considerations into the design process.
>
> **Recommendation O**: *The U.S. Nuclear Regulatory Commission should initiate a rulemaking to address the security and material accounting measures for high-assay low-enriched uranium (HALEU)* and other attractive nuclear materials that may be present in advanced reactor fuel cycles.[33]

DEIS Treatment of the Foregoing Concerns

076-3 (cont'd)

[33] *Id.*, § 6.1, pp. 191-192 (Emphasis added).

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DOE did note the recitation of the National Academies' findings and recommendations.[34] But without conducting any assessment, DOE "expects that any new assessment would affirm the conclusion that the merits of the use of HALEU outweigh the nonproliferation risks involved. That conclusion itself is consistent with the original delineation between LEU and HEU made in the 1950s by the Atomic Energy Commission and ultimately implemented by the IAEA."[35]

But it isn't the 1950s anymore. Enrichment via laser technology can take place in a very compact manner and without an atmospheric heat signature. In 2024 parlance, taking into account state-of-the-art technology in assessing weapons proliferation potential is surely "reasonable forecasting" and not a "crystal ball" inquiry. *See, e.g., Scientists' Inst. for Pub. Info., Inc. v. U.S. Atomic Energy Comm'n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973). New advanced reactors and fuel cycle facilities – including reactor types that can be refueled while continuing to operate, and reactors that are essentially reprocessing facilities – must be assessed in line with enormously sophisticated means of theft of nuclear material and sabotage of nuclear cycle infrastructure.

DOE offers the vacuous reassurance that "NNSA is also promoting the chance to consider safeguards and security by design for new reactors, which will incorporate safeguards and security features into the design as early as possible to achieve a risk and cost informed nonproliferation benefit, thereby avoiding costly retrofits down the line. This engineering approach can include fuel cycle facilities as well."[36] A plan to have a plan is not an answer. NNSA's good intentions, unaccompanied by firm, written, enforceable policies and evidence of serious enforcement culture is completely unsatisfactory.

B. The Proliferation Potential Of Globalized SMR Marketing

1. Mounting Pressure For Global Trafficking In Next-Generation Reactors

There is growing pressure to amend the Atomic Energy Act to allow U.S. companies to compete globally in sales of so-called "advanced reactors" and "SMRs." Economists forecast growth and speculation in this country for decades to come, predicting a $295 billion U.S. SMR industry by 2043.[37]

Globalization of nuclear power will bring what are, in a major sense, nuclear weapons proliferation machines, within the reach of authoritarians and autocratic governmental leaders. Saudi Arabia's prince bin Salman has expressed his intention that Saudi Arabia will develop an "Arab bomb" if he believes Iran is also building weapons.[38] Saudi Arabia is close to completion of an experimental reactor and is considering having a Korean firm build its first SMR.[39] The

076-3 (cont'd)

[34] DEIS pp. 3-34 to 3-35.
[35] *Id*. p. 3-35.
[36] *Id.* p. 3-36.
[37] https://www.idtechex.com/en/research-report/nuclear-small-modular-reactors-smrs-2023-2043/934
[38] https://www.reuters.com/article/us-saudi-iran-nuclear/saudi-crown-prince-says-will-develop-nuclear-bomb-if-iran-does-cbs-tv-idUSKCN1GR1MN
[39] https://www.neimagazine.com/news/newssaudi-arabia-to-use-domestic-uranium-for-nuclear-development-10529986

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United Arab Emirates, another authoritarian state, has a four-unit reactor complex nearing completion, totaling 5.6 GWe. Unit 1 of the complex, at Barakah, was connected to the grid in August 2020, followed by unit 2 in September 2021 and unit 3 in October 2022.[40]

The concept of high-stakes global trafficking in nuclear power plant construction, operation, disposing of nuclear waste and fuel will inevitably spawn the spread of nuclear weapons well beyond the existing nine countries worldwide which currently possess them. Because some of those plants will be designed, built and/or operated by U.S. firms, and the fuel is likely in many instances to be HALEU, DOE must assess the weapons proliferation aspects of HALEU fuel in the Draft EIS.

The NEPA statute, 42 U.S.C. § 4332(2)(f), expressly requires Federal agencies to recognize the worldwide and long-range character of environmental problems and to support appropriate initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of humankind's world environment. Further, Executive Order 12114[41] requires Federal officials to consider major Federal actions significantly affecting the environment of the global commons as well as the environments of foreign nations. Nuclear weapons proliferation, and with it the risk of nuclear war, poses an obvious potential for causing severe decline in the quality of humankind's world environment.

DEIS Treatment of the Foregoing Concerns

DOE did note the recitation of the National Academies' findings and recommendations.[42] But without conducting any assessment, DOE "expects that any new assessment would affirm the conclusion that the merits of the use of HALEU outweigh the nonproliferation risks involved. That conclusion itself is consistent with the original delineation between LEU and HEU made in the 1950s by the Atomic Energy Commission and ultimately implemented by the IAEA."[43]

That dogmatic position reflects poor judgment and a deliberate indifference to the unprecedented notion of putting commercial nuclear power proliferation machines within the reach of smaller, but troublingly sometimes authoritarian, nations. The export of SMR technologies that tend to conceal the volumes and whereabouts of reprocessable spent fuel both as fuel and a nuclear weapons source is an unprecedented step. Enrichment of legally-obtained HALEU surreptitiously via laser technology can take place in a very compact manner and without an atmospheric heat signature. Global sales of Small Modular Reactors to dozens of countries with varying levels of nuclear power culture, regulatory rigor, and disinclination to honor the Nonproliferation Treaty will present an oversight challenge to the IAEA like no other. The DOE must stop denying that globalized nuclear power trafficking will globalize HALEU availability in very significant ways. There could even be downward pressure on HALEU pricing. World-wide sales of HALEU will pose the risk of superficially lawful black market trafficking. In these circumstances, assessing weapons proliferation potential is surely

076-3 (cont'd)

[40] https://world-nuclear.org/information-library/country-profiles/countries-t-z/united-arab-emirates.aspx
[41] https://www.energy.gov/nepa/downloads/executive-order-12114-environmental-effects-ab road-major-federal-actions
[42] DEIS pp. 3-34 to 3-35.
[43] *Id*. p. 3-35.

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"reasonable forecasting" and not a "crystal ball" inquiry. *See, e.g., Scientists' Inst. for Pub. Info., Inc. v. U.S. Atomic Energy Comm'n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973). The rapid expansion of international marketing of advanced reactors that will use HALEU means an unheard-of volume of nuclear power transactions with legal trappings that are a subterfuge for producing nuclear weapons.

DOE offers the vacuous reassurance that "NNSA is also promoting the chance to consider safeguards and security by design for new reactors, which will incorporate safeguards and security features into the design as early as possible to achieve a risk and cost informed nonproliferation benefit, thereby avoiding costly retrofits down the line. This engineering approach can include fuel cycle facilities as well."[44] A plan to have a plan is not an answer. NNSA's good intentions, unaccompanied by firm, written, enforceable policies and evidence of serious enforcement culture is completely unsatisfactory.

2. *Possible Banking And Concealment Of Unobligated Uranium*

Another relevant aspect of a weapons proliferation assessment was mentioned in DOE's public notice of scoping, that "initial sources of uranium to meet the requirements of the [HALEU Availability Program] could be existing DOE stockpiles of highly enriched uranium (HEU) that would be processed or down-blended into HALEU (*e.g.*, activities conducted outside of the Proposed Action and that are covered by separate existing or pending NEPA documentation)."[45] This raises the prospect that "unobligated" Uranium, which carries no "obligation" restricting it to be used only for nonmilitary purposes, might be concealed or stored/banked under civilian U.S. HALEU management. It is possible that the National Nuclear Security Administration (NNSA) of DOE might stockpile military Uranium to evade disclosure and scrutiny under the NPT and other treaties.

Notably, SRS-Watch, another commenter in the scoping stage of this proceeding, requested review under NEPA "if any new HALEU production facility would be utilized to process unobligated uranium into fuel to use in TVA reactors that produce tritium for use in U.S. nuclear weapons."[46] ONFN, BN and DWM join SRS-Watch's request and demand under NEPA that the pathways to hiding unobligated HEU (or HALEU down-blended from unobligated HEU) be identified and the possibility be addressed in the EIS. It is obligatory that this be done to fulfill the NEPA aim of informed public decision-making under NEPA. *Robertson v. Methow Valley Citizens Council,* 490 U.S. 332, 349-50 (1989).

DEIS Treatment of the Foregoing Concerns

DOE did not address this concern at all even though ONFN, BN and DWM raised it at the scoping stage. It is arbitrary and unacceptable for DOE to decline to identify and consider this serious military ambiguity loophole in the regulation of the HALEU fuel cycle. Without conducting any assessment, DOE "expects that any new assessment would affirm the conclusion

076-3 (cont'd)

[44] *Id.* p. 3-36.
[45] 88 Fed. Reg. at p. 36573.
[46] *See* Savannah River Site Watch comments made earlier in this scoping proceeding.

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that the merits of the use of HALEU outweigh the nonproliferation risks involved."[47] This is naive and unverified. Besides, the United States, as are all other nations of the world, has been ordered by the International Court of Justice to work toward complete abolition of nuclear weapons inventories.[48] The fact of that legal obligation, alone, underscores that the concerns of ONFN, DWM and BN must be addressed in the EIS.

DOE offers the vacuous reassurance that "NNSA is also promoting the chance to consider safeguards and security by design for new reactors, which will incorporate safeguards and security features into the design as early as possible to achieve a risk and cost informed nonproliferation benefit, thereby avoiding costly retrofits down the line. This engineering approach can include fuel cycle facilities as well."[49] A plan to have a plan is not an answer. NNSA's good intentions, unaccompanied by firm, written, enforceable policies and evidence of serious enforcement culture is completely unsatisfactory.

3. *NEPA and AEA Interpretations Support A Broad Proliferation Assessment Now*

Nuclear weapons proliferation and security issues have been encompassed within NEPA environmental impact assessments and statements since the inception of NEPA. See *Scientists' Institute for Public Information, Inc. v. Atomic Energy Commission*, 481 F.2d 1079 (D.C. Cir. 1973) (AEC required to prepare a programmatic environmental impact statement (PEIS) on the Liquid Metal Fast Breeder Reactor (LMFBR) Program in part to address nonproliferation and terrorism in the subsequent LMFBR EIS). In *West Michigan Environmental Action Council v. AEC*, Dkt . No . G-58-73 (W.D. Mich. 1974), the AEC settled the litigation by preparing a generic Programmatic EIS on plutonium recycling, which later came to be known as the "Generic Environmental Statement on Mixed Oxide Fuel" (GESMO), No. RM-50-1.

In 2009, DOE tried to address issues of nuclear nonproliferation in its "Draft Global Nuclear Energy Partnership Programmatic Environmental Impact Statement" (GNEP PEIS, DOE/EIS-0396) by relying on a separate "Nonproliferation Impact Assessment: Companion to the Global Nuclear Energy Partnership Programmatic Environmental Impact Statement," prepared by the Office of Nonproliferation and International Security of the National Nuclear Security Administration (NNSA). This artificial separation of the NEPA discussions was challenged in the public comments phase. Subsequently, DOE published the "Draft Nonproliferation Impact Assessment: Companion to the Global Nuclear Energy Partnership Programmatic Environmental Impact Statement," DOE 2008.

NEPA's requirement that environmental effects be identified and disclosed has been

076-3 (cont'd)

[47] DEIS pp. 3-34 to 3-35.
[48] 1996 Advisory Opinion of the International Court of Justice, which enjoined all signatories that NPT's Article VI requirement to negotiate nuclear disarmament in good faith "goes beyond that of a mere obligation of conduct; the obligation involved here is an obligation to achieve a precise result, nuclear disarmament in all its aspects by adopting a particular course of conduct, namely, the pursuit of negotiations on the matter in good faith." https://www.law.umich.edu/facultyhome/drwcasebook/Documents/Documents/Advisory%20Opinion,%201996%20I.C.J.%20226.pdf at p. 32.
[49] *Id.* p. 3-36.

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followed and applied to programs involving storage of nuclear missiles,[50] the testing of nuclear weapons,[51] the destruction of excess nuclear weapons pursuant to a treaty,[52] and transporting chemical weapons.[53] The U.S. Air Force has compiled environmental impact statements as part of its compliance with the Strategic Arms Reduction Treaty II commitments to dismantle missile launching facilities.[54] The Air Force's Global Strike Command recently assessed under NEPA whether updating of the United States' 400 nuclear missile launch silos meets the requirements of the Nuclear Posture Review (NPR), the Nuclear Non-Proliferation Treaty (NPT), the New Strategic Arms Reduction Treaty (New START), and the Comprehensive Test Ban Treaty.[55] In its 1995 "Record of Decision: Tritium Supply and Recycling Programmatic Environmental Impact Statement," DOE, while producing a Programmatic Environmental Impact Statement for the Strategic Arms Reduction Treaty II Protocol, determined that "it was necessary to reevaluate the Reconfiguration Program to insure that alternatives which reflected requirements of a greatly downsized nuclear weapons stockpile would be assessed in the PEIS."[56]

In its 1999 "Consolidated Record of Decision for Tritium Supply and Recycling," DOE discussed at length the nonproliferation policy implications of using civil commercial light water reactors to produce tritium used in creating nuclear weapons triggers.[57] In its "Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex,"[58] DOE analyzed the implications that various production activities at the agency's Y-12 nuclear weapons facility might have on United States' compliance with the Nuclear Non-Proliferation Treaty.

The point of developing a nuclear weapons nonproliferation analysis as part of the HALEU Environmental Impact Statement is to ensure that DOE decisions in a world increasingly rife with HALEU production and utilization will conform to nuclear weapons nonproliferation goals.

III. HALEU GREATLY INCREASES SECURITY RISKS IN NEXT-GENERATION REACTORS

076-3 (cont'd)

[50] *See, e.g., Concerned About Trident v. Rumsfeld*, 555 F.2d 817 (D.C. Cir. 1976); *Weinberger v. Cath. Action of Hawai'i,* 454 U.S. 139 (1981).

[51] *See Comm. for Nuclear Resp., Inc. v. Seaborg*, 463 F.2d 783 (D.C. Cir. 1971).

[52] *See, e.g.*, U.S. Dep't of the Army, "Environmental Assessment for the Proposed Elimination of Intermediate-Range and Shorter-Range Missiles Pursuant to the INF Treaty" (1988); Corps of Engineers, Dep't of the Army, "Pershing Missiles, Elimination, Pueblo, Co., et al.: Finding of No Significant Impact," 53 Fed. Reg. 6189 (March 1, 1988).

[53] *See Greenpeace USA v. Stone*, 748 F. Supp. 749, 758-61 (D. Haw. 1990) (NEPA did not apply to a presidential agreement with West Germany to transport nerve gas to a Pacific atoll for destruction but suggesting the impact statement may be needed for actions taken abroad that affect this country or where there is a total lack of environmental assessment).

[54] https://apps.dtic.mil/sti/pdfs/ADA414685.pdf

[55] "Draft Environmental Impact Statement for the Ground Based Strategic Deterrent Deployment and Minuteman III Decommissioning and Disposal," https://drive.google.com/file/d/1aKCcvEq92PdKShP5qWzIxrvwNN9P7zo7/view, at pp.1-5 to 1-7.

[56] 63 Fed. Reg. 63878 (December 12, 1995).

[57] 64 Fed. Reg. 26369, 26373-26374 (May 14, 1999).

[58] https://www.energy.gov/sites/prod/files/EIS-0387-FEIS-Summary-2011.pdf, pp. S-14 through S-16.

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The following inventory of proposed reactor designs that would be fueled with HALEU must be investigated under NEPA. There are areas of concern regarding the implementation of inspections and regulations by the International Atomic Energy Agency, and U.S. Nuclear Regulatory Commission (NRC) safeguards requirements, under the Nuclear Nonproliferation Treaty (NPT), to which the U.S. has been a signatory for 55 years.[59]

Ramping up production of HALEU will increase the potential for malevolent acts using radioactive or nuclear materials by substate actors. *Radiological terrorism* is an act that would lead to dispersal of radioactive materials, such as sabotage of a nuclear reactor, whereas *nuclear terrorism* is the theft of a nuclear weapon or the fissionable materials that could be used in making improvised nuclear explosive devices.

Clearly, HALEU is much more desirable to thieves, terrorists and weapons proliferators than the 5%-enriched fuel in today's commercial atomic power reactors.

The National Academies Committee observed that "The IAEA has only had limited experience safeguarding fast reactors, and none at all with such designs as the Natrium reactor, which uses high-assay low-enriched uranium (HALEU)–based metallic fuel. . . . Similarly, the IAEA has had little opportunity historically to demonstrate safeguards approaches at the few pebble-bed high-temperature gas-cooled reactors that have operated. . . . Notably, molten salt–fueled reactors are completely unexplored territory for IAEA safeguards."[60]

A. Sodium-Cooled Reactors

The Natrium and ARC-100 reactors (TerraPower and ARC Clean Technology, respectively), as well as the Oklo Aurora microreactor, are all descendants to some degree of the Experimental Breeder Reactor (EBR)-II. Factors that affect their proliferation risks compared with the once-through cycle of light water reactors are the types and quantities of nuclear material in their fresh and spent fuels, and the potential diversion and misuse pathways for obtaining weapon-usable material throughout the fuel cycle.

The 345-MWe Natrium demonstrator reactor will initially use nuclear fuel with an average enrichment of 18.5% HALEU. Later, larger-scale versions supposedly will use lower-enriched fuel, below 10%. As a pool-type sodium-cooled fast reactor, there is a spent fuel storage area within the reactor vessel, where spent fuel discharges are first sent for cooling for up to 3 years before they are removed from the reactor vessel, cleaned of sodium, and either transferred to a water-filled spent fuel storage pool outside of the vessel or loaded into a dry canister and stored. With sodium pool–type reactors, the fuel's location within the vessel and the opacity of the sodium limit direct visual inspection, for safeguards purposes. And depending on the reactor

076-3 (cont'd)

[59] The NPT is codified as a federal statute at 22 U.S.C. § 3201 *et. seq.* The NRC's safeguards requirements are found generally at 10 CFR Part 73, aimed at preventing sabotage, theft and weapons proliferation.

[60] *Id.*, § 6.3.1.1, p. 204.

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design and fueling strategy, the Natrium reactor's spent fuel could contain significant plutonium and residual U-235, which over time could require increased safeguards and security measures.[61]

Both the ARC-100 and the Aurora sodium-cooled designs also plan to use HALEU, but they differ from Natrium in that they would use a single-batch core with a 20-year cycle length instead of periodic refueling cycles. This comprises both advantages and disadvantages for safeguards. Reduced core access and reduced refueling frequency makes misuse of the facility and diversion of spent fuel much more difficult at reactors with sealed, long-life cores. But despite their small size, these reactors will require substantial quantities of HALEU to achieve criticality.[62] Based on a planned burnup of 1%, the 1.5-MWe Aurora will require several MT (metric tons) of HALEU assemblies with enrichments of up to 19.75% — greatly exceeding the NRC's minimum quantity to be treated as Category II nuclear material.[63]

Depending on the dose rate during irradiation, the Aurora fuel may require Category II security not only before the reactor starts operation, but also at times during operation and after shutdown. It could require an on-site security force to ensure prompt response measures should adversaries attempt "gross theft" of HALEU — especially given plans for deployment in remote locations where off-site local law enforcement response may be slow or insufficient. The plutonium in the Aurora spent fuel would also drive an enhanced level of needed protection.[64]

Even the scrap metal stream associated with fabricating HALEU fuel raises concerns of theft and illegal trafficking. The throughput of an industrial-scale fuel fabrication facility capable of supplying 1 GWe for Natrium reactors would be on the order of 6.4 MT of HALEU per year (taking into account total scrap generation), and would therefore require NRC Category II security to address the risk of "gross theft" of low-enriched uranium.[65]

B. Pebble-Bed Reactors

Pebble-bed reactors fueled by HALEU include the Xe-100 high-temperature gas-cooled reactor (HTGR) and the Kairos fluoride-cooled high-temperature reactor. Their fuel would be graphite pebbles containing TRISO fuel particles. The fuel kernels for both reactor designs consist of UCO (uranium-carbon-oxygen), with equilibrium average uranium enrichments of 15.5 percent for the Xe-100 (Mulder, 2021) and 19.55 percent for Kairos (Blandford and Peterson, 2021).[66] Pebble-bed reactors do not necessarily require HALEU, but can also use stronger forms of low-enriched Uranium (LEU+), below 10%. The use of HALEU will affect both international security and domestic material accounting and security requirements. The risks will be partly offset by the large numbers of "pebbles" needed to acquire weapons-relevant quantities of material, as well as the lack of methods for reprocessing TRISO fuel.[67] On a

076-3 (cont'd)

[61] *Id.*, § 6.3.1.1, p. 205.
[62] *Id.*, § 6.3.1.2, p. 206.
[63] Category II for NRC purposes is defined as 10,000 grams or more of U-235 in the form of Uranium enriched to 10% or more, but less than 20%.
[64] Merits and Viability of Different Nuclear Fuel Cycles, § 6.3.1.2, p. 206.
[65] *Id.*, § 6.3.1.3, p. 207.
[66] *Id.*, § 6.3.2, p. 207.
[67] *Id.*

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single-reactor-unit basis, there is not great concern, but the total material inventory at a multi-unit site, including fresh and spent fuel storage, can be substantial.

More worrisome is that pebble-bed reactors would be refueled while actively operating, which is a major obstacle to adequate safeguards. Online-refueled reactors such as Canadian deuterium uranium reactors (CANDUs) require greater safeguards resources than batch-refueled reactors such as LWRs, because fuel would not be loaded and unloaded while the reactor is held in discrete shutdown periods when inspectors typically conduct a physical inventory. Pebble-beds present greater challenges than CANDUs for material accountancy because of the large number of pebbles containing fissionable material, the portability of these individual items, and the nearly continuous fueling and refueling cycles.[68]

The potential for undetected diversion or misuse exists if the system of accounting for nuclear material lacks integrity. The volume of material at a multi-reactor site could cause large problems. In addition to each reactor module, inspectors would need to verify the inventories of fresh fuel and spent fuel storage areas. Each Xe-100 core (which would contain approximately 224,000 pebbles when fully fueled) is planned to be fully replaced approximately every 3.5 years, so a nuclear plant containing four reactor modules (the Xe-100 standard design to produce 320 MWe) will receive 10 million fresh fuel pebbles over a 40-year plant lifetime (plus replacements for damaged pebbles).[69] Pebbles cannot be assigned a unique identifier over their operational lives.[70] Pebble counting alone will be insufficient to accurately determine and verify nuclear material inventories at reactors.[71] The anticipated use of multiple modules at a single site compounds the accounting problems.

C. Once-Through Molten Salt Reactors

The challenges of accounting for fuel in once-through molten salt–fueled reactors using LEU will be even greater than for pebble-bed reactors. While individual pebbles can at least be counted, the special nuclear material in a salt-fueled reactor constantly flows through and outside of the core. For safeguards purposes, molten salt–fueled reactors should be seen as bulk-handling facilities similar to reprocessing plants. Such reactors include the Terrestrial Energy IMSR (integral molten salt reactor) and ThorCon thermal-spectrum designs, and the fast-spectrum MCFR (molten chloride fast reactor).[72]

It will be quite difficult to accurately and timely account for radioactive material at bulk-handling reactors. The total inventory cannot be measured directly during operation, but only extrapolated through such means as sampling and destructive assay, non-destructive assay, and process monitoring. The very large throughput of special nuclear material of an industrial-scale bulk-handling facility, coupled with technical limits on the accuracy and precision of measurement techniques, can fail to account for a lot of material.[73] Also, the nuclear material

[68] *Id.*
[69] *Id.*, § 6.3.2, p. 208.
[70] *Id.*
[71] *Id.*
[72] *Id.*, § 6.3.3, p. 210.
[73] *Id.*.

076-3 (cont'd)

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inventory within a salt-fueled reactor changes over time. It may not be possible to precisely estimate the reactor inventory as a function of time, even if inputs and outputs are accurately measured.[74] Further, molten salt reactors are designed to separate protactinium-233 to maximize uranium-233 production. Separated Uranium-233 would be comparable to plutonium in its attractiveness for weapons.[75]

DEIS Treatment of the Foregoing Concerns

Although the DEIS does discuss in some detail the range of SMR and advanced reactor types that are expected to rely on HALEU fuel, there is no discussion specific to each reactor type of the weapons proliferation possibilities inherent in their designs and processes. Without conducting any assessment, DOE "expects that any new assessment would affirm the conclusion that the merits of the use of HALEU outweigh the nonproliferation risks involved."[76] The sentence immediately following DOE's unsupported conclusion states, ''That conclusion itself is consistent with the original delineation between LEU and HEU made in the 1950s by the Atomic Energy Commission and ultimately implemented by the IAEA.'' A very great deal has changed in the world since the original LEU-HEU delineation made in the 1950's, including the technical means of enriching uranium without leaving a heat signature, the decreased volume of weapons material required for individual nuclear weapons, the propensity of non-nuclear weapons states under the Nuclear Nonproliferation Treaty to acquire The Bomb, and the profusion of non-state actors interested in acquiring nuclear weapons material for dirty bombs.. All four of the NPT non-complying countries – Israel, India, Pakistan and North Korea – have built their weapons programs since the 1950s. DOE's affirmation of a 65-year old decision, which was made more than a decade before the passage of NEPA, is contemporaneously naive and unverified by any data or anecdotal explanation within the pages of the DEIS.

Further, the United States, along with all other nations of the world, has been ordered by the International Court of Justice to work toward complete abolition of nuclear weapons inventories.[77] The existence of that mandatory legal obligation, alone, only underscores that the nuclear weapons proliferation implications posed by the historically unprecedented move to develop and use HALEU fuel must be thoroughly addressed in the Final EIS.

Thank you very much.

076-3 (cont'd)

[74] *Id.*, § 6.3.3, p. 211.
[75] *Id.*, § 6.3.3.2, p. 212.
[76] DEIS p. 3-35.
[77] 1996 Advisory Opinion of the International Court of Justice, which enjoined all signatories that NPT's Article VI requirement to negotiate nuclear disarmament in good faith "goes beyond that of a mere obligation of conduct; the obligation involved here is an obligation to achieve a precise result, nuclear disarmament in all its aspects by adopting a particular course of conduct, namely, the pursuit of negotiations on the matter in good faith." https://www.law.umich.edu/facultyhome/drwcasebook/Documents/Documents/Advisory%20Opinion,%201996%20I.C.J.%20226.pdf at p. 32.

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Very truly yours,

/s/ Terry J. Lodge
Terry J. Lodge, Esq.
Counsel for Ohio Nuclear-Free Network,
Beyond Nuclear and Don't Waste Michigan

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Commenter No. 77: Kalene Walker

From: Kale Walker
To: HALEU-EIS; Lovejoy, James B
Subject: [EXTERNAL] DOE/EIS–0559 Draft EIS for HALEU
Date: Tuesday, April 23, 2024 12:09:13 AM
Attachments: HALEU CANISTER COMMENT 042224.pdf

Thank you for considering this comment on the DOE's Draft EIS for HALEU.
Kalene Walker

****
This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.

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Commenter No. 77 (cont'd): Kalene Walker

Public comment on the Department of Energy's (DOE) HALEU
Draft Environmental Impact Statement (DEIS) – DOE's proposed action to facilitate the establishment of commercial HALEU (super high burnup) fuel production.

The DEIS inadequately and misleadingly assesses the environmental impacts of the HALEU fuel chain. Among many of its deficiencies, the DEIS disregards the magnitude of the national nuclear waste storage problem, and DOE's role in either solving the problem or making it worse. The DEIS, for example, misleading claims that NRC's NUREG 2157 sufficiently addresses spent fuel storage issues, and the added burden of HALEU spent fuel. ***077-1***

Also, importantly, the document fails to acknowledge serious environmental impacts of long-lived radioactive contamination that has and continues to adversely affect human and environmental health around many fuel-chain related facilities. The DEIS relies primarily on earlier NEPA documents and ignores the historical record, studies, reports, data, and "lessons learned" from 60+ years of low enriched uranium (LEU) fuel chain processes. This leaves the public to expect more of the same – contaminated sites and communities. Please consider the following: ***077-2***

I. THE WASTE

Until a nuclear waste solution is in place, super high burnup (HALEU) fuel should not be made or used. HALEU is financially motivated - not a safety consideration. Without HALEU (super high burnup fuel), small modular and advanced reactors are not cost effective. Super high burnup fuel can burn much longer in reactors (and create "less" spent fuel waste), but **the waste is much more radioactive and increases risks and instabilities in storage**. Existing high burnup fuel can cause fuel degradation and damage. Super high burnup fuel will only make unresolved storage problems worse.

Research showing that fuel can become brittle and fragile in storage (and regulations) suggests that fuel must be inspected before transport. But it is impossible to inspect fuel in welded-shut canisters without a fuel handling (hot cell) facility. No hot cell facility large enough to handle canister fuel transfer exists in the U.S.

Furthermore, the waste is stored in dangerously inadequate thin canisters that do not meet basic safety standards. The canisters can crack, but no technology exists to find, repair, or stop cracks. ***077-1 (cont'd)***

In NUREG 2157, the only DEIS reference regarding waste, the NRC assumes that canisters will last for 100 years. That assumption assumed that conditions for cracking won't start for 80 years. But in …year conditions for crack initiation were found in two-year-old Holtec canisters at Diablo Canyon. https://sanonofresafety.files.wordpress.com/2011/11/diablocanyonscc-2014-10-23.pdf And in 2018, it was discovered that Holtec canisters are unavoidably scraped and gouged against carbon steel as they are lowered into storage. https://sanonofresafety.org/2019/05/16/all-holtec-nuclear-waste-thin-wall-canisters-likely-damaged-from-inferior-holtec-downloading-systems/**Carbon embedded in stainless steel may have initiated pit corrosion cracking on many Holtec canisters across the country – on day one of storage**. The NRC has stated that once cracks start, they can grow through wall in as little as 16 years. **Let's do the math; this is a now problem.**
…and each canister contains about a Chernobyl disaster worth of radiation.

Why hasn't the DOE acknowledged and solved this problem yet?

077-1 SNF has a long history of being safely managed and that management is subject to extensive regulatory requirements. These requirements address packaging, transportation, and interim storage. The characteristics of the various potential HALEU fuel assembles and therefore the associated characteristics needed for analytical evaluations cannot be known at this time and not ripe for any NEPA evaluations. When a HALEU fuel assembly design is prepared, the cognizant regulatory authority will perform the NEPA evaluation as part of the licensing and permitting processes. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A,

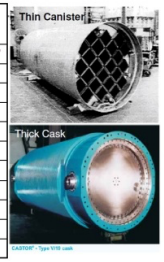
Commenter No. 77 (cont'd): Kalene Walker

Before canister failure (and before transport) the fuel must be repackaged into thick bolted casks that meet **ASME N3** standards for nuclear pressure vessels in storage and transport. Also, thick bolted casks can meet Monitored Retrievable Storage (MRS) requirements as mandated in the Nuclear Waste Policy Act (NWPA). Unlike welded canisters, bolted casks are designed so both the container, and the fuel inside can be inspected, monitored and maintained **to prevent radiological disaster**. Visit SanOnofreSafety.org for more information.

077-1 (cont'd)

Ten reasons to use thick nuclear waste storage casks

Safety Features	Thin canisters	Thick casks
1. Thick walls	1/2"- 5/8"	10"- 19.75"
2. Won't crack		√
3. Ability to repair, replace seals		√
4. Ability to inspect (inside & out)		√
5. Monitor system prevents leaks		√
6. ASME container certification		√
7. Defense in depth (redundancy)		√
8. Store in concrete building		√
9. Gamma & neutron protection	Need overpack	√
10. Transportable w/o add'l cask		√
Market leader	U.S.	World



SanOnofreSafety.org

Recommendation:
In a report to congress as mandated in legislation referenced in the DEIS, the DOE should inform congress of the canister problem and solution outlined above.
The Swiss have a system worth modeling. https://sanonofresafety.org/swiss/
The DOE should advise that funding for advanced fuel or advanced reactor be redirected for the immediate development of a hot cell (Dry Transfer Facility as identified in NUREG 2157), the acquisition of thick bolted casks, and the research, technology, and training to open canisters and inspect fuel. Also, canisters emptied of fuel can be inspected for any micro-crack development.
The first canisters to be opened should be ones containing damaged high burnup fuel. Fuel inspection should include evaluation of both uranium hydrides and zirconium hydrides.

This could facilitate the DOE closing the knowledge gaps in their own 2019 Gap Analysis Report, where high priority gaps include canister corrosion, monitoring, assessment of consequence of canister failure, fuel transfer options, cladding hydrides, hydride reorientation, cladding embrittlement and fuel transfer options. https://www.osti.gov/servlets/purl/1592862

077-1 (cont'd)

4,000 canisters are loaded across the country, yet not one has ever been opened.
To have no actual data on canistered commercial fuel is egregiously irresponsible.
Those of us in reactor communities, are becoming aware and outraged at being victims of the nuclear "assumptions" and "probability" gamble.

Please address AND SOLVE this problem before it's too late.

Environmental Consequences Supporting Information. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

077-2 The EIS does address the American Centrifuge Plant and the potential impacts associated with use of that facility as part of the Proposed Action. However, site-specific locations are not being analyzed in the EIS. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental consultation requirements.

The assessments of the Proposed Action in the EIS for HALEU commercialization focus on past NEPA analysis for facilities which subject matter experts evaluated to determine the potential impact of future operations in support of the Proposed Action, including health and safety. DOE acknowledges that issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. (Section A.3.3.8 has been added to Volume 2 of the EIS discussing some of the legacy issues associated with the Portsmouth site.) However, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include an assessments of the existing affected environments, including health impacts from prior operations at specific locations, including, if applicable, the Portsmouth site. For additional information see Section 2.4, "Legacy Issues," of this CRD.

Commenter No. 77 (cont'd): Kalene Walker

II. ENVIRONMENTAL IMPACTS AND IMPLICATIONS
Not Covered In The DEIS

The DEIS lacks acknowledgement of communities and environments negatively impacted by radiation exposure from nuclear fuel chain facilities and/or nuclear reactors. Most glaringly for this uranium enrichment DEIS is the omission of the Piketon, Ohio where uranium enrichment and extreme off-site contamination has occurred for decades. Ironically, Piketon is also where HALEU uranium enrichment has already started. A true EIS would include a comprehensive assessment of information including the following:

TV News compilation **Fallout Investigation series** (30 min); Includes the closure of Zahn's Middle School due to radioactive contamination, the death of a 20 year old fence line resident due to a rare leukemia, radiation sampling in local attics and findings, and other extreme off site environmental impacts from the Piketon PORTS Uranium enrichment facility.
https://youtu.be/mNEIcYhSas0?si=T3xZ0qa8jB8guP4_

As of April 2024, the Department of Labor has paid out $1,307,728,994 for compensation and medical bills to workers at the Piketon uranium enrichment facility.
https://www.dol.gov/owcp/energy/regs/compliance/statistics/WebPages/PORTSMOUTH_GDP.htm

Letter to Pike Count Health Commissioner Matt Brewster with data and analysis identifying the Piketon facility as the source of offsite Neptunium-237 04-28-21
https://docs.google.com/document/d/13Zfe-3TQKIA3H-DPXEIO-ewA4YJZXpat3p8ShHxzds0/

Investigation of anthropogenic uranium, neptunium, and plutonium in environmental samples near Piketon, Ohio. 04-27-19 https://drive.google.com/file/d/1aB1tGb_miJVz-UH2uCjKxgES8Dw2sXIV/view

Unreviewed Disposal Question Evaluation: Disposal of the Portsmouth Gaseous Diffusion Plant Spent Trap Media and Other Uranium Bearing Particulate Wastes at the Area 5 Radioactive Waste Management Site, Nevada National Security Site, Nye County, Nevada July 2018

In a 2018 study, Mission Support and Test Services, LLC (DOE/NV/03624—0188) characterized the radionuclides present in spent trap media from PORTS that was destined for disposal at the Area 5 Radioactive Waste Management Site in Nevada. These waste materials are described on page 7 as ***"...consists of trap media, including activated aluminum oxide (Al2O3), sodium fluoride (NaF), and magnesium fluoride (MgF2) used to remove chemical constituents from GDP process gases. The waste stream also includes particulate matter collected during decommissioning and disassembly of GDP process equipment along with associated dry active waste and floor sweepings."*** Table 1 of the DOE/NV/03624— 0188 document lists average activities of radioisotopes in the PORTS spent trap media. **It is evident that ^{237}Np (along with ^{99}Tc and other long-lived radionuclides) would have been present in recent air emissions from PORTS, indicating the obvious PORTS origin of the ^{237}Np detected in a 2017 air sample collected at DOE's A41A monitoring station at Zahn's Corner.** https://www.osti.gov/servlets/purl/1576992

077-2 (cont'd)

Response side of this page intentionally left blank.

Commenter No. 77 (cont'd): Kalene Walker

Auxier Human Health Risk Assessment (HHRA) Report for the DOE May 2023
Findings include; Radiation released from Piketon facility may have **worrisome affects in the local food chain, such as backyard gardens**. (Pike County Health District Dropbox)
https://www.dropbox.com/s/07xbjmq4ggfm4ei/HHRA%20Report%20Final%20Report%20-%20Pike%20County%20Community%20-%2020230522.pdf?e=1&dl=0

Mortality /Morbidity Study, 7 Counties Downwind of the Portsmouth Nuclear Site 06-10-23
https://radiation.org/wp-content/uploads/2023/06/Portsmouth-2nd-report-final.pdf

Radiation and Public Health Project (RPHP) Pike County Study 08-15-22
Health Risk to Local Residents from the Portsmouth Gaseous Diffusion Plant
https://drive.google.com/file/d/1M6VBRCngoSpqwo0bXFsn-XO9QQXNXoqn/view

Regarding the Nuclear Fuel Solutions (NFS) fuel facility in Erwin, Tennessee, referenced in the DEIS as a potential site for Cat2 fuel making; Again, local community residents, suspicious that their health problems were related to the nuclear facility, contracted independent radiological assessments. Findings included; ***Plutonium from the MOX process in sediments of the Linear Trail Pond, and MOX contaminated sediment was found as far downstream as Davy Crockett Lake (20-30 miles downriver). Enriched uranium released from NFS travels in dissolved form in the Nolichucky River as far downstream as Douglas Lake (95 miles downriver).***

The history of abandoned uranium mines in the southwest and the clearly adverse environmental and public health affects is also relevant to the fuel chain EIS.
Again, it's the all-too-common tragic story of local residents ongoing cry for site cleanup - while suffering with tragic cancers (often multigenerational) and other health problems.
The recently activated Canyon / Pinyon Plain uranium mine near the Grand Canyon is also extremely concerning to many.
https://www.grandcanyontrust.org/blog/uranium-mine-starts-new-grand-canyon-monument

077-2 (cont'd)

There is little experience with new proposed Gen 4 reactors such as Terra Power's sodium reactor, but what has occurred in the past is worrisome. **Consider the Sodium Reactor Experiment at Santa Susana Field Lab which melted down in 1959.** The public was not made aware of the radiological incident (contamination) until 20 years later in 1979, when students found a trove of documents and did a research project. Sixty-five years later, a cancer cluster of children with rare brain cancers caused the mothers to rally for responsible (impossible) site and groundwater cleanup.
DOE ETEC site https://www.etec.energy.gov/Operations/Major_Operations/SRE.phpmolten experiment
Over 750,000 people have signed petition:
No More Kids with Cancer: Cleanup the Santa Susana Field Lab.
https://www.change.org/p/no-more-kids-with-cancer-clean-up-the-santa-susana-field-lab

077-3

077-3 DOE acknowledges that accidents have occurred in the past. DOE and the nuclear industry have taken the opportunity to learn from past accidents. Sections S.8.1.7, 2.1.7.2, 3.7.2, and A.7.2 of the EIS along with Section 8 of the Leidos Technical Report (Leidos, 2023) address the reasonably foreseeable activity of advanced nuclear reactor operation with HALEU to the extent practicable. Specific reactor accidents and consequences for advanced reactor designs are out of scope for this EIS. However, the safety of proposed advanced reactors, including those that use sodium as a coolant, are expected to be addressed during the licensing of an advanced nuclear reactor. The licensing process for advanced reactors, that would be undertaken in the future by the cognizant regulatory authority would be expected to consider a comprehensive set of accident sequences and the likelihood and consequences of these accidents. The analyses for these accidents may consider that the Experimental Breeder Reactor-II and the Fast Flux Test Facility demonstrated safe operation with sodium as the coolant. The advanced nuclear reactors would be designed to prevent or mitigate the consequences of accidents considered by the reactor designer, including features that make the reactors passively safe and preclude the occurrence of a meltdown mentioned by the commenter.

Commenter No. 77 (cont'd): Kalene Walker

CONCLUSION

This intent of this comment is directed to congress and the public, as well as the DOE.
It is a call for public discussion and debate on the proposed "safe" "clean" "nuclear solution" to our global environmental challenges. Congress has doled out 10's and 10's of billions of U.S. tax payer dollars, to subsidize a whole new wave of untested, unapproved new experimental reactors and fuel designs, etc. This has happened largely without public awareness, and certainly without an open public debate.
Meanwhile, the legacy of harm to human health and the environment at many nuclear sites remains largely ignored and unsatisfactorily remediated. And the nuclear waste from the last 60 years of nuclear sits stranded in reactor communities in canisters that crack ….

The $billions allocated to jumpstart a whole new generation of super high burnup fuel waste is premature and irresponsible. The nuclear industry - and the DOE's budget and priorities - needs a comprehensive public review.

Thank you,
Kalene Walker
April 22,2024

077-4

077-2 (cont'd)

077-1 (cont'd)

077-4 (cont'd)

077-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of the CRD for additional information related to the purpose and need. Regarding funding, DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on funding.

Commenter No. 78: Mac Donofrio

From: Mac Donofrio
To: HALEU-EIS
Subject: [EXTERNAL] HALEU
Date: Tuesday, April 23, 2024 11:22:45 AM

dear DOE,
We don't need more taxpayer subsidies for nuclear power. ▮ *078-1*
Thank you.
Mac Donofrio
[redacted]
Sent from my iPad

****
This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.

****

078-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of the CRD for additional information related to the purpose and need. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on funding.

Commenter No. 79: Catherine Sounart

From: Catherine Sounart
To: HALEU-EIS
Subject: [EXTERNAL] Nuclear clean up
Date: Tuesday, April 23, 2024 9:30:57 AM

My community is an "**entity involved in the nuclear fuel cycle"** and has been since the late 1950's.

As such we have lived with the contamination of the front end of the nuclear fuel cycle every day, because it is still not cleaned up even after 40 years as a radioactive Superfund Site.

THIS IS A DISGRACE TO OUR CITIZENS AND THEIR FAMILIES.

AND, the partnership between DOE and the nuclear industry companies in DOE's own words is intended to create ***"a commercial HALEU-based reactor economy".*** This is extremely disturbing.

For these reasons, I appeal to the DOE to choose the No Action Alternative and DO NOT Support the creation of demand and price guarantee of HALEU.

Catherine Sounart
Mother, wife, citizen

Get Outlook for iOS

079-1

079-2

079-1 DOE acknowledges your concern about legacy impacts, although these topics are outside the scope of the HALEU EIS. Please reference Section 2.4, "Legacy Issues," of this CRD for more information.

079-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 80: Anonymous

PUBLIC SUBMISSION

As of: 4/18/24, 3:29 PM
Received: March 08, 2024
Status: Pending_Post
Tracking No. lti-yio9-mfld
Comments Due: March 08, 2024
Submission Type: Web

Docket: DOE-HQ-2024-0017
Environmental Impact Statements; Availability, etc.: Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium

Comment On: DOE-HQ-2024-0017-0001
Environmental Impact Statements; Availability, etc.: Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium

Document: DOE-HQ-2024-0017-DRAFT-0001
Comment on FR Doc # 2024-04799

Submitter Information

Organization: WhoPoo App

General Comment

Build more nuclear plants. They are cleaner and less environmentally harmful than wind turbines which cannot be recycled. Please dismantle the wind turbines and put them into nuclear plants. Researchers estimate the U.S. will have more than 720,000 tons of blade material to dispose of over the next 20 years, a figure that doesn't include newer, taller higher-capacity versions.

There aren't many options to recycle or trash turbine blades, and what options do exist are expensive, partly because the U.S. wind industry is so young. It's a waste problem that runs counter to what the industry is held up to be. he blades, made of a tough but pliable mix of resin and fiberglass — similar to what spaceship parts are made from — are a different story.

"The blades are kind of a dud because they have no value," he said.

Decommissioned blades are also notoriously difficult and expensive to transport. They can be anywhere from 100 to 300 feet long and need to be cut up onsite before getting trucked away on specialized equipment — which costs money — to the landfill.

Once there, Van Vleet said, the size of the blades can put landfills in a tough spot.

"If you're a small utility or municipality and all of a sudden hundreds of blades start coming to your landfill, you don't want to use up your capacity for your local municipal trash for wind turbine blades," he said, adding that permits for more landfill space add another layer of expenses. "Out on the prairie, there's not very much scrap," he said. "The idea is to develop the next technology, otherwise, I wouldn't be doing this.

"We lose money on every blade we haul." See https://www.npr.org/2019/09/10/759376113/unfurling-the-waste-problem-caused-by-wind-energy

080-1

080-1 DOE acknowledges your support for the Proposed Action. Thank you for participating in the EIS process. Analyzing the lifecycle impacts of wind turbines falls outside the scope of this EIS. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

Commenter No. 81: Richard Spotts

PUBLIC SUBMISSION

As of: 4/18/24, 3:30 PM
Received: March 08, 2024
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Tracking No. ltj-64zu-ttae
Comments Due: March 08, 2024
Submission Type: Web

Docket: DOE-HQ-2024-0017
Environmental Impact Statements; Availability, etc.: Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium

Comment On: DOE-HQ-2024-0017-0001
Environmental Impact Statements; Availability, etc.: Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium

Document: DOE-HQ-2024-0017-DRAFT-0002
Comment on FR Doc # 2024-04799

Submitter Information

Name: Richard Spotts
Address:
[redacted]
Email: [redacted]

General Comment

Previous uranium mining created many serious environmental contamination and public health problems. Tribes were especially harmed. Many mine sites remain toxic and have not been properly remediated. This tragic history must not be repeated. Industry cannot be trusted to do what is necessary. Strict federal monitoring and enforcement is absolutely necessary. Please ensure the protection of public health and environmental quality. Thank you. ***081-1*** ***081-2***

081-1 DOE acknowledges your concern about legacy impacts, although these topics are outside the scope of the HALEU EIS. Please see the discussion in Section 2.4, "Legacy Issues," of this CRD for additional information on legacy contamination and public health. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

081-2 DOE expects that if undertaking HALEU fuel cycle activities, industry (i.e., fuel cycle facility operators) would be required to follow all applicable state and Federal regulations, including those enforced by the NRC. Under NRC regulation, facilities are required to publicly report radioactive releases; The Final EIS describes applicable federal regulations for each respective resource area analyzed (e.g., facilities would be subject to the requirements of the CWA and CAA, among others). Chapter 6 of the Final EIS Volume 1 has been revised to include a table of Federal laws, regulations, orders, and other requirements that may be applicable to the Proposed Action.

Comments from the Draft HALEU EIS Public Hearing
2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 6PM

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF NUCLEAR ENERGY

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DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR DEPARTMENT OF ENERGY ACTIVITIES IN SUPPORT OF COMMERCIAL PRODUCTION OF HIGH-ASSAY LOW-ENRICHED URANIUM (HALEU)

+ + + + +

PUBLIC HEARING

+ + + + +

WEDNESDAY

APRIL 3, 2024

+ + + + +

The public hearing convened at 2300 Dulles Corner Boulevard, Herndon, Virginia 20171, at 6:00 p.m., Wendy Green Lowe, Facilitator, presiding.

PRESENT

WENDY GREEN LOWE, Facilitator
MICHAEL REIM, Program Manager

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Comments from the Draft HALEU EIS Public Hearing
2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 6PM

P-R-O-C-E-E-D-I-N-G-S

6:02 p.m.

MS. LOWE: Okay, good evening, everyone, and thank you for joining us for this virtual public hearing. My name is Wendy Lowe, and I'd like to welcome you to this public hearing on behalf of the U.S. Department of Energy's Office of Nuclear Energy.

In compliance with the National Environmental Policy Act, the Department of Energy did publish a draft environmental impact statement which analyzes the impacts of DOE's proposed action to acquire High-Assay Low-Enriched Uranium, or HALEU, for commercial use and demonstration projects and to facilitate the domestic commercialization of HALEU production.

Before we get too far along I'd like to introduce Catherine Willett. She and her colleague, Billy Sanders, are providing American Sign Language interpretation for us for this meeting.

The goals of this public hearing are to explain the process used to analyze the proposed action and alternatives and to provide you, as members of the public, with an

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Comments from the Draft HALEU EIS Public Hearing
2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 6PM

opportunity to submit oral comments on the draft environmental impact statement. In the first portion of the meeting, DOE's program manager for the HALEU program will tell you about the draft EIS.

During the second portion you will be invited to provide oral comments. Both oral and written comments submitted throughout the 45-day public comment period will be considered by the Department of Energy. Comments received during this time will help DOE refine its analysis, identify new information and consider additional alternatives during the development of the final environmental impact statement.

Today is Wednesday, April 3rd, 2024, and the time is now 6:02 p.m. Eastern. This virtual public hearing is one of three that are being held this evening. The second hearing will begin at 8 o'clock p.m. Eastern, and the third will begin at 10 o'clock p.m. Eastern.

Please be aware that all three hearings are being recorded. The recordings for all three virtual hearings will be combined into one file, and uploaded to the project website within two weeks of this hearing.

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The information portion of this public hearing will begin shortly with a presentation by a Department of Energy's program manager, Michael Reim. His presentation was prerecorded to make sure that the information presented is consistent for all three sessions this evening. The presentation will last approximately ten minutes, and will provide background information on the National Environment Policy Act and about the proposed action.

For those who are calling in on an audio only device, I would invite you to go to the project website so that you can see an uploaded version of the presentation slides. The project website is located at https://www.energy.gov/ne/haleu-environmental-impact-statement. This link will be provided in the chat for those of you who are participating online with Zoom.

Following the presentation I will explain the procedures we will be using for taking comments.

MR. REIM: Hello, and welcome to this public meeting. I am Michael Reim, program manager for the U.S. Department of Energy, Office

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of Nuclear Energy. And today we'll be talking about the draft environmental impact statement for DOE activities in support of commercial production of High-Assay Low-Enriched Uranium, also known as HALEU.

First I'd like to give my presentation overview, beginning with the National Environmental Policy Act overview. This will include the purpose of an environmental impact statement, or EIS, comments received during the scoping period, and the purpose of public hearings in general.

Additionally I'll be discussing the project background. This includes the purpose and need, a proposed action and alternatives, scope of activities, approach to the impact analysis, the impact analysis categories, and the summary of potential impacts.

First we'll begin with the National Environmental Policy Act. NEPA is a federal law that requires federal agencies to identify and consider the environmental consequences of implementing projects.

An EIS is prepared for proposed actions likely to have significant effects. An

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EIS analyzes the effects of a proposed action and is prepared before actions are taken that could limit the selection of an alternative or result in adverse environmental effects. The EIS process incorporates public input, which is why we're here today, and informs the public and the decision-making process. Which is the purpose of this presentation.

Additionally, the purpose of the environmental impact statement is to identify the purpose and need for the proposed action, to identify alternatives. This includes a reasonable range of alternatives that meet the purpose and need, including the preferred alternative.

This also includes a no action alternative. It also describes the existing environment at candidate sites, or areas to be affected by the alternatives. It evaluates the environmental consequences of the alternatives using the best available information. It identifies mitigation measures. And it evaluates direct, indirect and cumulative impacts.

The scoping period for the HALEU EIS took place from June 5th, 2023, until July 20th,

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2023. 409 individual comments were identified. DOE reviewed each comment, documented and characterized the comments and found the public wanted several topics to be covered in the draft EIS.

This list includes accidents and human health, alternatives, climate change, conversion, cost analysis, deconversion, environmental justice and Justice-40, enrichment, environmental impacts, fuel fabrication, NEPA in general, nonproliferation, nuclear waste management, opposition to the project, out-of-scope comments, purpose and need for reactor technologies, regulatory concerns, spent fuel management, storage, support activities, transportation, and tribal consultation.

In response to the comments received, the DOE expanded discussions about how project locations would be chosen in the Reader's Guide in Section 1.0, Volume 1, and added a nonproliferation section in Section 3.9 of Volume 1.

Other topics raised were either already identified in the NOI and covered in the draft EIS, or were deemed out of scope for the

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EIS.

Next I'll discuss the purpose of public hearings, and the goals of public hearings. The purpose is to provide the public, a forum, to learn more about the draft HALEU EIS and its proposed action, as well as to solicit public comments prior to the final EIS.

The goals of the public hearings are three-fold. To Inform the public about potential environmental impacts of the Proposed Action and Alternatives. Secondly, to seek feedback from stakeholders, including Federal, state, Tribal, local agencies, NGOs, and the public on the Draft EIS. And finally, to provide opportunities for stakeholders and other interested parties to make formal comments on the Draft EIS.

Next I'll discuss the project background for HALEU. One aspect of the clean energy future is the sustainment and expanded development for safe and affordable nuclear power. And one key element of that goal is the availability of fuel to power those reactors.

HALEU is a crucial material required by most U.S. advance reactors. Most designs require HALEU in order to achieve smaller

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designs, longer operating cycles and increased deficiencies over current nuclear energy technologies.

However, there are currently limited options for acquiring HALEU. HALEU is not currently available from domestic suppliers, and gaps in supply could delay the deployment of advance reactors in the time frame that supports the nation's net zero emissions targets by 2050.

Currently, commercial nuclear fuel suppliers can't produce HALEU largely due to market uncertainties and infrastructure gaps. This poses a concern for the development, demonstration and deployment of many advanced nuclear technologies.

To accommodate these gaps and help meet the nation's net zero emissions targets, the Energy Act of 2020 directs the Secretary of Energy to establish and carry out through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use.

Further, Section 3131 of the recently enacted National Defense Authorization Act for

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Fiscal Year 2024, among other things, seeks to expeditiously increase domestic production of HALEU to meet the needs of advanced nuclear reactor developers and the consortium established under Section 2001(a) of the Energy Act of 2020.

The proposed action is to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent uranium-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production.

Given the variety of HALEU applications, the initial capability is intended to be flexible and to be able to accommodate a number of items. Enrichments of U-235 to greater than 5 and less than 20 weight percent, production of up to 290 metric tons of HALEU at multiple enrichment facilities, modular HALEU fuel cycle design concepts, and to accommodate future growth, deconversion of UF6 to forms suitable for production of a variety of fuels, and to include oxides and metal.

Under the No Action Alternative, DOE would not acquire, through procurement from

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commercial services, up to 290 metric tons of HALEU or facilitate the establishment of commercial HALEU fuel production.

The EIS addresses six activities associated with the acquisition of 290 metric tons of HALEU. Extraction and recovery of uranium ore processed to yellowcake, conversion of the yellowcake into UF6, enrichment, including enrichment to no more than five weight percent, enrichment greater than five and less than ten weight percent, and enrichment from ten to less than 20 weight percent U-235 in a NRC Category II facility.

It also includes deconversion of the UF6 to uranium oxide, metal, and potentially other forms in an Category II facility, storage in an Category II facility, and transportation of uranium and HALEU between facilities.

In addition to the previous activities, the EIS discusses three reasonably foreseeable activities that could result in the implementation of the proposed action. This includes fuel fabrication for a variety of fuels, reactor operation, including demonstration and tests, power, isotope production, and spent fuel

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storage and disposition. While not specifically a part of the proposed action, the impacts from these reasonably foreseeable activities are acknowledged and addressed to the extent practicable.

One contributing factor to the significance of environmental impacts is where facilities are located. However, locations will not be chosen as part of the record of decision for this EIS as potential HALEU fuel cycle facilities are subject to an ongoing procurement process, including responses to requests for proposal. To determine the potential environmental consequences without site specific information, DOE evaluated existed NEPA documentation for uranium fuel cycle facilities unused in the low enriched uranium fuel cycle, as well as the available HALEU fuel cycle NEPA reviews.

The activities described in the proposed action are not unique. Extensive NEPA evaluation documentation exists from environmental consequences of similar activities. Since the proposed action is to acquire HALEU from commercial sources, those commercial sources

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could propose a range of location scenarios for producing HALEU.

Scenarios could include the use of existing uranium fuel cycle facilities with modifications or expansions. It could include construction and operation of a new facility at an existing industrial site, or brownfield site. And it also could include the construction and operation of a new facility at a previously undisturbed site or greenfield site.

To estimate potential impacts associated with the proposed action, this EIS's subject matter experts leveraged the extensive existing NEPA documentations impact assessments and determined relative impacts associated with performing these activities at existing facilities, brownfield sites or greenfield sites using the NRC's impact assessment categories.

Potential modification, construction and operation of HALEU fuel cycle facilities would be subject to U.S. Nuclear Regulatory Commission and other federal agency, or agreement state licensing. Including NEPA review, and potentially other federal and state permitting.

This EIS adopts the NRC impact

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assessment categories from the NEPA documents that were used as the basis for the impact analysis. Small impacts are not detectable, or are so minor that they neither destabilize nor noticeably alter any important attribute of the resource.

Moderate impacts are sufficient to alter noticeably, but not destabilize, important attributes of the resource. And large impacts are clearly noticeable and are sufficient to destabilize important attributes of the resource.

This slide summarizes the impacts of siting a HALEU facility at the three location scenarios analyzed in this EIS. For existing uranium fuel cycle facilities most impacts would be small.

The greatest potential for large impact is associated with mining and milling, and impact levels are mine specific. For other industrial sites, or brownfield sites, impacts generally range from small to moderate, with potentially large impacts in areas associated with site demographics and historic, cultural, and ecological resources.

For previously undeveloped, or

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greenfield sites, this is similar to locating at brownfield sites with potentially larger impacts than brownfield due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

This concludes the end of the presentation portion of the meeting, and I'd like to thank you again for your participation in the EIS process.

MS. LOWE: Okay. Thank you, Mr. Reim. That concludes the information portion of this virtual hearing. Next we will begin accepting oral comments on the draft environmental impact statement.

As the moderator, it is my job to make sure that this hearing is conducted in a respectful manner and to ensure that we provide a fair opportunity to provide oral comments. Michael Reim will be listening to the comments on behalf of the U.S. Department of Energy, but please understand that he and other DOE representatives are here to listen, they will not be responding to any comments during this hearing.

A court reporter is also present, off

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screen, to transcribe each comment during this hearing. Please try to speak clearly into your microphone to help ensure that the court reporter can accurately record your comments.

I'd like to emphasize that providing oral comments during this virtual public hearing is only one of the ways that you can participate in the EIS process. You may also submit written comments by sending them via U.S. mail or by email.

Written comments on the draft EIS should be sent to Mr. James Lovejoy, the DOE EIS document manager, by mail to U.S. Department of Energy's Idaho Operations Office located at 1955 Freemont Avenue, mail stop 1235 in Idaho Falls, Idaho, 83415. If you prefer, you can send comments by email to haleu-eis@nuclear.energy.gov. Those same addresses can be used to request to be added to the mailing list for project notifications.

DOE will consider all comments received, or postmarked by the end of the public comment period, which will end on April 22nd, 2024. All comments will be given equal consideration regardless of whether they are

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submitted orally or in writing. The comments received throughout the comment period will be compiled and incorporated into a comment response document. The comment response document will include DOE's responses to comments that have been received, and will be included in the final EIS.

The opportunity to provide comments on the draft EIS began with the publication of the notice of availability on March 8th, 2024. The notice of availability included information about how commenters could preregister to provide oral comments during this session.

As we begin the oral comment portion of this hearing we have 34 people who have already registered to speak. And we will begin by taking their comments first. If you're interested in providing comments during this public hearing but you didn't register ahead of time, we will do our best to accommodate you as well.

You can let us know that you're interested in commenting by using the raised hand function in Zoom. Zoom keeps track of people who raise their hands in order, and we will call on

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you in a first come, first serve basis. Time permitting we will allow those with raised hands to provide oral comments after hearing from the preregistered attendees. If you're calling in by telephone you may also raise your hand by dialing *9.

To allow a fair opportunity to speak to as many people as possible, oral comments will be limited to three minutes per speaker. To help you keep track of time, a digital countdown clock will be provided on screen.

This session is scheduled to go to 7:45 p.m. If there is any time remaining before we're scheduled to end this session, we may provide an opportunity for anyone who has already spoken to have a second opportunity to provide comments. In addition, if we have just a few people left to call on we will go as late as 7:55 p.m.

I will call the names of two people to speak at a time to give you a bit of notice when it's almost your turn to speak. When I call on you to provide your comments our technical support team will unmute your microphones. Please begin by stating your name and the name of

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any organization that you're representing in an official capacity tonight. Your three minutes will begin at that point.

Regardless of whether you registered to speak ahead of time or if you have raised your hand to speak or if you change your mind about speaking, please let us know while you are unmuted so that we can move on to the next person in the queue.

We recognize that three minutes is a brief amount of time, and we encourage you to provide more detailed comments in writing to ensure that all of your thoughts, concerns and suggestions on the draft EIS can be fully captured in the record. I will let you know when you have run out of time. If you are still speaking once your three minutes are up, I will ask you to conclude your remarks, and then I will call upon the next speaker.

Please understand that if I do have to cut you off, it is to ensure that we can hear from as many people as possible and that everyone who wants to speak during this public hearing has a fair opportunity to do so. We will accommodate as many people as we can in this session.

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One final request that I make of you tonight, I know that some of you may have strong opinions about DOE's proposal. We hope that everyone will share their opinions in a respectful manner.

One of the main purposes of a public hearing is to give each of you an opportunity to provide your thoughts to DOE about the draft environmental impact statement. We're grateful that you have taken time out of your busy schedules to participate in this virtual public hearing.

With that we will begin taking comments. The first person on our list tonight is Abraham Brown. And Abraham will be followed by Anne Frisch.

Is Abraham Brown with us? Okay. Anne Frisch will be followed by Arianna Northbird.

DR. FRISCH: I did not sign up to give a comment at this time.

MS. LOWE: Oh, okay. Thank you, Dr. Frisch. Arianna Northbird will be followed by Chloe Nelson.

(Pause.)

MS. LOWE: Well, Chloe Nelson will be

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followed by Connie Kline.
(Pause.)
MS. LOWE: Connie Kline will be followed by Daryl Gale.
MS. KLINE: Can you hear me?
MS. LOWE: We can.
MS. KLINE: Can you hear me?
MS. LOWE: Yes, Connie, I can hear you.
MS. KLINE: I did not sign up to comment at this time either.
MS. LOWE: Okay, thank you for letting us know. Daryl Gale will be followed by David Magdangal. Oh, I just said that wrong. Magdangal.
(Pause.)
MS. LOWE: David Magdangal will be followed by Debbie Rowan.
(Pause.)
MS. LOWE: Debbie Rowan will be followed by Eugene Rosalie.
(Pause.)
MS. LOWE: Eugene Rosalie will be followed by Greg Schulze.
(Pause.)

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MS. LOWE: Greg Schulze will be followed by Jane Van Praag.
(Pause.)
MS. LOWE: Jane Van Praag followed by Janet Schlueter. Janet. Did I say Janet?
Okay, Janet Schlueter will be followed by Jeff Sims.
(Pause.)
MS. LOWE: Jeff Sims will be followed by Jennifer Thomson.
MS. THOMSON: Hi, this is Jennifer Thomson. I did not sign up to provide any comments today.
MS. LOWE: Thank you for letting us know. Jesse Deer followed by Kelly McGrath.
MR. DEER IN WATER: Do you mean Jesse Deer in Water?
MS. LOWE: Oh, okay. Thank you, Jesse Deer in Water. You may go ahead.
MR. DEER IN WATER: All right. Good day. My name is Jesse Deer in Water. I'm a member of Citizens Resistance at Fermi 2 CRAFT. We're located in Southeastern Michigan.
I'm just calling in today because this Department of Energy proposal for HALEU is

082-1

082-1 The EIS evaluates the Proposed Action and potential associated activities which include mining through the management of SNF. There are no wastes with unique characteristics. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this EIS, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage

essentially creating a whole new vastly, more dangerous nuclear field chain for nuclear power and weapons then we now have, which is already a radioactive waste issue that has been acknowledged by many folks. But anyway, it would be hard to predict the environmental impacts of a whole new more challenging field chain when, like I said, the current one has not really been fully evaluated and/or cleaned up.

This environmental impact statement is a good thing, but it must be truly programmatic. A comprehensive detailed analysis to cover an entirely new nuclear fuel chain, these proposed nuclear reactors have not been licensed or built. The radioactive intensity of this HALEU fuel is dangerously close to bomb-grade. I'm sure a lot of this has been brought up.

I've seen some of the presentation. One thing that is really concerning is the 290 tons of fuel to be created, and there's not any reactors online yet. The EIS should consider multiple additive, cumulative, and synergistic health impacts, contamination of clean and further contaminated, and already contaminated environment, impacts on water, air, plants,

082-1 (cont'd)

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and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. See Section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

082-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Regarding comments about the speculative nature of the advanced reactors, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's response.

082-3 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation

animals, socioeconomic and environmental justice.

It should also take into consideration the people who spend more time on the land, like foragers, hunters, indigenous communities. People who boat and hangout on waterways, you know. We're at a pivotal time where we can pursue the world with clean safe, renewable energy instead of plunging deeper into even worse nuclear power waste and contamination issues.

Yes, that's all I kind of would like to add for now. Yes, it just doesn't feel safe or prudent to enrich more fuel, or to enrich fuel to higher levels. We already have some experimental fuels at our local reactor that were the GNF3 fuel, which is a higher enriched fuel that's unstable and can't leave, and so we're concerned about higher fuels. Or higher enriched fuels. That's all.

MS. LOWE: Thank you so much, Mr. Deer in Water. Next up is Kelly McGrath, who will be followed by Kelsey Shank.

(Pause.)

MS. LOWE: Kellie Shank will be followed by Laura Bailey.

(Pause.)

082-5 (cont'd)

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and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

082-4 Please see response to comment 82-P-2. Further, DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. DOE proposes to procure, over a 10-year period of performance, up to 290 MT of HALEU from the commercial sector--an amount that it believes will be sufficient to facilitate a domestic, commercial HALEU fuel cycle.

082-5 Site-specific locations are not being analyzed in this EIS. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental consultation requirements. Further, due to the large number of activities and potential facilities evaluated in this HALEU EIS and the uncertainty of the numbers and locations of facilities, a cumulative effects analysis for the majority of Proposed Action and related activities is not possible (please reference Chapter 4 of the Final EIS for additional information regarding cumulative impacts associated with the HALEU EIS). The assessments of the Proposed Action in the EIS focus on past NEPA analysis for facilities which subject matter experts evaluated to determine the potential impact of future operations in support of the Proposed Action. The Final EIS has been updated to include specific hot links to the appropriate section of the 500+-page Technical Report (Leidos, 2023) to provide more detailed analyses of the bases for the conclusions, including consideration of cumulative impacts, human health, water quality, air quality, biological resources, socioeconomics, and environmental justice.

082-6 The HALEU EIS considered the exposure to workers and to a hypothetical person living at the site boundary in the analysis of health impacts. Foragers, hunters, and indigenous communities would likely spend much of their time further away

from the site. Because exposures decrease as distance increases and exposure time decreases, foragers, hunters, and indigenous communities generally would be impacted less than workers or a person living at the site boundary. This EIS does not propose selection of specific sites for HALEU fuel cycle facilities. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include , evaluations of individual and population impacts associated with the activities identified by the commenter as they related to indigenous populations, and the effect of life styles (greater reliance on hunting, local rarming, and foraging) would be addressed in a site specific environmental justice analsysis.

082-7 For more information on nuclear waste management see Section 2.4 of this CRD The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, “Purpose and Need,” of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, “Out of Scope,” of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two

decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

082-8 One of the aspects of a clean energy future is sustainment and expanded development of safe and affordable nuclear power. A key element of that goal is the availability of fuel to power advanced reactors. While HALEU is enriched to higher levels of U-235 compared with LEU, HALEU is needed for advanced reactor designs to achieve smaller designs, longer operating cycles, and increased efficiencies compared to the existing fleet of U.S. nuclear reactors that use LEU. The higher concentration of U-235 allows for smaller fuel assemblies and reactors that don't need refueling as often and reduce the volume of waste generated.

MS. LOWE: Laura Bailey will be followed by Lee Blackburn.

MS. BAILEY: Yes, this is Laura Bailey. I did not sign up to give a comment. Thank you.

MS. LOWE: Thank you for letting us know. Lee Blackburn will be followed by Louis Skriba. Louis Skriba.

MR. BLACKBURN: Good morning. My name is Lee Blackburn. I am with the Ohio Nuclear Free Network. In April of 2019, enriched uranium was found inside Zahn's Corner Middle School four miles northeast of the former Portsmouth Gaseous Diffusion Plant.

The Portsmouth Nuclear Site is home to the American Centrifuge Plant, or ACP, where HALEU is proudly being produced. The discovery of enriched uranium inside Zahn's Corner Middle School led to its closure with DOE's response being a disgraceful 16-page report that cited just two references and fully contradicted a later, more extensive study by the Agency for Toxic Substances and Disease Registry, or ATSDR.

The DOE report said only naturally occurring radionuclides were found in any of the

083-1

083-1 The EIS does address the American Centrifuge Plant and the potential impacts associated with use of that facility as part of the Proposed Action. Site-specific locations are no being analyzed in this EIS. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental consultation requirements. The assessments of the Proposed Action in the EIS for HALEU commercialization focus on past NEPA analysis for facilities which subject matter experts evaluated to determine the potential impact of future operations in support of the Proposed Action, including health and safety. DOE acknowledges that issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. (Section A.3.3.8 has been added to Volume 2 of the EIS to discuss legacy issues at Portsmouth.) However, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include an assessments of the existing affected environments, including health impacts from prior operations at specific locations, including, if applicable, the Portsmouth site. For additional information see Section 2.4, “Legacy Issues,” of this CRD.

samples, saying none of the samples indicated any excess radiological risk above background to the public. Yet the ATSDR study said the average annual net concentration of all variants of uranium from an air monitor directly across from Zahn's Corner Middle School were all above background levels for the entire five year period from 2016 to 2020.

I mention this as an example of why DOE can't be trusted. More importantly, however, is the harm being done to the inhabitants of Southern Ohio by the offsite release of enriched uranium.

For instance, in August 2022 Joseph Mangano, Executive Director of the Radiation on Public Health Project, released an epidemiological study which found that Pike County's cancer rates in 2010 to 2019 was the highest among all 88 counties in Ohio. In addition, in 2009 to 2020 infection death rate was some 50 percent higher than the U.S. for all age groups, except for persons over 75.

Pike County is home to the ACP. In addition, the Department of Labor has paid out some $11.3 billion in medical compensation to

083-1 (cont'd)

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083-2 DOE takes its responsibility for the safety and health of the workers and the public seriously. The EIS does address the American Centrifuge Plant and the potential impacts associated with use of that facility as part of the Proposed Action. Site-specific locations are not being analyzed in this EIS. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental consultation requirements. The assessments of the Proposed Action in the EIS for HALEU commercialization focus on past NEPA analysis for facilities which subject matter experts evaluated to determine the potential impact of future operations in support of the Proposed Action, including health and safety. DOE acknowledges that issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. (Section A.3.3.8 has been added to Volume 2 of the EIS to discuss legacy issues at Portsmouth.) However, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include an assessments of the existing affected environments, including health impacts from prior operations at specific locations, including, if applicable, the Portsmouth site. For additional information see Section 2.4, "Legacy Issues," of this CRD.

former Portsmouth Gaseous Diffusion Plant workers and their families.

Finally, simultaneous with the first production of HALEU at the ACP in October 2023, independently owned air monitors near the facility registered higher than typical levels of enriched uranium. So if DOE truly intends to be protective of the environment and public safety, you need to seriously rethink the issues of public and occupational health under all operations. Thank you.

MS. LOWE: Thank you, Mr. Blackburn. Louis Skriba will be followed by Madison Schroder.

(Pause.)

MS. LOWE: Madison Schroder will be followed by Mark Fallston.

(Pause.)

MS. LOWE: Mark Fallson will be followed by Martin Bryan.

(Pause.)

MS. LOWE: Martin Bryan will be followed by Martin O'Neill.

MR. O'NEILL: (Audio interference.)

MS. LOWE: Is that Martin O'Neill?

083-2 (cont'd)

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MR. O'NEILL: Yes. I (audio interference) had to submit the right comment.
MS. LOWE: Okay. Thank you so much.
MR. O'NEILL: Yes. No problem.
MS. LOWE: The next person will be Matthew Stanke followed by Mays Southwick.
(Pause.)
MS. LOWE: Mays Southwick, or Smithwick, I'm sorry.
MS. SMITHWICK: I didn't sign up to comment, I'm here to observe. Thank you.
MS. LOWE: Okay, thank you. Was that Mays?
MS. SMITHWICK: Yes.
MS. LOWE: Okay. Melanie Snyder will be followed by Michael Lee. Might be Michelle Lee. Is Melanie Snyder present? Okay. Michael Lee followed by Nicholas McMurray.
MS. LEE: Hi there. This is Michelle Lee.
MS. LOWE: Sorry I mispronounced --
MS. LEE: I'm, I will be submitting comments on behalf of a couple of organizations so I'm going to speaking on behalf of myself right now, as a private citizen.

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So as a preliminary point, I would have to note this is not your fault, but this is really a document based on completely speculative situation. You have HALEU -- facilities that were involved in fuel designs, that manufactures different -- different chemical compositions. You know, pebbles, rods, particles, you know name it, at locations all over the United States but you don't know where, but maybe it's some old places, maybe it will be some new places.

So there is really no there there to -- particularly informed opinion on. And I understand that this is, again, not the fault of the Department of Energy.

However, where I really take issue with your draft EIS is it's not an evaluation. You throw out certain facts and you render conclusions, but you don't substantiate your conclusion.

And some of the facts are absolutely scientifically false. So let me just focus narrowly on one area related to the scenario. I'm going to quote the report.

Under the scenario where no significant HALEU production materializes there

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084-1 Despite not knowing specific locations of facilities or the exact processes or technologies that might be used, DOE incorporated existing NEPA documents to cover a range of potential construction, operation, and technological scenarios. However, future facility location and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). With no specific sites identified, analyses were high level and not site-specific. Please see the response to Comment 056-7 and the "Analytical Approach" section of the Reader's Guide of the EIS for additional information on DOE's analytical approach for this EIS.

084-2 As noted in Section 1.1 of the EIS, there is currently insufficient private incentive to invest in commercial HALEU production due to the current market base and there is also insufficient incentive to invest in commercial deployment of advanced reactors because the domestic HALEU fuel cycle does not exist. Although DOE has demonstrated a need for HALEU, there are currently no drivers which would enable viable production of HALEU to replace current forms of energy. Therefore, DOE, under the No Action Alternative (see Section 2.2 of the EIS) assumes a baseline condition where existing electrical generation capacity and associated fuel sources would continue to operate if no significant HALEU production ever materializes. Under the No Action Alternative, the use of the term "immediate" does not mean that the benefits of the Action Alternative would be immediate and, nor would its implementation result in an immediate change to the United States' energy profile. Consideration of changes to other components to the energy grid outside of HALEU is out of the EIS scope of analysis and the purpose and need of the Proposed Action as described in Section 1.1 of the EIS.

would be no immediate change to the status quo. Existing electrical generation capacity would continue to operate. Traditional electricity generation sources --

This is sophistry. With the scenario of no immediate change you're not going to have any change either because we're not talking about an immediate change. You're not going to be having nuclear power plants with HALEU fuel anywhere within the next decade, right? So the word immediate doesn't even make sense there.

And when you're talking about the future, you need to compare what the future of HALEU system would be with the future of the -- electrical and energy system, which would include efficiency and grid modernization and removal and storage and a battery, but you didn't do that.

MS. LOWE: Ms. Lee, please conclude your remarks.

MS. LEE: So I'd like to check in again later if we have time.

MS. LOWE: Thank you very much. Nicholas McMurray will be followed by Patricia Marida.

(Pause.)

084-2 (cont'd)

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Comments from the Draft HALEU EIS Public Hearing
2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 6PM

MS. LOWE: Patricia Marida will be followed by Patrick Hynes.

MS. MARIDA: Hi, can you hear me?

MS. LOWE: Yes, we can.

MS. MARIDA: My name is Patricia Marida, I'm a coordinator with the Ohio Nuclear Free Network. On March 30th of 2021, three years ago, our organization sent a letter to the NRC requesting a programmatic EIS and proliferation review for Centrus American Centrifuge Operating, which already had been given the $115 million unbid contract to produce HALEU at the Portsmouth Nuclear Site in Piketon, Ohio.

In August of that same year, we, the nonprofit Beyond Nuclear, sent the petition for a review for the NRC's approval of two Centrus HALEU licenses complaining that the process was segmented into pieces to avoid EIS scrutiny of the larger HALEU development plant. And for doing this with only an -- was in violation of NEPA.

So now we're asking for this EIS. We'd like to see an environmental impact statement done for these Centrus licenses.

And interestingly, Centrus cannot

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085-1 The Centrus demonstration project at the Portsmouth Site is outside the scope of this EIS. This demonstration project was evaluated in the *Environmental Assessment for the Proposed Amendment of Nuclear Regulatory Commission License Number SNM-2011 for the American Centrifuge in Piketon, Ohio (Docket No. 70-7004)*. If Centrus is chosen as a part of the RFP process for this EIS, it will be required to go through an appropriate environmental review process as decided upon by NRC or other regulatory authority. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

085-2 As indicated in Section A.6, the Final HALEU EIS considers several packages and containers in the analysis of impacts from HALEU storage and transportation activities. The Technical Report, Section 6, "Human Health – Transportation," and Attachment A provide additional details on the packaging used for the transport of various uranium forms (e.g., triuranium oxide or yellowcake [U3O8], UF6, HALEU UF6, HALEU UO2, or HALEU metal) in this HALEU EIS (Leidos, 2023). Subsequent to initiation of the Proposed Action activities, each affected facility would be expected to identify an appropriate package or container for the storage and transport of HALEU specific to the form of materials. Centrus successfully completed delivery of the HALEU for the first phase of the demonstration project. Shortages of containers is expected to be a temporary condition caused by supply chain issues. Delays due to the shortage of containers do not alter the evaluation of impacts presented in the HALEU EIS.

Comments from the Draft HALEU EIS Public Hearing
2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 6PM

complete its designated 2024 production of HALEU because, believe it or not, there are no containers for HALEU. So perhaps you should look, this should also look at containers for HALEU and how those might be looked at under the DEIS.

Also, there is a deconversion of depleted uranium hexafluoride to uranium oxide. And now for depleted uranium weapons going on at the Portsmouth Nuclear site. Or they did get an EA, and they did not do the required environmental impact statement. Again, this is in violation of NEPA.

So American, so Mid-America Conversion needs to have, they need to have done an environmental impact statement for this process also. A true HALEU DEIS by the DOE would include having public meetings at every nuclear site in the nation, so that's what we request.

Citizens have a right to say what we think of the creation that's spreading of radioactivity that is poisoning our communities. Like the communities around the Portsmouth Nuclear Site in Piketon, Ohio.

So we're going to submit to DOE the

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085-3 Conversion of depleted uranium hexafluoride to depleted uranium oxide at the Portsmouth and Paducah Sites is outside the scope of the HALEU EIS. Construction and operation of these facilities were evaluated in the *Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio, Site (DOE/EIS-0360)* and the *Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky, Site (DOE/EIS-0359).* The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

085-4 As stated in the HALEU EIS, this EIS does not analyze site-specific locations for HALEU fuel cycle facilities. Because the Proposed Action does not include specific site locations, it would not have been feasible for DOE to host in-person public hearings at every potential national location. Instead, DOE opted for virtual meetings to provide opportunities nationally, and DOE hosted an in-person Tribal listening session in Chandler, Arizona. This session was held in coordination with another Tribal conference and was conducted to receive feedback from Tribes historically affected by uranium mining activities. During both the scoping and public comment period, DOE identified physical and digital newspaper outlets with proximity to commercial enrichment, conversion, deconversion, and fuel fabrication sites to distribute information about upcoming meetings and comment mechanisms. These locations included Illinois, Ohio, North Carolina, Idaho, Tennessee, Virginia, and Nebraska. Notices were also distributed to states historically impacted by uranium mining and milling, which included state-wide coverage in Wyoming, Texas, Arizona, New Mexico, Colorado, and Utah. During the public comment period, this notification list was expanded to include notifications near DOE National Laboratories and newspaper distributors specific to Tribal communities. In addition to the previously listed placements, these notices were placed in South Dakota, Washington DC, Oklahoma, California, Nevada, and Washington, as well as regional placements in the Pacific Northwest and several national placements. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include assessments at specific locations. See Section 1.3.1 of the EIS for additional information on public outreach.

results of two epidemiological studies done in the area, and of multiple samplings of air and soil that found transuranics and enriched uranium in Pike and Scioto County. And about which the Department of Energy lied by saying the offset radioactivity came from nuclear testing fallout.

That concludes --

MS. LOWE: Thank you, Ms. Marida. Patrick Hynes will be followed by Robin Englehart-Bagley.

(Pause.)

MS. LOWE: Robin Englehart-Bagley will be followed by Shannon Anderson.

MS. ANDERSON: Yes, hello. Hi, this is Shannon Anderson with Powder River Basin Resource Council in Wyoming. And we're concerned that the NRC hasn't met its twin charge under NEPA, which is both to provide transparency to the public and to provide enough information to create an adequate decision by the agency.

One of our main concerns is that there is no transparency in the document about the cost of this program. There is no dollar numbers anywhere in the document. This is substantial subsidies to private industry, it's also direct

085-5 (cont'd)

085-5 The EIS does address the American Centrifuge Plant and the potential impacts associated with use of that facility as part of the Proposed Action. Site-specific locations are not being analyzed in this EIS. H.As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental consultation requirements. The assessments of the Proposed Action in the EIS for HALEU commercialization focus on past NEPA analysis for facilities which SMEs evaluated to determine the potential impact of future operations in support of the Proposed Action, including health and safety. DOE acknowledges that issues could exist at a HALEU nuclear fuel cycle facility site with unresolved legacy contamination. (Section A.3.3.8 has been added to Volume 2 of the EIS to discuss legacy issues at Portsmouth.) However, issues related to legacy contamination exposure and cleanup are not within the scope of the HALEU EIS. As noted in the HALEU EIS, once sites are identified, DOE expects that the relevant regulatory authority would conduct site-specific environmental analysis for locations where HALEU fuel cycle activities would occur. As noted in the EIS, once sites are identified, site-specific environmental reviews are anticipated for locations where HALEU fuel cycle activities would occur. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. DOE does expect that this subsequent analysis would include an assessments of the existing affected environments, including health impacts from prior operations at specific locations, including, if applicable, the Portsmouth site. For additional information see Section 2.4, "Legacy Issues," of this CRD.

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086-1 DOE acknowledges your concern regarding the cost of the HALEU program. DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

spend by the agency. It contributes to our federal debt.

We live here in a state that is very fiscally conservative. And overall it was very concerned about the amount of subsidies and government spending related to the nuclear industry. And we asked DOE to have full transparency of the cost of this program, what is anticipated, what does that mean to the federal debt, what does it mean to the agency overall, your budget, your spending. There just needs to be a lot greater transparency of that money.

And we ask you, as other speakers have as well along those lines, to be conservative. A lot of the assumptions in this document are unrealistic assumptions about the need for HALEU. What that will, what the industry will develop to become. And as a result we really just ask you to be conservative in your spending, in your budgeting. And in the Government footprint of this program.

We'd also ask you to, like similar speakers have before, to conduct those actions that you have been doing as an agency. You have already been spending tremendous money for the

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086-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Section 1.1 of the EIS in which DOE has clarified the purpose and need, including the basis for the projections of HALEU needed. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. See also Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of the CRD for further discussion of these topics.

086-3 The TerraPower facility is outside the scope of the HALEU EIS. See Section 1.5 of the EIS for the scope of the Proposed Action activities. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

nuclear industry. TerraPower here in Wyoming.

And as a side note, we submitted to FOIA, to DOE to get, you know, spending reports for that project, and they were all held confidential. So there is a greater need to have transparency.

Make sure there is connected actions with the nuclear cycle across the country. There has been just tremendous money and spending, and to connect that with this program is really important.

We also would just raise the issue of the 1872 Mining Act, which a lot of uranium of course falls under. And that has also tremendous consequences for taxpayers because uranium mines under the 1872 Mining Act is royalty-free and there needs to be disclosure and information in your EIS about that.

We'd also encourage you to look at Department of Interior reports related to the 1872 Mining Act and consult with them through the interagency working group process to make sure there is coordination between your agencies about the impacts related to uranium. Particularly uranium mined under the 1872 Mining Act.

086-3 (cont'd)

086-4

086-4 The General Mining Act of 1872 authorizes and governs prospecting and mining for economic minerals, such as gold, platinum, and silver, on federal public lands. As discussed in Section 1.0.5.2 of the EIS, DOE's Request for Proposals for HALEU identified existing mining capacity as preferred. While not required, DOE anticipates that mines selected would have existing operational licenses as use of existing facilities would facilitate or shorten the startup period for the start or resumption of uranium mining activities. DOE estimates that domestic mining limited to existing mines could supply all of the needed uranium ore to support the Proposed Action. Section 1.1.2 of the Technical Report (Leidos, 2023) contains information regarding the regulatory authority for ISR mining, conventional mining and milling activities. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC).

And I guess I'm out of time, so thanks for listening. And we'll submit written comments as well.

MS. LOWE: Thank you, Ms. Anderson. Timothy Smith?

(Pause.)

MS. LOWE: So Timothy Smith is the last name on my list. I am going to go back and call on the people that I called on once before just to see if maybe they joined us late. And I'll move a little more quickly.

Abraham Brown? Arianna Northbird? Chloe Nelson? Daryl Gale? David Magdangal? Debbie Rowan? Eugene Rosalie? Greg Schulze? Jan Van Praag? Janet Schlueter? Jeff Sims? Kelly McGrath? Kelsey Shank? Lou Skriba? Louis, I'm sorry. Mr. Skriba? Madison Schroder? Mark Fallston? Martin Bryan? Matthew Stanke? Melanie Snyder? Nicholas McMurray? Patrick Hynes? Robin Englehart-Bagley? And Timothy Smith?

We do have three hands up. I will call on the folks with our hands up in order as well. Dr. Anne Frisch, followed by Lee Blackburn.

Response side of this page intentionally left blank.

(Pause.)

MS. LOWE: Dr. Frisch, did you have comments you wanted to make?

Okay, Lee Blackburn.

MR. BLACKBURN: Yes, I do. I appreciate the opportunity to make a second series of comments. First I'd like to say that the DEIS is a bit of a farce when -- one of the alternatives is no action, while HALEU is already being produced at the ACP in Piketon. Also, you say enrichment will be from 19.75 percent to 20 percent. That's a farce because the license from the ACL permits enrichment up to 25 percent. So you need to check your facts. Thank you.

MS. LOWE: Thank you for the second time, Mr. Blackburn. Anne Hedges?

MS. HEDGES: Yes, I don't know why it didn't show up in your list because I did register and got a confirmation in my registration.

MS. LOWE: Well, we're happy to take you now. Thank you.

MS. HEDGES: Okay. I just hope that didn't happen to others. So I'm Anne Hedges with Montana Environmental Information Center, which

087-1

087-1 The Centrus demonstration project is outside the scope of this EIS, although it is acknowledged in the HALEU EIS, and has undergone its own NEPA reviews. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

Centrus' NRC Materials License establishes a limit on Centrus not to input parameters to withdraw material greater than an enrichment of 20.0% weight U-235, however in recognition of the challenge in achieving 19.75% weight U-235 exactly, an allowance was made permitting Centrus to possess a small quantity of material between 20.0% and 25.0% weight U-235 in the course of cascade performance adjustments.

The No Action alternative represents the status quo where no sufficient domestic commercial fuel supply of HALEU is available and DOE would not implement the Proposed Action. See Section 2.2 of the EIS for additional information about the No Action Alternative.

088-1

088-1 Thank you for bringing this to our attention. This was the only communicated concern of its kind, so we hope this incident did not impact other attendees. After checking back, our records did not reflect your name in our pre-registration system, so it is possible it could've been a technical error or that you registered after the cutoff time (12:00pm on April 3, 2024). Apologies for this inconvenience and we appreciate you bringing this to our attention.

is a nonprofit organization in Montana that works on the climate change every day.

And we get the need to be carbonized, but that is, we believe that this whole process is being used as a smokescreen by businesses who are looking to make money off the federal government in pursuit of mythical decarbonization techniques. DOE should not overestimate the value of this sector. This isn't 1970. We have plenty of low-cost alternatives to nuclear power, especially SMRs.

This is just a way to make some money off of taxpayers. In Montana, we already pay far too much for our power thanks to coal and gas. We don't need to increase our bills even more by DOE chasing unicorns. DOE needs to be realistic about this industry and differentiate hype from reality.

Projected HALEU demand in the DEIS is unrealistic. No projects exist as of now. None of the companies have demonstrated a commercial or technical liability. It seems absurd to have such high estimates and the need for this fuel.

MEIC is particularly concerned about mining and the impacts to water resources that

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088-2 DOE acknowledges the commenter's opposition to the Proposed Action. In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Section 1.1 of the EIS in which DOE has clarified the purpose and need, including the basis for the projections of HALEU needed. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. See also Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of the CRD for further discussion of these topics.

The price of electrical power is outside the scope of this EIS.

088-3 The Final EIS has been updated to include specific hot links to the appropriate section of the 500+-page Technical Report (Leidos, 2023) to provide more detailed analyses of the bases for the conclusions, including consideration of water quality, biological resources, and environmental justice related to mining and milling.

are getting scarcer. Low-income communities who live near mines, and wildlife and endangered species.

Data show that a lot of uranium deposits in Montana, but yet there is no mention of potential mining in Montana, instead it assumes mining in states with previous uranium mines. I hope that's the case, but DOE's optimistic commercialization schedule for SMRs is unreasonable, unnecessary, expensive, harmful and opaque.

DOE needs to scale back and reconsider those places where uranium may be coming out of the ground. DOE says that this is based upon previous NEPA analysis in previous mines, but the DEIS talks about a environmental analyses that have been completed for facilities that performed uranium mining and milling.

EISs are done in advance, they are proposed projects. Where is the epidemiological data on communities where mining has actually occurred? Where is the data showing their communities, their water resources, and their wildlife are not harmed? Basing this upon projected impacts from the previous EISs is

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088-4 As stated in Section 2.1.1 of the EIS, to encourage the use of a domestic supply of uranium for the HALEU fuel cycle, in the Requests for Proposals, DOE has identified domestically sourced uranium from existing capacity as the preferred option for acquiring uranium (yellowcake).

088-5 DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. Please see Section 1.1 of the EIS which provides the bases for estimates of needed HALEU. DOE's Proposed Action is structured to support resolving the underlying dilemma of how to coordinate the development for a supply HALEU with the concurrent development of the reactors that demand its availability. The HALEU EIS analyzes the potential impacts from the construction and operation of advanced reactors that are fueled by HALEU as a reasonably foreseeable action. Not all SMRs would run on HALEU enriched to 19.75% U-235. The commercialization schedule for any reactor technology including SMRs is outside the scope of this EIS.

088-6 DOE reviewed existing information regarding mining and milling locations including NRC databases. The information included existing permitted mines and licensed milling facilities. Section 1.1.3 of the Technical Report (Leidos, 2023) contains additional information on the type of mining facilities considered and Section 1.2 of the Technical Report contains regional locations of these types of mining facilities in the United States. Please see the response to Comment 056-7 and the "Analytical Approach" section of the Readers Guide of the EIS for additional information about the analytic approach of this EIS.

088-7 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current

absolutely insufficient and doesn't capture the impacts that actually occur on the ground.

OSM also regulates coal in Montana, yet we have plenty of examples where the projections in the original EISs did not fit reality. Water resources, wildlife, aquatic life, and our agriculture have been harmed in ways that OSM didn't project. Where's the follow-up? There doesn't seem to be any here.

The U.S. doesn't purchase coal or gas for utilities, it makes no sense for the government to go so big on the technology that's in its infancy and potentially dangerous. If the U.S. Government is to buy the fuel for a nation's industry the product should be as conservative as possible, based upon actual data, not gross estimates of future demand.

The industry, the --

MS. LOWE: Ms. Hedges, we need you to conclude.

MS. HEDGES: -- rapidly. A viable SMR industry doesn't exist in this country and it is not up to DOE to help make that happen.

MS. LOWE: Thank you, Ms. Hedges. Next up is Lee, oh no, excuse me, Michelle Lee.

088-7 (cont'd)

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088-9 (cont'd)

regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD.

088-8 The EIS uses the best available information in order to assess the range of potential impacts. The Final EIS has been updated to clearly indicate how the subject matter experts (SMEs) evaluated the existing NEPA documents and updated the potential affected environments and impacts discussions. The Analytical Approach, specifically the use of existing NEPA evaluations, and Information are described in the Summary and Volumes 1 and 2 of this EIS. Additionally, Appendix A discusses that the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors, who are SMEs in their respective fields, used their education, working knowledge, experience, and professional judgement to estimate the potential environmental consequences associated with the Proposed Action. The EIS impacts section does not include historical construction and operational impacts, in part, because many of the worst impacts resulted from mid-20th century operations and practices. The significant evolution of practices, regulations, oversight, and reporting result in this information not being determined by the SMEs as being representative of future potential environmental consequences, and it was not relied on in predicting the potential environmental consequences associated with the Proposed Actions. Ongoing activities at existing facilities (also see Figure 1-3 of the Technical Report) and construction and operation of new facilities are, and would be, under the cognizant regulatory agencies' NEPA evaluations and associated license and permitting conditions. The Final EIS presents, in Volume 3, Section 2.4, "Legacy Issues," a summary of Draft EIS comments on legacy issues and provides a detailed response acknowledging past issues and the progress that is being made across agencies to address those issues.

088-9 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Section 1.1 of the EIS in which DOE has clarified the purpose and need,

including the basis for the projections of HALEU needed. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. See also Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of the CRD for further discussion of these topics. Also note that DOE will not give away the HALEU. Companies will purchase the HALEU from DOE at market prices.

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MS. LEE: Thank you.

MS. LOWE: Did I get that right this time?

MS. LEE: You did. You did.

MS. LOWE: Good.

MS. LEE: Just to continue where I was going before. The comparison and metrics is an illegitimate comparison.

With the no action alternative you make the statement that you continue, there is no action then you would have continued status quo. Which would obviously be true for the near-term we're not going to change over tomorrow, but would be very false based on current Federal Government policy even in terms of support for alternatives that are cleaner and that are safer, and are less costly, including renewables and efficiency and storage and grid modernization and so on.

So what you're actually doing is you're talking out money, a huge opportunity cost of tens to hundreds of billions of dollars to divert it to support a technology that's been heavily, heavily subsidized since its inception, but has increasingly become more costly virtually

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089-1 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

089-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Renewable energy would not meet the purpose and need. See Section 1.1 of the

every year rather than spending that money for the energy system that is stated by the federal government to be the energy system of the future, for an every day system, which is getting cheaper each year.

And to make the point again that somebody else has made, you're not putting any costs in this study, so that alone makes it an effectively meaningless document.

I would just also add, it is false, absolutely scientific false to claim that nuclear is carbon free. The full fuel cycle, which is what's relevant for greenhouse gases is not carbon free. And carbon 14, which is radioactive carbon, is created during the fission process. So we should not have a factual, scientifically factual incorrect statement in this document.

And I would just add that your health evaluation is essentially nonexistent. And I would, and I know I'm running out of time, would really strongly urge the DOE to include discussion of its leveraging advances -- to revitalize -- radiation research.

In the United States the report that is supported, done by the National Academy and

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EIS and Section 2.2, "Purpose and Need," of the CRD for additional information related to purpose and need.

Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information related to funding.

089-3 The HALEU EIS does not claim that nuclear power is carbon free. Section 4.3.2 of the HALEU EIS provides an estimate of GHG (carbon) emissions that could occur from the cumulative Proposed Action activities and the post-Proposed Action activities of reactor operations and fuel fabrication. Further, a new detailed section on greenhouse gas emissions calculations: Tables A-12 through A-15 has been added to the Final EIS as Volume 2, Section A.8.

089-4 The HALEU EIS did address, in Chapter 3 and Appendix A, the potential health impacts of all activities associated with the HALEU fuel cycle activities needed to support the Proposed Action. These include the impacts associated with mining and milling, conversion, enrichment to HALEU levels, deconversion and storage, and transportation. The assessments of potential health impacts are based on multiple NEPA documents and documented in a Leidos Technical Report (Leidos, 2023). The metric to assess human health impacts in the NEPA documents that formed the basis for the assessment of the Proposed Action was Latent Cancer Fatalities (LCF). As needed, DOE updates its radiological protection requirements to implement requirements consistent with the latest approved information from the International Committee on Radiation Protection (ICRP) and the U.S. Environmental Protection Agency (EPA). For the public and environment, these requirements flow to several DOE orders and standards (for example, DOE Order 458.1, "Radiological Protection of the Public and the Environment"). In the future, it is possible that a consensus could be reached by those organizations responsible for developing radiation protection information (including the ICRP and EPA) that regulations need to be updated based on more recent studies assessing radiological impact data. At that time, DOE and other regulatory authorities would take steps to address the implications of those changes to their radiological protection requirements and update as necessary While the other impacts the commenter identify have been linked to radiation exposure (although additional research is warranted for the link between low dose exposures and cardiovascular disease) these impacts are either not as severe as LCF or occur at a lower probability. Therefore, the use of just the exposure and LCF information provides an adequate and acceptable means to assess the differences in health impacts between alternatives.

published in 2022, which noted that the adverse health outcomes of low-dose and low-level radiation exposure, that there is increasing evidence associated with non-cancer health outcomes, such as cardiovascular disease, neurological disorders, immune dysfunction, cataracts and so forth.

You should also be identifying --

MS. LOWE: If you could finish your remarks please?

MS. LEE: Yes. For vulnerable populations, such as the developing kids, babies, girls, women, the risks of radioactivity exposure are far higher than what the average is stated, even for cancer. Thank you.

MS. LOWE: Thank you, Ms. Lee. Next up we have Leigh Ford.

MS. FORD: Hello, can you hear me?

MS. LOWE: Yes.

MS. FORD: Hi. Thanks for the opportunity to comment. My name is Leigh Ford, I am the director of Snake River Alliance. We're based in Shoshone-Bannock land, southern Idaho. We formed because we found out the Department of Energy was injecting our sole source aquifer with

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089-5 DOE acknowledges that the impacts of radiation to women and children are generally, but not for all types of cancers, higher than for men. Note that Section 1.3.11, "Public and Occupational Health –Normal Operations," of the technical report was developed using the average dose to latent cancer fatality conversion based on all ages and both sexes (EPA Federal Guidance Report [FGR] No 13 - Cancer Risk Coefficients for Environmental Exposure to Radionuclides 1999). FGR No 13 developed risk coefficients for a stationary population with gender and age distributions that would occur in a closed population. This methodology was deemed appropriate for consideration of long-term, chronic exposures to the U.S. population. Risk coefficients for the stationary population were compared to short-term exposure of a population with gender and age distributions, but with the same survival functions and cancer mortality rates as the stationary population. The comparisons show that the risk coefficients for the stationary population are reasonably good approximations of the corresponding risk coefficients for short-term exposure. Using FGR No 13 is considered an acceptable methodology for NEPA analysis

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radioactive waste. And we received also the melted-down core from Three Mile Island.

We will submit our comments in writing, either individually or in coalition, but we do support the no action alternative. This is a waste of money and it's a waste of time on false solutions. ***090-1***

I'd like to echo what, I think a hundred percent, of the commenters have said. And what Michelle Lee just said in that it is not carbon free and there's no way it can help us meet our carbon neutral goals in time. ***090-2***

The proliferation risk is too big, the security risks are too big. The transportation is going to spread risk through communities and risk health, water. ***090-3*** ***090-4***

And as you heard from the good people in Ohio, it's dangerous to workers. And the exposure to HALEU is a hotter fuel with more fissile material. It's very concerning.

Both my grandfathers worked at Idaho National Lab and they both died of radiological-related cancers, so I can attest to the need, like Michelle Lee said, to do more health studies. And thank you for the opportunity to ***090-5***

090-1 DOE acknowledges your support for the No Action Alternative and your support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

090-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Section 2.2, "Purpose and Need," of this CRD for a discussion of this topic and DOE's response. No electrical generation technology is 100% carbon free, but some are better than others and nuclear has been shown to be better than most. This is in part due to the long operating period of most commercial nuclear reactors (40 to 80 years) when little greenhouse gases are emitted by the reactor facility. As described in Section 2.6.2 of the HALEU EIS, the full-lifecycle GHG emissions of coal and natural gas-power generation sources are substantially higher than for nuclear power. For instance, coal generates 820 grams (g) of carbon dioxide equivalent (CO_2e) per kilowatt-hour (g CO_2e/kWh) of electricity, while natural gas produces 490 g CO_2e/kWh. Even hydroelectric and solar produce lifecycle emissions at 24 g CO_2e/kWh and 41 g CO_2e/kWh, respectively. In contrast, nuclear power produces 12 g CO_2e/kWh (Schlömer et al., 2014). Therefore, using coal or natural gas (and even hydroelectric and solar) to generate electricity would result in higher GHG emissions. Also as described in Section 2.7.1.3 of the HALEU EIS, emissions from the Proposed Action (construction and operations of facilities and inter-site transportation) and related activities would occur over a period of up to 10 years (except up to 60 years for advanced reactors operations with the use of HALEU fuel) and could add between 770,000 to 2.45 million MT of CO_2e to global GHG emissions. Offsetting the CO_2e emissions from the Proposed Action and related activities would be the expected reduction of CO_2e emissions if the power produced were from reactors fueled by the up to 290 MT of HALEU instead of power produced by existing electrical power generation sources within regions across the United States. The total electrical power that could be generated by advanced reactors with the use of HALEU fuel produced under the Proposed Action is estimated to be roughly between roughly 44 and 64 gigawatt-years (electricity), or between 385,000,000 and 569,000,000 megawatt-hours (MW-h). Total CO_2e

emitted from the generation of roughly 385,000,000 MW h by existing electrical power generation sources could range from a low of 42.4 million MT to a high of 288.8 million MT, and from the generation of 569,000,000 MW-h could range from 61.7 million MT to a high of 420 million MT depending upon the mix of current generation capabilities assumed. These estimates reveal that electrical power generated by HALEU-fueled ANRs would result in 94% to greater than 99% lower CO_2e emissions, compared to power generated from the combination of existing non-nuclear sources.

090-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

090-4 See the response to Comment 073-20.

090-5 The characteristics the commenter references relates to spent nuclear fuel, fuel that has already been used in a reactor. The uranium addressed in the Proposed Action has not been converted into fuel and has not been used in a reactor. As needed, DOE updates its radiological protection requirements to implement requirements

consistent with the latest approved information from the International Committee on Radiation Protection (ICRP) and the U.S. Environmental Protection Agency (EPA). For the public and environment, these requirements flow to several DOE orders and standards (for example, DOE Order 458.1, "Radiological Protection of the Public and the Environment"). In the future, it is possible that a consensus could be reached by those organizations responsible for developing radiation protection information (including the ICRP and EPA) that regulations need to be updated based on more recent studies assessing radiological impact data. At that time, DOE and other regulatory authorities would take steps to address the implications of those changes to their radiological protection requirements and update as necessary. Epidemiological, health, studies would address past activities and their impact on surrounding communities. As such the studies would be site, area, specific. Since the HALEU EIS does not address specific sites. Decisions being supported include facilitating the establishment of a commercial HALEU fuel production capability but do not include selecting sites for any of the necessary activities. Epidemiological studies would be associated with legacy impacts. Addressing legacy impacts is not within the scope of this EIS. For additional information see Section 2.4, "Legacy," of this CRD.

comment. Like I said, we'll submit better, more thorough comments in writing. Thank you.

MS. LOWE: Thank you. Next up, Dr. Anne Frisch.

DR. FRISCH: Yes. Before you didn't hear me because I was muted, but I really object to not being able to see other people here, so I ask you to open up the videos for people to see and for me to speak.

I'm very concerned about the transportation. I'm concerned about the whole thing because nuclear is such an antiquated, dangerous technology that we shouldn't even be talking about.

I have not read this proposal. But I am very concerned about something that I think flies under the radar, and that is, this material is going to be transported from here to there in our neighborhoods, in our highways, under our bridges. And this is very dangerous.

I make reference to the shipment of high-level liquid material from -- River to South Carolina in a truck that was never built to carry liquid material. Nuclear material.

So we know that the authorities are

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091-1 This request was not granted. Virtual meeting participants were unable to turn on their cameras during public hearings to maintain privacy during a recorded session and to maintain a distraction-free environment.

091-2 See the response to Comment 073-20.

091-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Regarding comments about the speculative nature of the advanced reactors, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost than the previous commercial LEU reactors. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the Federal government regulators (primarily the NRC) to overcome these obstacles. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's response. In addition, as summarized in Section 2.6 of the HALEU EIS, the impacts to human health from normal operations of HALEU fuel cycle facilities are expected to be SMALL, with the potential for MODERATE human health impacts from some accident scenarios.

091-4 The commenter is referencing an action that was previously evaluated by the DOE and the Canadian Nuclear Safety Commission (CNSC) as documented in the DOE/EIS-0218-SA-07 and CNSC, 2014. The highly enriched uranium liquid target materials were transported from Chalk River in Canada to Savannah River Site in 2016 in a

not having security of our neighborhoods and our children and in their minds when they're doing this. I think this is an industry promotion that does not take into consideration Fukushima and other disasters. But the disasters could take place right in our neighborhoods. A truck could tip over on the bridge and the water, drinking water, undrinkable for a million years because it has cesium in it.

And this isn't acceptable just to promote an industry policy. It is not needed or anything basically. It's dangerous and we should stop doing it.

MS. LOWE: Thank you so much, Dr. Frisch. It looks like I missed one. Joseph DeMare. Maybe it's pronounced wrong. Joseph R. DeMare.

MR. DEMARE: No, you pronounced it correctly.

MS. LOWE: Okay, thank you. You can go ahead.

MR. DEMARE: Okay. Okay, my comments, I'm scheduled to comment after 10 o'clock, and I'll do most of my comments then, but right now I want to take advantage, to point out that the

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certified shielded transportation package called NAC-LWT. The analyses in these documents evaluated the potential impacts from both incident-free and accident conditions. These activities are outside the scope of the Proposed Action and this HALEU EIS. For additional information about transportation, see Section 2.6, "Transportation," of the CRD.

091-5 Commercialization of the HALEU fuel cycle could be considered industry promotion because it provides incentive for private companies to invest in the development of HALEU fuel production capabilities. Fukushima and other events provide lessons learned that can be applied to the design of nuclear fuel cycle facilities and reasonably foreseeable facilities and activities. The HALEU EIS evaluates the impacts from nuclear fuel cycle facilities that would be required for HALEU fuel commercialization and the impacts from reasonably foreseeable activities related to using HALEU. Many requirements exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. As part of the licensing process for nuclear facilities, a comprehensive set of accident sequences and the likelihood and consequences of these accidents would be analyzed to assure safety of the public and workers.

091-6 See the response to Comment 091-P-4.

091-7 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Regarding comments about the speculative nature of the advanced reactors, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost than the previous commercial

basic assumption behind this EIS is false.

Nuclear power is not needed to meet our carbon free goals. And an example of that can be found in Uruguay which is now essentially 100 percent carbon free. Consciously deciding to do that without nuclear power because they knew it was a distraction and a waste of time and money. Portugal, similarly without nuclear, has reached 80 percent renewables.

And you're required to use the best available information, so I suggest that you include in your reading, in your resources, the book, No Miracles Needed by Dr. Mark Jacobson. And look at the events that he points out there before you choose which alternative. And in fact, he should you lead you to the no action alternative.

One thing that you also need to take into account is the fact that there might be notetakers for this HALEU. There is no guarantee that TerraPower is going to succeed as a company. NuScale is in the process of failing.

The first responsibility of the NRC is to protect the safety of the public. And creating this HALEU is, in itself, a risk since

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LEU reactors. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the Federal government regulators (primarily the NRC) to overcome these obstacles. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's response.

091-8 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information.

092-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please refer to Section 2.2, "Purpose and Need," of this CRD for a discussion of this topic and DOE's response. No electrical generation technology is 100% carbon free, but some are better than others and nuclear has been shown to be better than most. This is in part due to the long operating period of most commercial nuclear reactors (40 to 80 years) when little greenhouse gases are emitted by the reactor facility. As described in Section 2.6.2 of the HALEU EIS, the full-lifecycle GHG emissions of coal and natural gas-power generation sources are substantially higher than for nuclear power. For instance, coal generates 820 grams (g) of carbon dioxide equivalent (CO_2e) per kilowatt-hour (g CO_2e/kWh) of electricity,

it is a toxic, dangerous radioactive substance. There needs to be a process for attenuation if there is no demand for your product. Because right now renewables are replacing nuclear all around the world, and by the time we get to the ten year mark, nuclear will have probably been cancelled all over the world since renewables are so cheap and so readily available.

So, simply setting a goal of 250 tons is insane. And that was demonstrated by both the U.K. and Japan who have plutonium reprocessing. And U.K. is sitting on 100 tons of plutonium it does not know what to do with. Japan is sitting on 50 tons of plutonium it does not know what to do with. The U.S. should not similarly be stuck with 250 tons of HALEU it doesn't know what to do with if there is no demand for it.

So there needs to be a stepped process. You've already made some, why don't you stop there and see if there is any more demand before making more.

And as I said I'm also signed up to speak up at 10 o'clock and that's when I'll be giving most of my comments, but I wanted to get that in while I had the opportunity. Thank you.

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while natural gas produces 490 g CO_2e/kWh. Even hydroelectric and solar produce lifecycle emissions at 24 g CO_2e/kWh and 41 g CO_2e/kWh, respectively. In contrast, nuclear power produces 12 g CO_2e/kWh (Schlömer et al., 2014). Therefore, using coal or natural gas (and even hydroelectric and solar) to generate electricity would result in higher GHG emissions. Also as described in Section 2.7.1.3 of the HALEU EIS, emissions from the Proposed Action (construction and operations of facilities and inter-site transportation) and related activities would occur over a period of up to 10 years (except up to 60 years for advanced reactors operations with the use of HALEU fuel) and could add between 770,000 to 2.45 million MT of CO_2e to global GHG emissions. Offsetting the CO_2e emissions from the Proposed Action and related activities would be the expected reduction of CO_2e emissions if the power produced were from reactors fueled by the up to 290 MT of HALEU instead of power produced by existing electrical power generation sources within regions across the United States. The total electrical power that could be generated by advanced reactors with the use of HALEU fuel produced under the Proposed Action is estimated to be roughly between roughly 44 and 64 gigawatt-years (electricity), or between 385,000,000 and 569,000,000 megawatt-hours (MW-h). Total CO_2e emitted from the generation of roughly 385,000,000 MW-h by existing electrical power generation sources could range from a low of 42,4 million MT to a high of 288.8 million MT, and from the generation of 569,000,000 MW-h could range from 61.7 million MT to a high of 420 million MT depending upon the mix of current generation capabilities assumed. These estimates reveal that electrical power generated by HALEU-fueled ANRs would result in 94% to greater than 99% lower CO_2e emissions, compared to power generated from the combination of existing non-nuclear sources.

092-2 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need" of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and

need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.A country's decisions on the approaches to address climate change can be driven by many factors considering different starting points and circumstances; not all of which depend on the merits of the technologies themselves.

092-3 The viability of any individual reactor technology including TerraPower and NuScale is outside the scope of this EIS. The scope of the Proposed Action activities is described in Volume 1, Section 1.5, of the Final EIS.

092-4 Thank you for your comment. This EIS was prepared by DOE. The responsibilities of the NRC in protecting the public are not within the scope of this EIS. It is anticipated that as part of the licensing review of any HALEU fuel cycle facility that falls under the regulatory authority of the NRC, the NRC would perform the required NEPA analysis.

092-5 Congress has directed DOE to implement the Proposed Action described in Section 2.1 of the HALEU EIS. Please refer to Section 2.2, "Purpose and Need," of this CRD for a discussion of this topic and DOE's response. Renewable energy projects would not meet the purpose and need and are outside the scope of the HALEU EIS. It is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of

uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles.

092-6 As described in Section 1.0.2 of the HALEU EIS, the Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use, and to make such HALEU available to members of a DOE HALEU consortium by January 1, 2026 (Section 2001 of the Energy Act of 2020 (a)(1); (2)(H) [42 U.S.C. 16281(a)(1); (2)(H)]). DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. See Section 1.1 of the EIS and Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for further discussions of this topic and DOE's responses.

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MS. LOWE: Thank you, Mr. DeMare. Patrick Marida? Or Pat Marida.

MS. MARIDA: Yes. My name is Patricia Marida, I'm speaking again. I'm the coordinator of the Ohio Nuclear Free Network, or one of the coordinators.

I want to talk about proliferation. Weapons proliferation. And also the conflation between civilian and Military uses of HALEU.

19.75 percent is a laughable amount because it really is almost impossible to get it at that precise amount. So why 19.75 percent? Well, at 20 percent it cannot be exported, legally, according to OPOS law. And also at 20 percent it is no longer low-enriched it is, by definition, high-enriched.

So there isn't desire to export this. And there is competition, though, between the different states, like Russia and so forth to export nuclear technology and to get developing countries on the political side and dependent upon the United States militarily and politically.

And then this HALEU of course is, the conflation with Military uses is this very easily

093-1

093-2

093-3

093-4

093-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that (1) adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

093-2 19.75% represents the lower range of the weight percent uranium-235 being sought by DOE. HALEU is defined as uranium in which the concentration of the isotope uranium 235 has been increased to over 5 weight percent but less than 20 weight percent; however, the Proposed Action (as fully discussed in Section 1.5) is specifically limited to HALEU enriched to at least 19.75 and less than 20 weight percent. This range allows for the production of HALEU fuel in enrichments suitable for advanced reactors.

093-3 HALEU is defined as uranium in which the concentration of the isotope uranium-235 has been increased to over 5 weight percent but less than 20 weight percent. The Proposed Action is specifically limited to HALEU enriched to at least 19.75 and less than 20 weight percent. This range allows for the production of HALEU fuel in enrichments suitable for advanced reactors. Further, the relevant HALEU provisions

enriched to higher enrichment of U-235. So for military uses.

And the, everything about the industry overlaps almost from mining, milling, enrichment. All overlap between nuclear and civilian. They have the same waste, they have the same, many of the same experts that work on it. The personnel, the parts.

And there are laws in the U.S. that make it not, not legal to go between military and civilian. It was supposed to be separate, but indeed they are not. And HALEU is the prime example.

Of course, with nuclear site is a primary example. And also they're using the waste then to make depleted uranium weapons, including the certain type of nuclear bombs that can have the amount of explosion power dialed up or down.

So I think that part of the DEIS should certainly include proliferation and the overlap between Military and civilian uses. Thank you.

MS. LOWE: Thank you so much. There are no new hands up, and there are no more people

093-4 (cont'd)

under the Energy Act of 2020 are focused on HALEU for civilian domestic uses. As described in Section 1.0.2 of the HALEU EIS, the Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use, and to make such HALEU available to members of a DOE HALEU consortium by January 1, 2026 (Section 2001 of the Energy Act of 2020 (a)(1); (2)(H) [42 U.S.C. 16281(a)(1); (2)(H)]. Section 2001(a)(2)(D)(v) of the Energy Act of 2020 more specifically focuses on the acquisition of HALEU produced by a commercial entity using enrichment technology and making it available for commercial use or demonstration projects.

093-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Volume 1, Section 3.9, "Nonproliferation and Terrorism Concerns," of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

on the list. I thought I'd circle back on two people that spoke earlier that have not spoken a second time. Jesse Deer in Water and Shannon Anderson. Do you want to add anything to what you said previously?

Well, we will take a recess. We'll be here. If I see any hands go up we'll go back on the record and take additional comments. Again, we're scheduled to go till 7:45, so if somebody decides they want to make a comment between now and 7:45 we'd be happy to call on you to speak.

If you are, oh, you took the slides down, do you want to put that slide back up? There is the slide that has the addresses for submitting comments. No.

Oh, we do have some hands up. Okay, thank you for letting me know. Caller number 2341, if you would like to speak.

MS. THATCHER: Hi, can you hear me now?

MS. LOWE: Yes, we can.

MS. THATCHER: (Audio interference) -- focus on -- disposal. (Audio interference.) Liability overage does not apply to reactors that are below (audio interference) insurance policy,

Response side of this page intentionally left blank.

and it's confusing because it's different than it has been for the large (audio interference) reactors. Spent fuel dry storage facilities, they would not be covered for (audio interference) --

MS. LOWE: You're --

MS. THATCHER: (Audio interference) 140,000 metric tons (audio interference) --

MS. LOWE: We're having a little trouble hearing you.

MS. THATCHER: (Audio interference) disposal problem --

MS. LOWE: Can --

MS. THATCHER: -- increasing --

MS. LOWE: We're having a little bit of trouble hearing you. Are you speaking directly into your phone? Hello?

MS. THATCHER: Thank you. Is this --

MS. LOWE: That's better.

MS. THATCHER: I'm sorry, is this better?

MS. LOWE: Yes.

MS. THATCHER: This will be better? I'm sorry.

MS. LOWE: Start over. We'd like you

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to start at the beginning.

MS. THATCHER: So we already need -- we already need two Yucca Mountains, and the Department of Energy has no spent nuclear fuel disposal program. The program has not been able to take money for disposal for electricity generation since 2014.

Because DOE has no program, the draft EIS has strange and erroneous statements in it like the spent nuclear fuel will be irretrievably stored underground in sealed tunnels. Well, there is no decision on the type of repository, when it would be sealed, when you could seal it a hundred years after you placed it. Completely not based on any documentation for any repository plan.

The EIS says that the commitment to DOE, the DOE has for disposing of spent nuclear fuel references another EIS for a material testing reactor. They can't just make that bold claim, DOE is committed to spent nuclear fuel disposal in this EIS.

I mean, that's how -- the Department of Energy is committed to giving the impression that it's working on spent nuclear fuel disposal

094-1

094-1 SNF has a long history of being safely managed and that management is subject to extensive regulatory requirements. These requirements address packaging, transportation, and interim storage. The characteristics of the various potential HALEU fuel assembles and therefore the associated characteristics needed for analytical evaluations cannot be known at this time and not ripe for any NEPA evaluations. When a HALEU fuel assembly design is prepared, the cognizant regulatory authority will perform the NEPA evaluation as part of the licensing and permitting processes. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, HALEU Spent Nuclear Fuel Storage and Disposition, HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of

repository but it isn't. It has no program. And it also is way behind the game on even assuring the safety of the spent nuclear fuel we already have. It has researched out to identify.

In 2012 it's still working on, doesn't have answers to. The problem keeps getting more complex. DOE's research keeps getting farther behind. These advance reactors mean that the Department of Energy really will never catch up with providing the technical basis for the storage and disposal solution that we need.

So there is a complete lack of referenceable, accurate, transparent information regarding the elephant in the room, which is all the spent nuclear fuel this HALEU program would create if it is actually to make any difference whatsoever. But it's going to be deployed so slowly it will never make a difference in combating climate -- So thank you.

MS. LOWE: Before you conclude --

MS. THATCHER: Appreciate it.

MS. LOWE: -- will you please give us your name? We didn't hear your name when you started.

MS. THATCHER: My name is Tammi

094-1 (cont'd)

094-2

spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

094-2 In regard to your comment about the speed of deployment and effect on climate change, DOE is aware of numerous studies showing the benefits of nuclear energy on reducing greenhouse gas emissions and their impacts on climate change (see https://world-nuclear.org/nuclear-essentials/how-can-nuclear-combat-climate-change#:~:text=Nuclear%20power%20plants%20produce%20no,electricity%20when%20compared%20with%20solar and https://www.iaea.org/bulletin/what-is-the-clean-energy-transition-and-how-does-nuclear-power-fit-in.) See also Sections 2.6.2 and 2.7.1.3 of the EIS for discussion of the potential decreased greenhouse gas emissions associated with the Proposed Action. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

Thatcher.

MS. LOWE: Thank you, Tammi. Okay.

MS. THATCHER: Thank you.

MS. LOWE: The next person, Joseph DeMare, you have your hand up again?

MR. DEMARE: Yes. I forgot to mention that I am representing the, I'm the co-chair of the Wood County, Ohio Green Party.

Also, I wanted to add a few more things. The DEIS claims that most advanced reactor designs require HALEU. There is no support for this statement. As I understand it, most of the more advanced designs, most of the SMRs are basically scaled down versions of regular pressurized water reactors, or boiling water reactors.

We need to know how or why the Department of Energy believes this. At the moment it looks like this is only benefitting one company, and that of course is TerraPower. Bill Gates' company. And I will be talking more about that in my 10 o'clock remarks.

But I do want to point out that the NRC's first responsibility is to protect the safety of the public. And even though this

095-1

095-1 Some small modular reactors (SMRs) that plan to use existing technology and fuels are not considered advanced nuclear reactors. TerraPower may be on the leading edge of developing an advanced nuclear reactor that requires HALEU but there are a number of other proposed reactors that plan to use HALEU. For example, X-energy, Oklo, Kairos, Westinghouse, and Ultra Safe Nuclear have plans to use HALEU. The source of the information is documented in Section 8.1.3 of the Technical Report (Leidos, 2023) See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of this CRD for additional information.

095-2

095-2 Thank you for your comment. This EIS was prepared by DOE. The responsibilities of the NRC in protecting the public are not within the scope of this EIS. It is anticipated that as part of the licensing review of any HALEU fuel cycle facility that falls under the regulatory authority of the NRC, the NRC would perform the required NEPA analysis.

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money, this proposed project is a result of congressional direction, Congress cannot direct the NRC to violate its basic purpose and its fundamental reason for existence.

So choosing the no action alternative would be a real possibility, and in keeping with the organization's goals and objectives. Thank you.

MS. LOWE: Thank you, Mr. DeMare. Seeing that there are no hands up we will, I don't want to call recess, we'll just take a little bit of a break here and watch to see if any other hands go up. We're scheduled to go till 7:45, so the opportunity will be available until that time if anyone on the call decides they would like to join and provide comments.

(Pause.)

MS. LOWE: In case anybody --

PARTICIPANT: You're muted. Everybody is muted.

MS. LOWE: Unmute it. Can you unmute me for a moment?

PARTICIPANT: Do you want to mute?

MS. LOWE: No, I wanted to be unmuted. I'm sorry.

095-2 (cont'd)

095-3

095-3 DOE acknowledges your preference for the No Acion Alternative. DOE reiterates the Council on Environmental Quality (CEQ) statement: "Commenting is not a form of 'voting' on an alternative" (CEQ 2021). The number of comments received for or against a particular alternative does not dictate the action that a Federal agency must take.

PARTICIPANT: You're good.
MS. LOWE: I'm good? Okay. I just want to point out that the slide that's up right now has the address for submitting comments if anybody is interested in going ahead and dropping off before we close at 7:45. Here's the information that you might need to submit comments in writing.
(Pause.)
PARTICIPANT: There's a hand up from --
(Simultaneous speaking.)
MS. LOWE: Yes, he did.
(Simultaneous speaking.)
MS. LOWE: Oh, he says he has his hand up.
PARTICIPANT: Okay. All right.
MS. LOWE: It looks like Joseph DeMare would like to speak again.
MR. DEMARE: Yes. I may as well take the bird in the hand and give my remarks. On Page 2 of the summary of the EIS there is an incorrect statement. NRC claims that there is a, quote, long history of activities being conducted safely, unquote. It's talking about activities

096-1

096-1 DOE acknowledges the occurrence of legacy contamination. Please see Section 2.4, "Legacy Issues," of the CRD for additional information. Please see the response to comment 0056-1 which provides additional information on the analytical approach used in the EIS to determine impacts related to mining and milling, as well as updates to the EIS on this subject.

such as mining, milling and processing of uranium.

Actually what there is, is a long history of contamination. We only have to look at West Valley, New York, Piketon, Ohio, the Nolichucky River and Davy Crockett Lake, and that's in Erwin, Tennessee. That was contaminated back in 2010. Coldwater Creek, Missouri of course.

In 2016 the Canyon Mine in Nevada flooded. And aquifer was pierced. Radioactive water was put into the aquifer and sprayed onto the grounds of the Kisatchie National Forest. ProPublica -- article about -- starting with Cold War legacy lists 48 sites that the NRC has supposed to have taken care of, many of which are still contaminating ground and surface waters.

In 2015 the NRC cancelled a health study that would show the devastating effects of these accidents because they claimed they did not have $8 million. So the EIS, the final EIS must explain these failures and the remedies for them and give concrete detailed practices explaining how and why those wouldn't happen with this project, otherwise the public must assume that

096-1 (cont'd)

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these kind of contaminations would happen again.

Also, the agency is required to use the best available data information. I noticed that none of the references include the INWORKS study, which was published in the British Medical Journal on August 16th of 2023, titled, Cancer Mortality of Low-Dust Exposure to Ionising Radiation.

This study, based on 300,000 rad workers with more than 40 years of data, these are measured exposures not estimates. This shows that all the estimates that NRC are using for the damaging effects are wrong. It shows that even at the very low doses it increases cancer mortality substantially. And this is not estimates the way all the NRC studies are, this is actual measured exposure. And so this information must be incorporated into any filed EIS statement.

Finally, HALEU right now is only benefitting one company, TerraPower, that's owned by Bill Gates. Bill Gates gave $500,000 to the Biden inauguration fund, and $70 million to a dark money PAC to elect Democrats in the last election.

096-1 (cont'd)

096-2

096-2 The HALEU EIS considered the exposure to workers in the analysis of occupational health impacts. For most of the NRC regulated facilities, worker doses were based on data contained in NRC annual occupational exposure reports (see Sections 3.3.11.4, 4.3.11, 5.3.11, and 7.3.11 of the Technical Report) (Leidos, 2023). While the information referenced by the commenter is noted, any conversion of dose to health effects is performed using dose conversion rates currently approved by DOE, NRC or EPA. Should new information indicate the conversion factors should be modified, these agencies would take steps to appropriately modify these factors.

096-3

096-3 The viability of any individual reactor technology including TerraPower is outside the scope of this EIS. Also note that DOE will not give away the HALEU. Companies will purchase the HALEU from DOE at market prices. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS. See also Section 2.8, "Out of Scope," of the CRD for additional information on funding.

The social damage caused by the loss of confidence in our institutions like the Government and NRC are causing large destabilizing impacts on the culture of Americans. And the only advantage, the only way around that for this project is to ensure that Bill Gates does not personally benefit. That his company does not receive any economic benefit from this project.

That is sell, if you were going to sell him HALEU it has to be at market prices and not given to him for free or given to him for cheap so that he can make tons of profit off his reactor designs.

MS. LOWE: Thank you. And we'll wait and see if anyone else wants to show up. Or show, put their hand up to speak.

(Pause.)

MS. LOWE: Okay, I see a hand for Connie Kline.

MS. KLINE: Can you hear me?

MS. LOWE: Yes.

MS. KLINE: I just have a couple of procedural questions. When will DOE respond specifically to individuals? When will they,

096-3 (cont'd)

097-1

097-1 All comments are being responded to in this CRD. When appropriate, responses will be directed to a summary response towards the beginning of this CRD. Most scenarios where this would be applicable are for frequently commented on aspects of the HALEU EIS. Otherwise, individual responses are provided.

will the individuals questions or comments be responded to, or will this just be a general response?

MS. LOWE: We're not talking questions this evening. As I said in my script, there would be a comment response document that will be prepared, and it will be included in the final environmental impact statement.

MS. KLINE: Okay, I heard that, but will it be specific to individuals that have either submitted comments, and there were a few questions, either tonight or in writing?

Will -- specifically address those individuals?

MS. LOWE: Can I suggest that you make that as a comment because we're not taking questions tonight.

MS. KLINE: Okay. So --

MS. LOWE: You would like to see comments responded to individually, is that what you're suggesting?

MS. KLINE: Right. Right.

MS. LOWE: Okay.

MS. KLINE: Just specific individuals.

MS. LOWE: Okay.

097-1 (cont'd)

097-2

097-2 DOE responses are being provided in this CRD for every comment received during the formal comment period for this EIS.

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MS. KLINE: And what did you say? Was there a, I may have missed it, was there a timeline for, or what -- that's a question.

MS. LOWE: It's hard, isn't it?

MS. KLINE: I'd like to know the timeline for issuing the responses and the DEIS.

MS. LOWE: The next document will be the final EIS, not the DEIS.

MS. KLINE: No, I'm sorry. Yes. Yes. Yes.

MS. LOWE: And it will include a final environmental impact statement. I don't know the answer, and they're not taking questions tonight --

MS. KLINE: Okay.

MS. LOWE: -- so --

MS. KLINE: Thank you.

MS. LOWE: Thank you.

(Pause.)

MS. LOWE: If you're joining us late, just so you know what's going on, we've called on all the people that preregistered to speak. If you would like to speak, please raise your hand using the raise hand function in Zoom and we will call on you to speak. This session is scheduled

097-2 (cont'd)

097-3

097-3 All are being responded to in this CRD. During the public hearings, the expected timeline for the issuance of the Final EIS was projected for Summer 2024; however, the schedule is subject to change depending on the number of comments received, the number of revisions required, and internal reviews schedules.

to go till 7:45, and we are here and waiting for anyone that would like to provide any comments.

(Pause.)

MS. LOWE: It looks like Joseph DeMare has his hand up.

MR. DEMARE: Yes, I would like to just expand a little bit on my third point about the erosion and the large destabilizing impact culturally on the scandals that have been facing the nuclear industry in recent years.

I was deeply involved in Ohio in the House Bill 6 scandal where a nuclear corporation spent $65 million bribing one of our legislatures to push through a billion dollar subsidy for their nuclear plants.

This follows, of course, a huge scandal in Illinois involving kickbacks. And Holtec, which was just recently granted a $1.5 billion loan by the Department of Energy was just recently fined a substantial amount of money for lying to federal regulators in order to get other grants that it wasn't actually eligible for.

The cumulative impact of all these scandals in the nuclear industry on the public's trust in both government and the nuclear industry

098-1

098-1 The HALEU EIS analyzes the potential impacts of the Proposed Action of acquiring, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production. The public's perception of the nuclear industry and the specific incidents cited in the comment are outside the scope of the HALEU EIS. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

can't be overstated.

The Nuclear Regulatory Commission's major function is regulation. That's why it's in the name. That's why you are separated from the Atomic Energy Commission. And yet we see increasingly you being pushed into the role of the old Atomic Energy Commission of both promoting and trying to regulate this industry.

This is a recipe for disaster. And the basic idea is that, or what the public basically is seeing are sweetheart deals, back room deals, as was alluded to by several of the people here.

Much of the information in the EIS is not transparent. It's not clear how we've come to the conclusion that most designs are going to require HALEU. It's not clear where you're getting any of your information. It creates the impression that the NRC is in closed meetings with the industry and locking out the public.

And just like with House Bill 6, what we had then was testimony from many people in the public who were opposed to that. And unbeknownst to us, the regulators, the legislatures who were listening spent three days listening to our

098-1 (cont'd)

098-2

098-2 The U.S. Department of Energy (DOE) is the lead agency preparing this EIS. The Nuclear Regulatory Commission is not a cooperating agency on the preparation of this EIS. However, if the Proposed Action were implemented, DOE does expect that the NRC could have a role in certain activities (e.g., reviewing forthcoming license requests from commercial entities).

098-3

098-3 The EIS identifies the need for HALEU commercialization in relation to development of advanced nuclear reactors. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of this CRD. The source of the information for reactors requiring HALEU is documented in the Technical Report that was prepared by Leidos for DOE. There are a number of proposed reactors that plan to use HALEU: X-energy, Oklo, Kairos, Westinghouse, and Ultra Safe Nuclear have plans to use HALEU (Section 8.1.3) (Leidos, 2023).

098-1 (cont'd)

testimony, overwhelmingly opposed to House Bill 6, never had any intention on acting on what we were saying. Because they were basically being bribed by FirstEnergy.

And I just want to emphasize again the importance of considering the no action alternative and remembering that the closer the NRC is seen with the industry it's supposed to be regulating, the less trust people have in government altogether.

MS. LOWE: Thank you, Mr. DeMare. Am I saying it right, DeMare?

MR. DEMARE: I say DeMare.

MS. LOWE: Okay, thank you.

So we have ten more minutes in this scheduled meeting. So if you're interested in commenting before we stop at 7:45, please let us know and raise your hand.

(Pause.)

MS. LOWE: Oh, Michelle Lee has raised her hand.

MS. LEE: Hi, again, just so we don't have to keep listening to crickets, I'll make one final point. Along the lines of the agency needing to look at the best available evidence,

098-1 (cont'd)

098-4

099-1

098-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. This *Environmental Impact Statement for Department of Energy (DOE) Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)* is a DOE activity. DOE expects that the NRC would be the regulatory authority involved in future licensing and permitting of HALEU facilities, following the environmental analysis done in this EIS. However, NRC is not involved as a coordinating agency or as the leadg agency on this EIS. DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

099-1 Section 4.3.2 of the HALEU EIS identifies observations and projections of climate change in the United States. It acknowledges that there are anticipated future climate change and environmental impacts for regions of the United States that encompass the numerous potential locations of the Proposed Action activities. Due to the large number of activities and potential facilities evaluated in the HALEU EIS, and the uncertainty of the numbers and locations of facilities, specific climate change adaptation measures for each location are not described in the HALEU EIS. However, DOE does expect that site-specific environmental reviews by the relevant regulatory authority would identify climate adaptation measures that would mitigate the effects of climate change on proposed HALEU activities at those locations.

one area where that is glaringly absent in the report is the review of the risks associated with climate change.

And these should be fully and comprehensively looked at. And I urge the DOE to consider the recent GAO report that was just released yesterday on nuclear power plants. NRC should take actions to fully consider potential effects of climate change.

It's an excellent report, but I would add that some of what it talks about actually is even outdated, because it's relying in large part on some government reports and studies that are already outdated.

Because with the acceleration of the effects of climate change, including things such as increasing -- these ferocious wildfires, and floods, and storms which we're dealing with today, probably a lot of us on this webinar right now or Zoom call. We should be mentioning the fact that climate change is an issue. It's not an analysis.

And while you're limited in how you can evaluate things, given the utter lack of specifics for sites and types of reactors, I

099-1 (cont'd)

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mean, types of facilities, you can still make some of the general points that are consistent with the best available science, and the climate risks, and the hazards, which would include informing the public as to the worst possible case scenario that is plausible. And that would have to include an evaluation of multiple climate events occurring concurrently. That has happened multiple times in the last two years.

And what is the risk associated with that kind of phenomena is you have resources to mitigate events -- And you have roads inaccessible, and you have transportation infrastructure that can be absolutely destroyed. And that kind of analysis is absent in the existing report. Thank you.

MS. LOWE: Thank you again, Ms. Lee.

Five minute warning, with a reminder that we will resume at 8 o'clock with the second meeting this evening.

(Pause.)

MS. LOWE: We have officially reached the end of this public hearing. On behalf of the U.S. Department of Energy, I would like to thank you for your participation in the public comment

099-1 (cont'd)

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process for the HALEU Environmental Impact Statement.

I would like to emphasize that DOE will be accepting comments via email and mail until April 22nd, 2024. And as a reminder, written comments should be sent to Dr., excuse me, Mr. James Lovejoy, who is the DOE's EIS document manager, by mail to U.S. Department of Energy, Idaho Operations Office, located at 1955 Fremont Avenue, Mail Stop 1235, and that's in Idaho Falls, Idaho, 83415.

Also you can use the email address of haleu-eis@nuclear.energy.gov. Those same addresses can be used to request being added to the mailing list for project notifications. For more information, including the slides that were used for this evening's presentation, those are available on the project website which is https://www.energy.gov/ne/haleu-environmental-impact-statement.

Let the record reflect that it is now 7:46 p.m., and we will adjourn this hearing. Thank you so much for participating this evening.

(Whereupon, the above-entitled matter went off the record at 7:48 p.m.)

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C E R T I F I C A T E

This is to certify that the foregoing transcript
In the matter of: Draft EIS in Support of HALEU
Before: U.S. Department of Energy
Date: 04-03-24
Place: Herndon, Virginia
were duly recorded and accurately transcribed
under my direction; further, that said transcript
is a true and accurate record of the proceedings;
and that I am neither counsel for, related to,
nor employed by any of the parties to this action
in which this deposition was taken; and further
that I am not a relative nor an employee of any
of the parties nor counsel employed by the
parties, and I am not financially or otherwise
interested in the outcome of the action.

Court Reporter

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Comments from the Draft HALEU EIS Public Hearing
2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 8PM

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF NUCLEAR ENERGY

+ + + + +

DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR DEPARTMENT OF ENERGY ACTIVITIES IN SUPPORT OF COMMERCIAL PRODUCTION OF HIGH-ASSAY LOW-ENRICHED URANIUM (HALEU)

+ + + + +

PUBLIC HEARING

+ + + + +

WEDNESDAY

APRIL 3, 2024

+ + + + +

The public hearing convened at 2300 Dulles Corner Boulevard, Herndon, Virginia 20171, at 8:00 p.m., Wendy Green Lowe, Facilitator, presiding.

PRESENT

WENDY GREEN LOWE, Facilitator
MICHAEL REIM, Program Manager

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Comments from the Draft HALEU EIS Public Hearing
2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 8PM

P-R-O-C-E-E-D-I-N-G-S

8:01 p.m.

MS. LOWE: Good evening, everyone, and thank you for joining us for this virtual public hearing. My name is Wendy Lowe, and I'd like to welcome you to this public hearing on behalf of the U.S. Department of Energy's Office of Nuclear Energy.

In compliance with the National Environmental Policy Act, the Department of Energy has published a draft Environmental Impact Statement which analyzes the impacts of DOE's proposed action to acquire high-assay low-enriched uranium, or HALEU, for commercial use and demonstration projects and to facilitate the domestic commercialization of HALEU production.

Before I get too far, I'd like to introduce Billy Sanders. Billy and his colleague, Catherine Willett, are providing American Sign Language interpretation for us tonight.

The goals of this public hearing are to explain the process used to analyze the proposed action and alternatives and to provide you, as members of the public, with an

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opportunity to submit oral comments on the draft Environmental Impact Statement.

In the first portion of this meeting, DOE's program manager for the HALEU program will tell you about the draft EIS. During the second portion, you will be invited to provide oral comments.

Both oral and written comments submitted throughout the 45-day comment period will be considered by the Department of Energy. Comments received during this time will help DOE refine its analysis, identify new information, and consider additional alternatives during development of the final Environmental Impact Statement.

Today is Wednesday, April 3rd, 2024, and the time is now 8:01 p.m. Eastern. This virtual public hearing is one of three that are being held this evening. The first hearing began at 6 o'clock p.m. Eastern and the third will begin at 10'oclock p.m. Eastern.

Please be aware that all three hearings are being recorded. The recordings of all three virtual hearings will be combined into one file and uploaded to the project website

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within two weeks of this hearing.

The information portion of this public hearing will begin shortly with a presentation by the Department of Energy's Program Manager, Michael Reim. His presentation was pre-recorded to make sure the information presented is consistent for all three sessions this evening.

The presentation will last approximately ten minutes and will provide information about the National Environmental Policy Act as well as background information about the proposed action.

For those calling in on an audio only device, I would invite you to go to the project website so you can see an uploaded version of the presentation slides. The project website is located at htts:www.energy.gov/ne/haleu-environmental-impact-statement. That link has also been provided in the chat for those of you who are participating online with Zoom.

Following the presentation, I will explain the procedures we will be using to take comments.

MR. REIM: Hello, and welcome to this public hearing. I am Michael Reim, program

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manager for the U.S. Department of Energy, Office of Nuclear Energy. And today we'll be talking about the draft Environmental Impact Statement for DOE activities in support of commercial production of high-assay, low-enriched uranium, also known as HALEU.

First in our DOE presentation overview I'm beginning with the National Environmental Policy Act overview. This will include the purpose of an Environmental Impact Statement, or EIS, comments received during the scoping period, and the purpose of public hearings in general.

Additionally, I'll be discussing the project background. This includes the purpose and need, the proposed action and alternatives, scope of activities, approach to the impact analysis, the impact analysis categories, and a summary of potential impacts.

First we'll begin with the National Environmental Policy Act. NEPA is a federal law that requires federal agencies to identify and consider the environmental consequences of implementing projects.

NEIS is prepared for proposed actions likely to have significant effects. NEIS also

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analyses the effects of a proposed action and is prepared before actions are taken that could limit the selection of an alternative or result in adversive environmental effects.

The NEIS process incorporates public input, which is why we're here today, and informs the public in decision making process which is the purpose of this presentation.

Additionally, the purpose of an Environmental Impact Statement is to identify the purpose and need for the proposed action, to identify alternatives, this includes a reasonable range of alternatives that meet the purpose and need, including the preferred alternative. This also includes a no action alternative.

It also describes the existing environment at candidate sites or variously affected by the alternatives. It evaluates the environmental consequences of the alternatives using the best available information, it identifies mitigation measures, and it evaluates direct, indirect, and cumulative impacts.

The scoping period for the HALEU EIS took place from June 5th, 2023, until July 20th, 2023. Four hundred and nine individual comments

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were identified. DOE reviewed each comment document, characterized the comments, and found the public wanted several topics to be covered in the draft EIS.

This list includes accidents and human health, alternatives, climate change, conversion, cost analysis, de-conversion, environmental justice, and Justice40, enrichment, environmental impacts, fuel fabrication, NEPA in general, non-proliferation, nuclear waste management, opposition to the project, out of scope comments, purpose and need for reactor technologies, regulatory concerns, spent fuel management, storage, support activities, transportation, and tribal consultation.

In response to the comments received, the DOE expanded discussions about how project locations would be chosen in the Reader's Guide in Section 1.0 in Volume 1, and they added a non-proliferation section in Section 3.9 of Volume 1.

Other topics raised were either already identified in the NOI, and covered in the draft EIS, or were deemed out of scope for the EIS.

Next I'll discuss the purpose of

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public hearings and the goals of public hearings. The purpose is to provide the public a forum to learn more about the draft table EIS and its proposed action as well as to solicit public comments prior to the final EIS.

The goals of the public hearings are threefold, to inform the public about potential environmental impacts of the proposed action and the alternatives, secondly, to seek feedback from stakeholders, including federal, state, tribal, local agencies, NGOs, and the public, on the draft EIS, and finally, to provide opportunities for stakeholders and other interested parties to make formal comments on the draft EIS.

Next, I'll discuss the project background for HALEU. One aspect of the Clean Energy Future is the sustainment and expanded development for safe and affordable nuclear power. And one key element of that goal is the availability of fuel to power those reactors.

HALUE is a crucial material required by most U.S. advanced reactors. Most designs require HALUE in order to achieve smaller designs, longer operating cycles, and increased efficiencies over current and clear energy

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technologies.

However, there are currently limited options for acquiring HALUE. HALUE is not currently available from domestic suppliers, and gaps in supplies could delay the deployment of advanced reactors in the time frame that supports the nation's net zero missions targets by 2050.

Currently, commercial nuclear fuel suppliers can't produce HALUE largely due to market uncertainties and infrastructure gaps. This poses a concern for the development, demonstration, and deployment of many advanced nuclear technologies.

To accommodate these gaps, and help meet the nation's net zero emissions targets, the Energy Act of 2020 directs the Secretary of Energy to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use.

Further, Section 3131 of the recently enacted National Defense Authorization Act for Fiscal Year 2024, among other things, seeks to expeditiously increase domestic production of

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HALEU to meet the needs of advanced nuclear reactor developers in the construction established under Section 2001(a) of the Energy Act of 2020.

The proposed action is to acquire, through procurement from commercial sources, HALUE enriched to at least 19.75 and less than 20 weight percent uranium 235 over a ten-year period of performance and to facilitate the establishment of commercial HALUE fuel production.

Given the variety of HALEU applications, the initial capability is intended to be flexible and to be able to accommodate a number of items, enrichments of U-235 to greater than five and less than 20 weight percent, production of up to 290 metric tons of HALUE at multiple enrichment facilities, modular HALUE fuel cycle design concepts, and to accommodate future growth, de-conversion of UF6 to forms suitable for production of a variety of fuels, and to include oxides and metal.

Under the no action alternative, DOE would not require fuel procurement from commercial sources up to 290 metric tons of HALUE

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or facilitate the establishment of commercial HALUE fuel production.

The EIS addresses six activities associated with the acquisition of 290 metric tons of HALUE, extraction and recovery of uranium ore processed to yellow cake, conversion of the yellow cake in the UF6, enrichment including enrichment to no more than five weight percent, enrichment greater than five and less than ten weight percent, and enrichment from ten to less than 20 percent of U-235 in an NRC Category 2 facility.

It also includes de-conversion of UF6 to uranium oxide, metal, and potentially the other forms in a Category 2 facility, storage in a Category 2 facility, and transportation of uranium between facilities.

In addition to the previous activities, the EIS discusses three reasonably foreseeable activities that could result in the implementation of the proposed action. This includes fuel fabrication for a variety of fuels, reactor operation including demonstration tests, power, and isotope production, and spent fuel storage and disposition.

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While not specifically a part of the proposed action, the impacts from these reasonably foreseeable activities are acknowledged and addressed to the extent practicable.

One contributing factor to the significance of environmental impacts is where facilities are located. However locations will not be chosen as part of the record of decision for this EIS, as potential HALUE fuel cycle facilities are subject to an ongoing procurement process including responses to requests for proposals.

To determine the potential environmental consequences without site-specific information, DOE evaluated existing NEPA documentation for uranium fuel cycle facilities used in a low enriched uranium fuel cycle as well as available HALEU fuel cycle NEPA reviewed.

The activities described in the proposed action are not unique. Extensive NEPA evaluation documentation exists for environmental consequences of similar activities. Since the proposed action is to require HALEU from commercial sources, those commercial sources

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could propose a range of location scenarios for producing HALEU.

Scenarios could include the use of existing uranium fuel cycle facilities with modifications or expansions. It could include construction and operation of a new facility at an existing industrial site, or brownfield site, and it also could include the construction and operation of a new facility at a previously undisturbed site, or greenfield site.

To estimate potential impacts associated with the proposed action, this EIS's subject matter experts leveraged the extensive existing NEPA documentation's impact assessments and determined relative impacts associated with performing these activities at existing facilities, brownfield sites, or greenfield sites, using the NRC's impact assessment categories.

Potential modification, construction, and operation of HALUE fuel cycle facilities would be subject to UI Regulatory Commission, another federal agency, or agreement state licensing, including NEPA review and potentially other federal and state permitting.

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This EIS adopts the NRC impact assessment categories from the NEPA documents that were used as the basis for the impact analysis. Small impacts are not detectable or are so minor that they neither destabilize nor noticeably alter any important attribute of the resource.

Moderate impacts are sufficient to alter noticeably but not destabilize important attribute of the resource. And large impacts are clearly noticeable and are sufficient to destabilize important attributes of the resource.

This slide summarizes the impacts of siting a HALUE facility at the fuel location scenarios analyzed in this EIS. For existing uranium fuel cycle facilities, most impacts would be small. The greatest potential for large impact is associated with mining and milling. And impact levels are mine-specific.

For other industrial sites, or brownfield sites, impacts are generally arranged from small to moderate with potentially large impacts in areas associated with site demographics and historic cultural and ecological resources.

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For previously undeveloped or greenfield sites, the locating at brownfield sites with potentially larger impacts than brownfield due to increased unknown site characteristics predominately pertaining to historic, cultural, and ecological resources.

This concludes the end of the presentation portion of the meeting. And I'd like to thank you again for your participation in the EIS process.

MS. LOWE: Thank you, Mr. Reim. That concludes the information portion of this virtual hearing. Next we will begin accepting comments on the draft Environmental Impact Statement.

As the moderator, it is my job to make sure that this hearing is conducted in a respectful manner and ensure that we provide a fair opportunity to provide oral comments.

Michael Reim will be listening to the comments on behalf of the Department of Energy. But please understand that he and other viewing representatives are here to listen. They will not be responding to any comments during this hearing.

A court reporter is also present off

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screen to transcribe these commenters at this hearing. Please try to speak clearly into your microphone to help ensure the court reporter can accurately record your comments.

I'd like to emphasize that providing oral comments during this virtual public hearing is only one of the ways you can participate in the EIS process. You may also submit written comments by sending them via U.S. mail or by email.

Written comments on the draft EIS can be sent to Mr. James Lovejoy, who is DOE's EIS document manager, and mailed to U.S. Department of Energy, Idaho Operations Office, located at 1955 Avenue, excuse me, Fremont Avenue, Mail Stop 1235, in Idaho Falls, Idaho 83415. If you prefer, you're welcome to send comments via email to haleu-eis@nuclear.energy.gov.

Those same addresses can be used to request to be added to the mailing list for project notifications. DOE will consider all comments received or postmarked by the end of the public comment period which will end on April 22nd, 2024.

All comments will be given equal

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consideration regardless of whether they are submitted orally or in writing. The comments received throughout the comment period will be compiled and incorporated into a comment response document.

The comment response document will include DOE's responses to comments that have been received, and it will be included in the final Environmental Impact Statement.

The opportunity to provide comments in the draft EIS began with the publication of the notice of availability on March 8th, 2024. The notice of availability included information about how commenters could pre-register to provide oral comments during this session.

As we begin the oral comment portion of this hearing, we have 17 people who have registered to speak. And we'll begin by taking their comments first.

If you're interested in providing comments during this public hearing but didn't register ahead of time, we will do our best to provide an opportunity for you to comment as well. You can let us know that you're interested in commenting by using the raised hand function

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in Zoom.

Zoom keeps track of people who raise their hands in order, and we will call on you on a first come, first serve basis. Time permitting, we will allow those with raised hands to provide oral comments after hearing from the pre-registered attendees. If you're calling in by telephone, you may also raise your hand by dialing *9.

To allow a fair opportunity to speak to as many people as possible, oral comments will be limited to three minutes per speaker. To help you keep track of time, a digital count-down clock will be provided on screen.

This session is scheduled to go until 9:45 p.m. Eastern. If there's time remaining before we are scheduled to end this session, we may provide the opportunity for anyone who has already spoken to have a second opportunity to provide comments.

I will call the names of two people at a time to give you a bit of notice when it's almost your turn to speak. When I call on you to provide your comments, our technical support team will unmute your microphones.

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Please begin by stating your name and the name of any organization that you are representing in an official capacity tonight. Your three minutes will begin at that point.

Regardless of whether you registered to speak ahead of time or have raised your hand to speak, if you change your mind about speaking please let us know while you're unmuted, and I will move on to the next person in the queue.

We recognize that three minutes is a brief amount of time. I would encourage you to provide more detailed comments in writing to ensure that all of your thoughts, concerns, and suggestions on the draft EIS can be fully captured in the record.

I will let you know when you run out of time. If you're still speaking once your three minutes are up, I will ask you to conclude your remarks, and then I will call on the next speaker.

Please understand that if we do have to cut you off, to ensure that we can hear from as many people as possible, and that everyone who wants to speak during the public hearing has a fair opportunity to do so, we will accommodate as

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many people as we can until 9:45 p.m. Eastern time.

One final request I'd like to make of you tonight, I know that there are some of you who may have strong opinions about DOE's proposal. We hope that everyone will share their opinions in a respectful manner.

One of the main purposes of a public hearing is to give each of you an opportunity to provide their thoughts to DOE about the draft Environmental Impact Statement. We're grateful that you take the time out of your busy schedules to participate in this virtual public hearing. And with that, we will begin taking comments.

So on the list for this particular session, the first person is Bryn Hammarstrom. And Bryn will be followed by Jay Jones.

Is Bryn with us?

(Pause.)

MS. LOWE: Okay. Jay Jones will be followed by Dale Deware.

(Pause.)

MS. LOWE: Dale Deware will be followed by Diane D'Arrigo.

MS. DEWARE: Okay, I unmuted myself.

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Comments from the Draft HALEU EIS Public Hearing
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MS. LOWE: Oh, okay, very good.
MS. DEWARE: Okay.
MS. LOWE: Start with your name.
MS. DEWARE: Dale Deware.
MS. LOWE: Okay, thank you, Dale.
MS. DEWARE: And I'm from Canada, and I work with the International Physicians for Prevention of Nuclear War Canada.
I don't know how I got on your speakers list, because I didn't actually apply, ha, ha. So if you don't mind, I would like to keep my comments. I may want to put my hand up later.
MS. LOWE: Okay, that's fine.
MS. DEWARE: But thank you very much.
MS. LOWE: We won't force you to speak.
Okay. Diane D'Arrigo, followed by --
MS. D'ARRIGO: Hi.
MS. LOWE: -- Jan Boudart.
MS. D'ARRIGO: Hi, I'm Diane D'Arrigo with Nuclear Information and Resource Service. We have opposition to the production of HALUE.
DOE's projections of HALUE demand are

100-1

100-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Section 1.1 of the EIS in which DOE has clarified the purpose and need, including the basis for the projections of HALEU needed. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. See also Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of the CRD for further discussion of these topics.

entirely unrealistic. The amount of capacity from HALUE-dependent reactor designs on which DOE's EIS is based are unrealistic and are potentially science fiction. There's no evidence that these reactors will be licensed, or certified, or built.

The companies promoting reactor designs that would run on HALUE are in a chicken and egg position for widespread marketing of their designs. What we've got is we have no HALUE, and we have no reactors or designs certified or licensed by the NRC that can use HALUE.

So what it appears that DOE is doing here is just trying to use tax money to bolster a whole scheme that is objectionable. And part of the EIS should be addressing the fact, in the no action alternative, for not proceeding with it.

So the companies are in a chicken and egg position. And if they try to promote their designs on a business level, they are entering the business at their own risk. But the Department of Energy here is using our tax money to make something that wouldn't be economically viable.

100-1 (cont'd)

100-2

100-3

100-2 DOE acknowledges your preference for the No Action Alternative. DOE reiterates the Council on Environmental Quality (CEQ) statement: "Commenting is not a form of 'voting' on an alternative" (CEQ 2021). The number of comments received for or against a particular alternative does not dictate the action that a Federal agency must take. The allocation of Federal funds to support any activity is the responsibility of the U.S. Congress. In the Energy Act of 2020 and subsequent legislation, Congress directed and funded DOE to pursue the commercialization of the HALEU fuel cycle. Decisions to support development of other means to address climate change are independent from decisions based on the HALEU EIS.

100-3 Please see response to Comment 100-1.

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Industry requires a fuel that isn't commercially available at a scale necessary to support wide deployment of the reactor designs. But the number of potential projects in the pipeline is very small. And none of the companies have demonstrated their commercial or technical viability.

If HALUE enrichment and production capacity can be scaled to industry demand, then it does not require DOE to sponsor it. The billions of dollars of taxpayer investment that would be at risk is unjustified.

It is not a viable business plan. DOE is woefully negligent in managing the existing massive stockpiles of depleted uranium. And this waste will be even much more intense. The high level waste that would result would be much more radioactive.

And this doesn't even begin to address the proliferation dangers. We've been risking more with Iran over the uses of centrifuge enrichment to produce HALUE over a decade. And the non-proliferation regime may not be able to withstand the hypocrisy of the U.S. building commercial HALUE capacity.

100-3 (cont'd)

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100-4 Depleted uranium is not a waste. It is a resource being stored for future use as needed. The DOE depleted uranium inventory is maintained consistent with all Federal, state, and local requirements. Conversion of depleted uranium hexafluoride (DUF_6) to depleted uranium oxide (DU oxide) is ongoing at the Portsmouth and Paducah Sites. Construction and operation of these facilities were evaluated in the *Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio, Site (DOE/EIS-0360)* and the *Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky, Site (DOE/EIS-0359)*. The depleted UF_6 from the Proposed Action would be a small percentage of that currently being converted at these two sites. High-level waste is generated from the reprocessing of spent nuclear fuel. Commercial SNF is not currently being reprocessed in the US and is not proposed in this EIS. Therefore, no high-level waste will be produced as a result of the Proposed Action. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

100-5 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of

And as I said, the HALUE irradiated fuel will be much more radioactive and complicated. And it's an unresolved problem already.

MS. LOWE: Thank you, Ms. D'Arrigo. I'm going to say it wrong, D'Arrigo.

MS. D'ARRIGO: D'Arrigo, and it's Nuclear Information and Resource Service. You're welcome.

MS. LOWE: Thank you.

Okay, Jan Boudart followed by Jean Nichols.

MS. BOUDART: I am Jan Boudart, a member of the Nuclear Energy Information Service. But these comments are my own personal observations and not from NEIS.

On Page 1 of the readers guide to the draft Environmental Impact Statement for DOE activities in support of commercial production of high assay low enriched uranium, the summary, it says the production of HALUE under DOE's proposed action would require the following activities, the first of which is uranium mining and milling. But U mining and milling is not one operation but three operations. And two of these should be

100-6

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Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

100-6 Since the HALEU fueled reactors and the associated fuel are not yet defined, the specific characteristics are unknown and therefore were not analyzed. However, disposition is expected to be a part of future licensing and permitting reviews and approvals that will be supported by the appropriate NEPA when those evaluations are ripe for a NEPA assessment. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNFWhile outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting

listed separately, mining and milling.

The third operation, transportation, is later in the same list. In situ mining and recovery of U oxide, or yellow cake, with transportation to Metropolis Illinois, that's Superman's home town on earth, should have its own section in the EIS.

The sample listing of mining and milling obfuscates their separate contamination sites, the mine, and the mill, and the contamination of the road in between.

One example of several that could be sited is the Pinyon Plain mine near Grand Canyon in Arizona and the White Mesa Mill in Utah, 260 or 360 miles distant depending on the route.

Energy Fuels, a company based in Montreal, Canada, claims ownership of both sites. There are three possible routes that start at the mine and go north through the Hopi and Dene nations. The trucks carrying radioactive ore are required to have only a tarp cover.

This means that the radioactive dust and stones probably will be spread along the Interstate going through Indian lands. Children and families live there and cross the highway to

101-1 (cont'd)

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effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

101-1 The initial step in the production of HALEU is the extraction and recovery of uranium ore into "yellowcake." As discussed within the EIS and the Technical Report, the EIS considers two uranium mining extraction methods: (1) in-situ recovery (ISR) mining, which is the predominant extraction method currently used in the United States for uranium recovery, and (2) conventional mining, which includes open-pit and underground mining. For ISR mining, the uranium ore is oxidized from insoluble tetravalent uranium to highly soluble hexavalent uranium (U_3O_8) and is further processed at on on-site central processing plant, which uses ion exchange to extract the uranium ions from the liquid and subsequently produces yellowcake. For conventional mining, yellowcake is not produced on-site, rather this mining method requires the ore be transported to a mill where it is crushed and processed to concentrate the uranium. Although the EIS considers mining and milling as single step in the production of HALEU to obtain the yellowcake, the Technical Report (Leidos, 2023) does consider three separate activities of ISR mining, Conventional Mining, and Milling. Please refer to Section 1.3 of the Technical Report for further information on potential impacts by resource and Section 3.1 of the EIS for information on the potential impacts of mining and milling.

101-2 See the response to Comment 047-2.

get to destinations in their territory. The tribes have been able to forbid transportation on their local roads, but the Interstate is beyond their control.

What about the possibility of an accident on Interstates 160 and 191 which have long stretches through tribal lands? And this is just one example of two contaminating processes with a very likely contaminated transportation route in between.

Nuclear fuels have several examples of mining and milling sites. Mining and milling are two processes and should be evaluated separately. Therefore, I earnestly request that the DOE separate them, and that the EIS treat each of them in environmental analysis, and their transportation routes be subject to analysis the same as any other process in the supply chain.

Leach mining deserves its own section of the EIS separate from pick and shovel mining. Thank you.

MS. LOWE: Thank you, Ms. Boudart.

Jean Nichols will be followed by John Sonin?

(Pause.)

101-2 (cont'd)

101-3

101-3 In-situ leaching (ISL) or leach mining is also called in-situ recovery (ISR) mining. The Technical Report (Leidos, 2023) does consider three separate activities of ISR mining, conventional mining, and milling. Please refer to Section 1.3 of the Technical Report for further information on potential impacts by resource. Please see responses to Comments 047-1 and 047-2.

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MS. LOWE: John Sonin will be followed by Judith Beckman.
(Pause.)
MS. LOWE: Judith Beckman will be followed by Kalene Walker.
(Pause.)
MS. LOWE: Kalene Walker will be followed by Kathy Helms.
(Pause.)
MS. LOWE: Kathy Helms will be followed by Karen Bonime.
(Pause.)
MS. LOWE: Karen Bonime will be followed by Mark Fallston.
(Pause.)
MS. LOWE: Mark Fallston will be followed by Ichael Keegan.
(Pause.)
MS. LOWE: I believe it's Ichael, I'm not positive, Keegan, followed by Mikaela Buscher.
MR. KEEGAN: Michael Keegan here.
MS. LOWE: Oh, good.
MR. KEEGAN: Can you hear me?
MS. LOWE: Oh --

Response side of this page intentionally left blank.

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MR. KEEGAN: Thank you.

MS. LOWE: -- I'm missing an M. And you're welcome to go ahead.

MR. KEEGAN: Thank you. Michael Keegan with Beltways, Michigan. I'm in my 44th year of tracking the nuclear power industry. In February of 2015, I sat in on a stakeholder, DOE, NRC meeting where the DOE was encouraging recall of new reactors with pursuing a higher level of fuel.

Five to ten percent was prime plus, where the ten to 20 was the HALUE, and then reprocessing. But there would be no rulemaking on any of this. When I asked why no rulemaking, the DOE, NRC was, well, there just wasn't the interest at this time.

It's a chicken and egg situation. We've got to have the fuel ready for when the small reactors get there. Certainly the DOE is pushing this type of fuel where the designs don't even exist.

I mean, I have concerns that this is really a Trojan horse for proliferation. By virtue of having HALUE enrichment at 20 percent U-235, virtually 85 to 90 percent of the cost and

102-1

102-2

102-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Regarding comments about the speculative nature of the advanced reactors, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's response.

102-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU.

DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation

the labor to take it to weapons grade has been omitted and is embedded.

At Centrus in Ohio, they spent $274 million to fulfill a demonstration project where they've generated 44 pounds of HALUE. That comes out to about $6.2 million per pound.

The production is now halted. They can't have a production line of 900 kilograms of HALUE, because they do not have the canisters to hold the HALUE. They do not have B5 canisters.

A special room was built to prevent criticality when the HALUE came out of production. There's no way to transport -- no transportation exists for this level of enrichment without risking a criticality accident.

None of these pieces are in place. And so there's no economic argument for HALUE. This is proliferation. This is a military agenda. And it's easier to move to a rulemaking process where there could be hearings, protracted hearings. Thank you.

MS. LOWE: Thank you, Mr. Keegan. I'm sorry that I mispronounced your name.

Michaela Bushcer followed by Pat

102-2 (cont'd)

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and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

102-3 Centrus successfully completed delivery of the HALEU for the first phase of the demonstration project. Regarding commenter's concerns about type 5B cylinders, these cylinders were used to receive the HALEU produced by Centrus. The Type 5B cylinders meet the requirements of ANSI N14.1-2001, Packaging of Uranium Hexafluoride for Transport. Shortages of containers is expected to be a temporary condition caused by supply chain issues. Delays due to the shortage of containers do not alter the evaluation of impacts presented in the HALEU EIS.

102-4 Certified transportation packaging is available for various forms of uranium with varying degrees of enrichment. The packaging is designed to protect the contents in accident conditions and prevent criticality accidents. Specifically, there are three certified (or to be certified) designed shipping containers that were evaluated for the transport of HALEU products as listed in Section A.6 of the HALEU EIS and in Section 6.4 of the referenced Technical Report (Leidos, 2023). See also Section 2.6, "Transportation," of the CRD for additional information.

102-5 The Energy Act of 2020 states that the HALEU is for civilian domestic use. As described in Section 1.0.2, "Why Do We Need More HALEU?" of the HALEU EIS, the Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use. DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs,

Marida.

(Pause.)

MS. LOWE: Pat Marida followed by Patrick Hynes.

(Pause.)

MS. LOWE: That's the end of the list of pre-registered commenters. I'm going to recall the people that haven't responded yet, in case they've joined us since we started.

Bryn Hammarstrom? Jay Jones? Jean Nichols? John Sonin? Judith Beckman? Kalene Walker? Kathy Helms? Mark Fallston? Mikaela Buscher? Pat Marida? Patrick Hynes?

I'd like to remind everyone that if you didn't pre-register to speak it's not too late. We just need you to raise your hand using the hand function in Zoom to let us know you're interested.

And if you already spoke during this session and would like to speak again, let us know by raising your hand, and we'll call on you the second time.

Okay, I see a hand up. Dan Solitz? You need to unmute your -- there we go. Go ahead, and speak.

and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

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MR. SOLITZ: Hello. Hi, good afternoon. Here in Eugene, Oregon, I'm representing myself. I tuned in too late for the presentation. But the Navy's been moving this stuff around for quite a while, and it's much more concentrated.

So I think it can be done, the question is should it be done. And that really needs a whole different venue that's probably political to decide that.

I guess what concerns me most about this whole genre is the waste and dealing with it, dealing with the waste, and transporting the waste. And the DOE would do a service to everybody if they would try and get more information out about how they plan to deal with and transport the waste.

They really need to get together with the communities that the waste is going through, and the governors' associations, and all that to kind of get those ducks in a row before starting loading some different, more exotic fuels.

So anyway, I submit these comments for your and your parties' consideration. Thank you.

MS. LOWE: Thank you, Mr. Solitz.

103-1

103-1 SNF has a long history of being safely managed and that management is subject to extensive regulatory requirements. These requirements address. packaging, transportation, and interim storage. The characteristics of the various potential HALEU fuel assembles and therefore the associated characteristics needed for analytical evaluations cannot be known at this time and not ripe for any NEPA evaluations. When a HALEU fuel assembly design is prepared, the cognizant regulatory authority will perform the NEPA evaluation as part of the licensing and permitting processes. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the

The presentation slides that were shared earlier are available online. And I'll ask the folks from in the chat to post the link for that presentation for you if you'd like to go online and see those.

MR. SOLITZ: Yes, thank you.

MS. LOWE: Let me see if any hands are going up. We are scheduled to go until 9:45, and we will be available until that time. So we will be here, ha, ha, ha. If you're interested in providing a comment, please raise your hand and let us know.

(Pause.)

MS. LOWE: We have a hand up, Joseph DeMare would like to provide a comment. You can go ahead, Mr. DeMare.

MR. DEMARE: Yes, thank you. Joe DeMare, co-chair of Wood County Green Party, Ohio.

I just wanted to mention that Page 1-13, Table 1.1-1, the Nuclear Energy Institute survey results for estimated HALUE demand through 2035, they are estimating that there should have been a 1.8 metric ton demand in 2022, a 7.7 metric ton demand in 2023, 18 metric ton demand

104-1

management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information.* Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," and Section 2.6, "Transportation" of this CRD for a discussion of these topics.

104-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Section 1.1 of the EIS in which DOE has clarified the purpose and need, including the basis for the projections of HALEU needed. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. See also Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of the CRD for further discussion of these topics. Note that if for some reason the HALEU was never used, it could be blended down to LEU and used in existing commercial power reactors. It would not need to be "isolated from the environment for hundreds, of thousands of years" as suggested by the commenter.

in 2024. So our two million total at this time should have been 27.5 metric tons.

As I understand it, there are no reactors currently using HALUE in the United States of America. And so these estimates are all wrong. And the way they increase exponentially after that, going up to 700 metric tons by 2030, would also be wrong. So this, once again, suggests that the target that the DOE has established for creating HALUE is wildly over-estimated.

And as I pointed out in the last hour, the production of HALUE, since HALUE itself is a dangerous substance, both chemically and radioactively, the protection of the public demands that you don't create more of it than you need. And so there has to be a process for attenuating production.

I disagree with the need to have HALUE, as I've stated before. Renewables are rapidly replacing nuclear energy around the world. And by 2030, according to the current projections, renewables will be so cheap and so abundant, as will storage of various technologies, that no one will want to be

104-1 (cont'd)

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building these HALEU nuclear reactors.

But if you're going to insist on creating the potential or the capacity to create it, you don't also need to stockpile hundreds of metric tons of toxic radioactive fuel which will never be used.

So there's a difference between creating the capacity to make it and then actually creating it and storing it. And again, even if it's never used, it will have to be isolated from the environment for hundreds, of thousands of years. So that's my comment.

MS. LOWE: Thank you, Mr. DeMare.

We will go back into recess until a hand goes up.

(Pause.)

MS. LOWE: We have a hand up. So Dan Solitz has his hand up. Mr. Solitz, you can go ahead.

MR. SOLITZ: Okay. Thank you. I don't want to be pest, but I really like this format. It gives me time to think.

Is it possible to post a link for the comments after the scoping of this EIS?

MS. LOWE: We are not taking questions

104-1 (cont'd)

105-1

105-1 DOE acknowledges your comment about the meeting format. Section 1.2, "DOE Notice of Intent and Opportunity for Comment on EIS Scope," in Volume 1 describes changes made to the EIS based on the scoping comments received. Please also see Section 4.0, "Scoping Comment Summary," of Volume 3 for a summary of comments received during the scoping period.

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tonight.
MR. SOLITZ: Okay.
MS. LOWE: But I believe they're included in the draft EIS.
MR. SOLITZ: They are? Okay.
MS. LOWE: Yes.
MR. SOLITZ: Thank you.
MS. LOWE: I hope I'm correct.
MR. SOLITZ: Thank you.
MS. LOWE: So if you go to the link for the draft EIS --
(Simultaneous speaking.)
MS. LOWE: -- and the project website is on the slide that has -- it's in the chat. We sent that to you already, right?
MR. SOLITZ: Oh, yes. Yes, I reviewed it. I saw it.
MS. LOWE: Yes.
MR. SOLITZ: Okay, but it's the EIS.
MS. LOWE: Okay.
MR. SOLITZ: Thank you.
MS. LOWE: Did you want to say anything else?
MR. SOLITZ: Well, just again, we have nuclear waste. It has to go somewhere. It can't

105-2

105-2 The uranium ore mined and processed to produce the HALEU under the Proposed Action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no mining or milling wastes with unique characteristics. All these wastes have a path to disposal. Waste quantities generated would represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See Section 2.6.1.10. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the

stay where it's at. And it'll take you 100 years maybe, but basically it has to end up somewhere.

So, integral to all of these assessments by the DOE, there needs to be some -- and I know you're working on it. But just so there'll more accepting, willingness to drive across the country.

Because there's a lot of places where it's at now. It's just been thinking of it up on the Columbia River at the reservation. But we'd like to get that away from the Columbia. There's geologically better spots for it. And there's one that was just -- I think there's something like that in California.

And the media people just jumped on the transportation issue, as well as the storage issue, so a lot of work ahead. Thank you.

MS. LOWE: Thank you, Mr. Solitz.

Okay, we'll go into recess again. We're still here. Raise your hand if you're interested.

(Pause.)

MS. LOWE: Someone named Kathy Helms has put a chat message in. It says her mic isn't working. And she wants to make a comment. So

105-2 (cont'd)

management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

I'm going to read her comment so it goes into the record.

The mic on my computer isn't working. But as was referenced previously in regard to basically putting the cart before the horse, here is a post from the American Nuclear Society about a meeting tomorrow, April 4th, to identify codes and standards to deploy advanced reactors. Officials from entities including the American Nuclear Society are set to attend.

The goal of our collaboration is to proactively identify codes and standards applicable to an array of non-traditional reactor designs. NRC's Chair, Christopher Hansen, says this effort will make the NRC's licensing and oversight of these technologies timelier and more efficient.

And she says the full story is available on Nuclear Newswire, which is a publication of the American Nuclear Society, on March 25th. I believe this is what it says.

MS. LAWSON: Hey, Wendy, you missed a couple of lines. Can you read it again?

MS. LOWE: I did? Yes, I'm so sorry.

Response side of this page intentionally left blank.

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Okay. NRC, INL plants -- want me to start all the way over at the top?

MS. LAWSON: Yes.

MS. LOWE: Okay. The mic on my computer isn't working. But as was referenced previously in regard to basically putting the cart before the horse, here is a post from the American Nuclear Society about a meeting tomorrow, April 4th, to identify codes and standards for non-traditional reactor designs, NRC, INL planned event on advanced reactor codes and standards.

The Nuclear Regulatory Commission and Idaho National Laboratory have scheduled an event for April 4th that will focus on leveraging consensus codes and standards to deploy advanced reactors. Officials from entities, including the American Nuclear Society, are set to attend.

The goal of our collaboration is to proactively identify codes and standards applicable to an array of non-traditional reactor designs. NRC Chair Christopher Hansen says this effort will help make the NRC's licensing and oversight of these technologies timelier and more efficient.

106-1

106-1 The commenter refers to a previous reference about "putting the cart before the horse" and then describes an event to identify codes and standards for non-traditional reactor designs. DOE assumes the comment relates to preparing an EIS for the proposed activity to commercialize HALEU before advanced reactor designs have been completed. The EIS identifies the need for HALEU commercialization in relation to development of advanced nuclear reactors. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of this CRD. In relation to the information about the event for codes and standards for non-traditional reactor designs, codes and standards contain technical requirements, safety requirements, guidelines, characteristics, and recommended practices for performance. In order to ensure the design of advanced nuclear reactors for safe operation, codes and standards must be considered and updated as necessary to include information that develops as reactor designs progress. Part of the process is to understand how current codes and standards meet the needs for inherently safe designs for advanced nuclear reactors. When current codes and standards are not adequate for designing advanced nuclear reactors, the codes and standards need to be updated. The updated codes and standards can then be factored into the advanced reactor designs. The ultimate goal is to ensure codes and standards support the design and safe operation of advanced nuclear reactors. However, consideration of codes and standards for advanced nuclear reactor designs is out of scope for this EIS.

So that's the end of the comment.
(Simultaneous speaking.)
MS. LOWE: So Joseph DeMare's hand is up again.
MR. DEMARE: Yes, thank you. Part of what this Environmental Impact Statement does is it describes in situ mining processes and other processes that are involved in the milling, mining, and production of the HALUE.
I want to refer back to my comments during the first hour that the Department of Energy claims in summary that these processes have been done safely for many generations, or for many years.
And as I listed in the first hour, there are many, many examples of the fact that it has not been done safely, that it has, in fact, resulted in severe contamination in many different places around the country.
What I'm asking for in the final Environmental Impact Statement, in fact, is an accounting.
In fact, if we list all the places in the United States where the processes needed to make HALUE have been done, and list how many of

107-1

107-1 DOE acknowledges the occurrence of legacy contamination that has occurred from past uranium activities and your concerns. Please see Section 2.4, "Legacy Issues," of the CRD for additional information about this issue. The uranium ore mined and processed to produce the HALEU under the Proposed Action is a small percentage of the uranium ore mined as part of ongoing LEU activities. There are no wastes with unique characteristics. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See Section 2.6.1.10. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, HALEU Spent Nuclear Fuel Storage and Disposition, HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside

them have had contamination of various sorts and various levels, because we need, in order to correctly assess the environmental impact of the proposed HALUE fuels, we need to look at the actual impact of the fuels that have been made so far, fuels which, since they're lower in U-235, are less dangerous.

We're talking about making a fuel which is much more dangerous and much more unstable. And yet the Department of Energy simply claims it has made the lower assay fuel safely in the past.

But I believe that if the DOE were to include a comprehensive history of the spills and contaminations that have happened around the country, it would become clear that that statement is false.

And therefore, in determining whether or not to create a new fuel cycle, according to NEPA, you would have to have a correct assessment of the risks involved. And those risks are high enough, I believe, and if a history is included, it will clearly show that the no action alternative is better in terms of protecting the United States of American and its citizens.

107-1 (cont'd)

107-2

the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to siting a Federal consolidated interim storage facility and spent fuel management. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

107-2 DOE acknowledges your support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

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MS. LOWE: Thank you, Mr. DeMare. So, we'll go back into recess until we see a hand go up.

(Pause.)

MS. LOWE: Okay, we have a hand up. Michel Lee?

MS. LEE: Yes, I'm back. I will repeat a comment I made in the earlier session, but I will add to it with one point.

There isn't really a discussion of uncertainties in the report. And that is a very essential element that we needed to inform the public, with respect to security threats.

I'm well aware that one cannot go into detail or necessarily quantify the risks since they are, by nature, uncertain. But we would have enough evidence in the current century of surprise incidents waged by both foreign and domestic malevolent actors.

You have a full array of emerging technologies, AI being one of them, that dwells throughout the systems and many other technologies that are very likely to pose a considerable threat if they were waged by a knowledgeable actor.

108-1

108-1 The NRC would be the responsible regulatory authority for any HALEU fuel cycle facility that would possess HALEU (enrichment to HALEU enriched in uranium-235 to 10% and above, HALEU deconversion, HALEU storage, HALEU fuel fabrication). The NRC published promulgated regulations at 10 C.F.R. Part 37 in 2013 to establish security requirements for the transportation and use of Category I (strategic special nuclear material) and Category II (special nuclear material of moderate strategic significance) radioactive materials. As discussed in Sections 1.0.5 and 3.9 of the HALEU EIS, the HALEU that would be produced under the Proposed Action is considered a Category II material. Therefore, these facilities would need to meet the NRC requirements for a facility possessing this Category II material. Facilities that possess Category II quantities of special nuclear material (SNM) would need to implement additional security measures beyond those required for Category III (special nuclear material of low strategic significance). These measures could include: access controls, such as background checks; controlled access area (CAA) portals and vehicle access; escort requirements; random entry and exit searches; alarm stations; security patrols; communication and coordination with law enforcement; and a security equipment maintenance program. The NRC would undergo an additional case-by-case review for HALEU facilities to determine the need and extent of supplemental security measures beyond the requirements in the regulations necessary to ensure adequate protection of public health and safety and common defense and security. There are nuclear facilities within the United States that currently are required to meet these security requirements (and the more stringent requirements for Category I material). DOE acknowledges that the widescale deployment of HALEU fuels in U.S. reactors, which could be facilitated by the Proposed Action, does present different proliferation concerns than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. Preparation of an NPAS is not within the scope of an EIS. DOE expects that intentional destructive acts (e.g., terroristic acts) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. Please see Section 3.9, “Nonproliferation and Terrorism Concerns,” of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, “Nonproliferation and Terrorism,” of this CRD for a discussion of this topic and DOE’s response.

The cost of such risk extends way beyond what the actual use of activity to major destruction of the economy and potential initiation of the U.S. becoming involved in another war.

Here again, you've got developing threats, where they cannot be quantified and they cannot be discussed in great detail, should be identified. And I'll just add to the list. And that's absolutely necessary if you maintain your professed mission of informing the public.

Thank you, that's it.

MS. LOWE: Thank you, Ms. Lee.

So we're still here until 9:45. So if you have something you'd like to say, please raise your hand, and we'll go back live. Thank you.

MS. FIELDS: I'd like to speak, I'm on the phone.

MS. LOWE: Okay, we have someone that would like to speak. Can you please give us your name before you speak?

MS. FIELDS: Yes, it's Sarah Fields. I'm with Uranium Watch in Moab, Utah, which addresses uranium mining and milling issues.

108-1 (cont'd)

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MS. LOWE: Okay, go ahead.

MS. FIELDS: Looking at your draft Environmental Impact Statement and Section 2.1.1, the Uranium Mining and Milling, kind of an introduction, you have a map of HALEU Mining and Milling Overview.

So, you have a map of Utah, and there is Garfield County, where you have a milling facility, at least on the map.

The main milling facility is not in Garfield County, it's next door in San Juan County. They have an old uranium mill in Garfield County, which hasn't operated since 1982. So, that's wrong on the map.

Over in New Mexico, you show an ISL operation in McKinley County. There is no operating ISL uranium recovery operation in New Mexico.

Looking at Arizona, it shows conventional mining over on the northwest corner of Arizona. There is no uranium mining in -- this is Mohave County. There's no uranium mining in Mohave County.

And what you're missing is uranium mining in the northeast corner of Arizona, where

109-1

109-1 Thank you for the information regarding the mining and milling locations presented in the EIS. DOE has reviewed the information and made applicable changes to Figure 2.1-1 in the EIS. Please refer to Section 3.1, "Uranium Mining and Milling," in Vol. 1 of the Final EIS and Section 1.3, "Affected Environment and Environmental Consequences," of the Technical Report (Leidos, 2023) for a detailed discussion regarding assessment of impacts for mining and milling activities. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) so as to provide more detailed analyses of the bases for the conclusions, especially those conclusions where the impacts were judged by the SMEs and supporting NEPA analyses to be "SMALL."

uranium mining is taking place close to the south rim of the Grand Canyon in National Forest Land.

So, you have that. And you have other indications of the -- recovery operations in other states, but I don't have enough information to comment on that.

And then further down, you have some information on the environmental impacts. During your discussion, you do say that the impacts from conventional uranium mining and milling is small, so you're not really even going to look at that.

And if the only possibility that a large impact would be -- needs to know.

And you don't mention at all that that would require a license amendment, and it would destroy significant archaeological resources, including pit houses and -- The whole -- is --

MS. LOWE: Can you conclude your remarks? That's three minutes.

MS. FIELDS: Yes, yes.

MS. LOWE: Thank you.

MS. FIELDS: Thank you.

MS. LOWE: If you need to get a hold of us again, press star-nine for raising your hand.

109-1 (cont'd)

Response side of this page intentionally left blank.

If you want to provide another comment, please press use star-nine to let us know that you would like to provide a comment on your phone.

MS. FIELDS: Thank you.

MS. LOWE: We will go offline again. It's 9:18, and we're going to schedule to be here until 9:45.

(Pause.)

MS. LOWE: We have another hand raised. Michael Keegan has raised his hand. Michael, if you'd like to speak again.

MR. KEEGAN: Yes, can you hear me? Thank you. Michael Keegan with Don't Waste Michigan.

About a month ago I sat in at a meeting with DOE NRC meeting and they were discussing HALEU, and they were really giddy about the $500 million they'd gotten dispensed to do experiments.

Nearly 1,000 experiments that went on and on and on. But they didn't say what the experiments were. And all the documents are secret. And it's an asymmetrical veil to even know what you're up to, so we're left to deduce.

110-1

110-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

About 50 years ago, Harvard conducted a colloquium on security and what would a plutonium economy look like. I think there were 50 -- A third was security, a third were physicist types, nuclear engineers, a third of them were policymakers, legal.

And they concluded, if you go to have a plutonium academy, you're going to have a police state. Your civil liberties are going to be tremendously hampered because of security.

And here, we're traveling along a parallel path with the HALEU. Going to use it here, going to use it there, going to use it in Australia, submarines, micro, it's still a purpose. And its proliferation-prone by its very existence.

And that very question is getting ducked, or politely being dealt with, with firewalls that are opaque, and paper firms.

What is needed is a programmatic environmental impact statement. As I'm listing through the commenters, I can see there's a multitude of facilities that are involved, will be involved, in the HALEU.

And this is going to be the fuel of

110-1 (cont'd)

Response side of this page intentionally left blank.

the future -- new reactors going forward, and yet there has been no rulemaking.

The economics of it are bankrupt. Nuclear call coming in at four, five times across the wind and solar. And you can get the wind and solar in a year or two.

The opportunity cost by going down the avenue at HALEU is extraordinary. So, cease-and-desist, stop digging the hole, stop digging it deeper, stop your HALEU project.

MS. LOWE: Thank you, Mr. Keegan.

MR. KEEGAN: Thank you.

MS. LOWE: So, if you would like to provide comments, please put your hand up in the Zoom.

We will recess again. We have about 20 more minutes that we're available to take comments in this session.

(Pause.)

MS. LOWE: Okay, I just want to give you a fifteen-minute warning. So, we have fifteen more minutes in this session. If you want to make a comment, please raise your hand. We're here.

We have a hand. Joe DeMare again.

110-1 (cont'd)

110-2

110-3

110-2 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 1.1 of the EIS and Section 2.2, "Purpose and Need" of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please see the discussion in Sections 2.1 "Support and Opposition" and 2.8, "Out of Scope," of this CRD for additional information.

110-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

MR. DEMARE: Yes. Table 2.6-1, the draft EIS claims that for all -- activities overall, the potential for environmental consequences are small.

This conclusion was reached without any kind of supporting information, as far as I can tell.

And one of the things that the Department of Energy needs to take into account is the impact of past experiences, past fuel enrichment practices. Particularly in places like Piketon, where recently they just had to close an entire school building because of contamination from fuel enriching activities years before.

The full impact of past activities aren't known. They're still unfolding and they're getting more and more serious as time goes on, in terms of loss of property, in terms of loss of health, in terms of loss of genetic health.

And so, to simply make the assertion, with no support, the potential environmental consequences are small, is wrong.

Potential environmental consequences

111-1

111-1 Changes were made throughout the Final EIS to improve introduction, discussion, and linking to the Appendix A and the Technical Report, which should help explain how DOE substantiated the impacts conclusions reported in the Summary and Chapter 2 tables. Environmental impact methods and discussions are first presented in Chapter 3, then Appendix A, and ultimately the Technical Report. Many of the existing or ongoing NEPA evaluations, relied upon in this EIS, were or are being prepared under the NRC implementing regulations and requirements. The NRC is the regulatory authority primarily responsible for uranium fuel cycle facilities and activities, and NRC has been using and continues to use the defined impact assessment categories (SMALL, MODERATE, and LARGE) to characterize the potential environmental consequences. As discussed in Appendix A, the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors, who are Subject Matter Experts (SMEs) in their respective fields, used their education, working knowledge, experience, and professional judgement to extrapolate the potential environmental consequences associated with the Proposed Action. This also included preparation of a Technical Report (Leidos, 2023), which provides greater detail in the determination of impacts by resource area and HALEU activity. The Final EIS has been updated to include specific hot links to the appropriate sections of the 500+-page Technical Report to provide more detailed analyses of the basis for the conclusions, including consideration of present-day regulations and oversight. In general, the Proposed Action represents a smaller scale level of activity and footprint compared to the activities and footprints evaluated in the existing NEPA evaluations. The relatively smaller scale was factored into the SMEs' evaluations and reflected in the impact assessment categories identified in this EIS. Historical legacy impacts were not included in the extrapolated potential environmental consequences assessments. See Section 2.4, "Legacy Issues," of this CRD.

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-- for example, if centrifuges explode and send highly irradiated fuel, which is both chemically and radioactively toxic, out into the environment, those consequences could be huge. Cleanup could cost millions or billions of dollars. These substances remain toxic for hundreds of thousands of years.

If you're looking at the potential environmental impact, you have to think about the worst-case scenario.

As far as I can tell, all scenarios in this report, in this draft environmental statement, are best-case scenarios.

For example, when you talk about storing the fuel, you describe creating a cinder block building, and you mention maybe you should have some security around that building, but no discussion of the possibility of malicious actors that might try to attack it, requiring extensive security and fortifications -- barbed wire, moats, machine gun placements.

We are living in dangerous times that are becoming more and more dangerous. This is not the time to be using rosy best-case scenarios for your potential dangers.

111-2

111-3

111-2 As part of mining and milling, yellowcake slurry would be dewatered using a centrifuge. Centrifuges are also used to enrich uranium. Neither of the centrifuge operations in the nuclear fuel cycle involve highly irradiated fuel. Irradiated fuel results from using the fuel in a nuclear reactor. The HALEU EIS evaluates the impacts from nuclear fuel cycle facilities that would be required for HALEU fuel commercialization and the impacts from reasonably foreseeable activities related to using HALEU. Centrifuge operations are addressed in the Leidos Technical Report (Leidos, 2023) that supports the HALEU EIS. Failure of centrifuges used to dry yellowcake could release radioactive materials into the interior of the mill building. The most significant accident consequences are those associated with an inadvertent nuclear criticality and to a lesser extent the release of UF_6 in the enrichment process. Occupational risks are addressed for normal operations while radioactive and hazardous material releases are addressed for normal operations and accidents. Evaluations for occupational risks, radioactive material releases, and hazardous material releases are considered for worst-case scenarios that give consequences that would be greater than the consequences actually expected. Costs are not within the scope of the HALEU EIS.

111-3 Storage of HALEU materials and fuel would be controlled under highly-regulated conditions. The NRC would be the responsible regulatory authority for any HALEU fuel cycle facility that would possess HALEU (enrichment to HALEU enriched in uranium-235 to 10% and above, HALEU deconversion, HALEU storage, HALEU fuel fabrication). The NRC published 10 C.F.R. Part 37 in 2013 to establish security requirements for the transportation and use of Category I (strategic special nuclear material) and Category II (special nuclear material of moderate strategic significance) radioactive materials. As stated in the HALEU EIS, the HALEU that would be produced under the Proposed Action is considered a Category II material. Therefore, these facilities would need to meet the NRC requirements for a facility possessing this Category II material. Facilities that possess Category II quantities of special nuclear material (SNM) would need to implement additional security measures beyond those required for Category III (special nuclear material of low strategic significance). These measures could include: access controls, such as background checks; controlled access area (CAA) portals and vehicle access; escort requirements; random entry and exit searches; alarm stations; security patrols; communication and coordination with law enforcement; and a security equipment maintenance program. The NRC would undergo an additional case-by-case review for HALEU facilities to determine the need and extent of supplemental security measures beyond the requirements in the regulations necessary to ensure

So, this draft environmental impact statement fails spectacularly, in looking at potential dangers in the future. That's it.

MS. LOWE: Thank you, Mr. DeMare. We are here if anyone would like to provide comments. Please raise your hand.

(Pause.)

MS. LOWE: I just want to give a one-minute warning before we restart the meeting.

(Pause.)

MR. REIM: Hey guys, we're back in.

MS. LOWE: We have officially reached the end of this public hearing. On behalf of the U.S. Department of Energy, I would like to thank you for your participation in this public comment process for the HALEU Environmental Impact Statement.

I would like to emphasize that DOE will continue accepting comments via email and mail until April 22, 2024.

As a reminder, written comments should be sent to Mr. James Lovejoy, who is DOE's EIS document manager.

They can be sent to U.S. Department of Energy, Idaho Operations Office, located at 1955

111-3 (cont'd)

adequate protection of public health and safety and common defense and security. There are nuclear facilities within the United States that currently are required to meet these security requirements (and the more stringent requirements for Category I material. DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation concerns than the use of low enriched uranium. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Fremont Avenue, Mailstop 1235, in Idaho Falls, Idaho, 83415, or if you'd prefer, by email to HALEU, spelled H-A-L-E-U, hyphen EIS, at nuclear.energy.gov.

The same addresses may also be used to request to be added to the mailing list for project notifications.

For more information, including the hearing's presentation slides that we used tonight, will be available on the project website at https://www.energy.gov/NE/haleu-environmental-impact-statement.

Let the record reflect that it is now 9:46 and we will adjourn this hearing. Thank you so much for participating tonight.

(Whereupon, the above-entitled matter went off the record at 9:48 p.m.)

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C E R T I F I C A T E

This is to certify that the foregoing transcript
In the matter of: Draft EIS in Support of HALEU
Before: U.S. Department of Energy
Date: 04-03-24
Place: Herndon, Virginia
were duly recorded and accurately transcribed
under my direction; further, that said transcript
is a true and accurate record of the proceedings;
and that I am neither counsel for, related to,
nor employed by any of the parties to this action
in which this deposition was taken; and further
that I am not a relative nor an employee of any
of the parties nor counsel employed by the
parties, and I am not financially or otherwise
interested in the outcome of the action.

Court Reporter

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UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF NUCLEAR ENERGY

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DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR DEPARTMENT OF ENERGY ACTIVITIES IN SUPPORT OF COMMERCIAL PRODUCTION OF HIGH-ASSAY LOW-ENRICHED URANIUM (HALEU)

+ + + + +

PUBLIC HEARING

+ + + + +

WEDNESDAY

APRIL 3, 2024

+ + + + +

The public hearing convened at 2300 Dulles Corner Boulevard, Herndon, Virginia 20171, at 10:00 p.m., Wendy Green Lowe, Facilitator, presiding.

PRESENT

WENDY GREEN LOWE, Facilitator
MICHAEL REIM, Program Manager

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Comments from the Draft HALEU EIS Public Hearing
2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 10PM

P-R-O-C-E-E-D-I-N-G-S

10:01 p.m.

MS. LOWE: Good evening, everyone, and thank you for joining us for this virtual public hearing. My name is Wendy Lowe, and I'd like to welcome you to this public hearing on behalf of the U.S. Department of Energy's Office of Nuclear Energy.

In compliance with the National Environmental Policy Act, the Department of Energy has published a draft Environmental Impact Statement, which analyzes the impacts of DOE's proposed action to acquire High-Assay, Low-Enriched Uranium, or HALEU, for commercial use and demonstration projects, and to facilitate the domestic commercialization of HALEU production.

At the front of the room with me, I have Billy Sanders and his colleague, Catherine Willett, who are providing American Sign Language interpretation services for us tonight.

The goals of this public hearing are to explain the process used to analyze the proposed action and alternatives, and to provide you, as members of the public, with an opportunity to submit oral comments on the draft

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Environmental Impact Statement.

In the first portion of this meeting, DOE's program manager for the HALEU program will tell you about the draft EIS. During the second portion, you will be invited to provide oral comments.

Both oral and written comments submitted throughout a 45-day public comment period will be considered by the Department of Energy.

Comments received during this time will help DOE refine its analysis, identify new information, and consider additional alternatives, during development of the final Environmental Impact Statement.

Today is Wednesday, April 3, 2024, and the time is now 10:01 p.m. Eastern. This virtual public hearing is one of three that are being held this evening. The first hearing started at 6:00 p.m. Eastern, and the second at 8:00 p.m. Eastern.

Please be aware that all three hearings are being recorded, and the recordings of all three virtual meetings will be combined into one file and uploaded to the project website

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within two weeks of this hearing.

The information portion of this public hearing will begin shortly, with a presentation by Department of Energy's Program Manager, Michael Reim.

His presentation was pre-recorded to make sure the information presented is consistent for all three sessions of this meeting.

The presentation will last approximately ten minutes and will provide information about the National Environmental Policy Act, as well as background information about the proposed action.

For those calling in on an audio-only device, I would invite you to go to the project website so that you can see an uploaded version of the presentation slides. The project website is located at https://www.energy.gov/NE/haleu-environmental-impact-statement. This link will be provided in the chat for those of you who are participating online with Zoom.

Following the presentation, I'll explain the procedures we'll be using for taking comments.

MR. REIM: Hello, and welcome to this

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2300 Dulles Corner Boulevard, Herndon, Virginia April 3, 2024, 10PM

public hearing. I'm Michael Reim, Program Manager for the U.S. Department of Energy, Office of Nuclear Energy.

And today, we'll be talking about the draft Environmental Impact Statement for DOE activities in support of commercial production of High-Assay, Low-Enriched Uranium, also known as HALEU.

First, I'd like to give a presentation overview, beginning with the National Environmental Policy Act overview.

This will include the purpose of an Environmental Impact Statement or EIS, comments received during the scoping period, the purpose of public hearings in general.

Additionally, I'll be discussing the project background -- this includes the purpose and need, a proposed action and alternatives, scope of activities, approach to the impact analysis, the impact analysis categories, and the summary of potential impacts.

First, we'll begin with the National Environmental Policy Act. NEPA is a Federal law that requires federal agencies to identify and consider the environmental consequences of

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implementing projects.

An EIS is prepared for proposed actions likely to have significant effects. An EIS also analyzes the effects of a proposed action, and is prepared before actions are taken that could limit the selection of an alternative, or result in adverse environmental effects.

The EIS process incorporates public input, which is why we're here today, and informs the public and decision-making process, which is the purpose of this presentation.

Additionally, the purpose of an environmental impact statement is to identify the purpose and need for the proposed action, to identify alternatives. This includes a reasonable range of alternatives that meet the purpose and need, including the preferred alternative. This also includes a no-action alternative.

It also describes the existing environment at candidate sites, or areas to be affected by the alternatives. It evaluates the environmental consequences of the alternatives, using the best available information. It identifies mitigation measures, and it evaluates

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direct, indirect, and cumulative impacts.

The scoping period for the HALEU EIS took place from June 5, 2023, until July 20, 2023, for 109 individual comments were identified.

DOE reviewed each comment document, characterized the comments, and found the public wanted several topics to be covered in the draft Environmental Impact Statement.

This list includes: Accidents & Human Health; Alternatives; Climate Change; Conversion; Cost Analysis, Deconversion; Environmental Justice & Justice40; Enrichment; Environmental Impacts; Fuel Fabrication; NEPA in general; Non-proliferation; Nuclear Waste Management; Opposition to the Project; Out-of-Scope Comments; Purpose and Need for Reactor Technologies, Regulatory Concerns; Spent Fuel Management; Storage; Support Activities, Transportation; and Tribal Consultation.

In response to the comments received, the DOE expanded discussions about how project locations would be chosen, in the Reader's Guide, at Section 1.0 of Volume 1, and added a non-proliferation section in Section 3.9 of Volume 1.

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Other topics were either already identified in the NOI and covered in the draft EIS, or were deemed out of scope for the EIS.

Next, I'll discuss the purpose of public hearings and the goals of public hearings.

The purpose is to provide the public a forum to learn more about the Draft HALEU EIS and its proposed action, as well as to solicit public comments prior to the Final EIS.

The goals of the public hearings are three-fold: to inform the public about potential environmental impacts of the Proposed Action and Alternatives; secondly, to seek feedback from stakeholders, including Federal, state, Tribal, local agencies, NGOs, and the public, on the Draft EIS; and finally, to provide opportunities for stakeholders and other interested parties to make formal comments on the Draft EIS.

Next, I'll discuss the project background for HALEU.

One aspect of a clean energy future is the sustainment and expanded development of safe and affordable nuclear power. And one key element of that goal is the availability of fuel to power those reactors.

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HALEU is a crucial material required by most U.S. advanced reactors. Most designs require HALEU in order to achieve smaller designs, longer operating cycles, and increased efficiencies over current nuclear energy technologies.

However, there are currently limited options for acquiring HALEU.

HALEU is not currently available from domestic suppliers, and gaps in supply could delay the deployment of advanced reactors in the time frame that supports the nation's net-zero emissions targets by 2050.

Currently, commercial nuclear fuel suppliers can't produce HALEU, largely due to market uncertainties and infrastructure gaps.

This poses a concern for the development, demonstration, and deployment of many advanced nuclear technologies.

To accommodate these gaps and help meet the nation's net-zero emissions targets, the Energy Act of 2020 directs the Secretary of Energy to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic

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research, development, demonstration, and commercial use.

Further, Section 3131 of the recently enacted National Defense Authorization Act for Fiscal Year 2024, among other things, seeks to expeditiously increase domestic production of HALEU to meet the needs of advanced nuclear reactor developers and the consortium established under Section 2001(a) of the Energy Act of 2020.

The Proposed Action is to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent uranium-235, over a ten-year period of performance, and to facilitate the establishment of commercial HALEU fuel production.

Given the variety of HALEU applications, the initial capability is intended to be flexible, and to be able to accommodate a number of items: Enrichments of U-235 to greater than 5 and less than 20 weight percent; production of up to 290 metric tons of HALEU at multiple enrichment facilities; Modular HALEU fuel cycle design concepts, and to accommodate future growth; Deconversion of UF6 to forms

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suitable for production of a variety of fuels, and to include oxides and metal.

Under the no-action alternative, DOE would not acquire through procurement from commercial sources, up to 290 metric tons of HALEU, or facilitate the establishment of commercial HALEU fuel production.

The EIS addresses six activities associated with the acquisition of 290 metric tons of HALEU: extraction and recovery of uranium ore, processed to yellowcake; conversion of the yellowcake into UF6; enrichment, including enrichment to no more than five-weight percent; enrichment greater than five and less than ten-weight percent; and enrichment from ten to less than 20 percent U-235 in an NRC Category II facility.

It also includes deconversion of the UF6 to uranium oxide, metal, and potentially other forms in a Category II facility; Storage in a Category II facility; and Transportation of uranium and HALEU between facilities.

In addition to the previous activities, the EIS discusses three reasonably foreseeable activities that could result in the

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implementation of the proposed action.

This includes fuel fabrication for a variety of fuels; Reactor operation, including demonstration tests, power, and isotope production; and spent fuel storage and disposition.

While not specifically a part of the Proposed Action, the impacts from these reasonably foreseeable activities are acknowledged and addressed to the extent practicable.

One contributing factor to the significance of environmental impacts is where facilities are located.

However, locations will not be chosen as part of the record of decision for this EIS, as potential HALEU fuel cycle facilities are subject to an ongoing procurement process, including responses to requests for proposals.

To determine the potential environmental consequences with outside-specific information, DOE evaluated existing NEPA documentation for uranium fuel cycle facilities used in a low-enriched uranium fuel cycle, as well as available HALEU fuel cycle NEPA reviews.

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The activities described in the proposed action are not unique. Extensive NEPA evaluation documentation exists for environmental consequences of similar activities.

Since the proposed action is to acquire HALEU from commercial sources, those commercial sources could propose a range of location scenarios for producing HALEU.

Scenarios could include the use of existing uranium fuel cycle facilities, with modifications or extensions; it could include construction and operation of a new facility at an existing industrial site or brownfield site, and it also could include the construction and operation of a new facility at a previously undisturbed site, or greenfield site.

To estimate potential impacts associated with the proposed action, this EIS's subject matter experts leveraged the extensive existing NEPA documentation's impact assessment and determined relative impacts associated with performing these activities at existing facilities, brownfield sites, or greenfield sites, using the NRC's impact assessment categories.

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Potential modification, construction, and operation of HALEU fuel cycle facilities would be subject to U.S. Nuclear Regulatory Commission and other federal agency, or agreement state licensing, including NEPA review, and potentially other federal and state permitting.

This EIS adopts the NRC impact assessment categories from the NEPA documents that were used as the basis for the impact analysis.

Small impacts are not detectable, or are so minor that they neither destabilize, nor noticeably alter, any important attribute of the resource.

Moderate impacts are sufficient to alter noticeably, but not destabilize, important attributes of the resource.

And large impacts are clearly noticeable, and are sufficient to destabilize important attributes of the resource.

This slide summarizes the impacts of siting a HALEU facility at the three location scenarios analyzed in this EIS.

For existing uranium fuel cycle facilities, most impacts would be small. The

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greatest potential for large impact is associated with mining and milling, and impact levels are mine-specific.

For other industrial sites, or brownfield sites, impacts are generally ranged from small to moderate, with potentially large impacts in areas associated with site demographics, and historic, cultural, and ecological resources.

For previously undeveloped, or Greenfield, sites, this is similar to locating at brownfield sites, with potentially larger impacts than brownfield, due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

This concludes the end of the presentation portion of the meeting, and I'd like to thank you again for your participation in the EIS process.

MS. LOWE: Thank you, Mr. Reim. And that concludes the information portion of this virtual hearing. Next, we will begin accepting comments on the draft Environmental Impact Statement.

As moderator, it's my job to make sure

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that this hearing is conducted in a respectful manner, and to ensure that we provide a fair opportunity to provide oral comments.

Michael Reim will be listening to the comments on behalf of the Department of Energy. But please understand that he and other DOE representatives are here to listen. They will not be responding to any comments during this hearing.

A court reporter is also present off-screen to transcribe each comment during this hearing. Please try to speak clearly into your microphone to help ensure that the court reporter can accurately record your comments.

I'd like to emphasize that providing oral comments during this virtual public hearing is only one of the ways that you can participate in the EIS process. You may also submit written comments by sending them via U.S. Mail, or by email.

Written comments on the draft EIS should be sent to Mr. James Lovejoy, who is the DOE EIS document manager, mailed to the U.S. Department of Energy's Idaho Operations Office at 1955 Fremont Avenue, Mailstop 1235, in Idaho

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Falls, Idaho, 83415.

If you'd prefer, you can send them by email to HALEU, spelled H-A-L-E-U, hyphen EIS, at nuclear.energy.gov.

Those same addresses can be used to request to be added to the mailing list for the project notifications.

DOE will consider all comments received or postmarked by the end of the public comment period, which will end on April 22, 2024.

All comments will be given equal consideration, regardless of whether they're submitted orally or in writing.

The comments received throughout the comment period will be compiled and incorporated into a comment response document. The comment response document will include DOE's responses to comments that have been received, and it will be included in the final EIS.

The opportunity to provide comments on the draft EIS began with the publication of a notice of availability on March 8, 2024.

The notice of availability included information about how commenters can pre-register to provide oral comments during this session.

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As we begin the oral comment portion of this hearing, we have four people who have already registered to speak. We will begin by taking their comments first.

If you're interested in providing comments during this public hearing but didn't register ahead of time, we'll do our best to provide an opportunity for you to comment as well.

You can let us know if you're interested in commenting, by using the raised-hand function in Zoom.

Zoom keeps track of people who raise their hands in order, and we'll call on you on a first-come, first-served, basis.

Time permitting, we will allow those with raised hands to provide oral comments after hearing from the pre-registered attendees.

If you're calling in by telephone, you can also raise your hand by dialing star-nine.

To allow a fair opportunity to speak to as many people as possible, oral comments will be limited to three minutes per speaker. To help you keep track of time, a digital countdown clock will be provided on-screen.

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This session is scheduled to go to 11:45 p.m., Eastern.

If there's time remaining before we're scheduled to end, we may provide the opportunity for anyone who has already spoken, to have a second opportunity to provide comments.

I will call the names of two people at a time, to give you a bit of notice when it's almost your turn to speak.

When I call on you to provide your comments, our technical support team will unmute your microphone.

Please begin by stating your name and the name of any organization that you're representing in an official capacity tonight. Your three minutes will begin at that point.

Regardless of whether you registered to speak ahead of time, or if you've raised your hand to speak, you can change your mind about speaking.

If you change your mind about speaking, please let us know when you're unmuted, and I'll move on to the next person in the queue.

We recognize that three minutes is a brief amount of time, and we encourage you to

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provide more detailed comments in writing, to ensure that all of your thoughts, concerns, and suggestions on the draft EIS, can be fully captured in the record.

I will let you know if you run out of time. And if you're still speaking once your three minutes are up, I will ask you to conclude your remarks and I will call on the next speaker.

Please understand that if I do have to cut you off, it's to ensure that we can hear from as many people as possible, and that everyone who wants to speak during this public hearing has a fair opportunity to do so. We will accommodate as many people as we can until 11:45 p.m., Eastern Time.

One final request I make of you tonight. I know that some of you may have strong opinions about DOE's proposal. We hope everyone will share their opinions in a respectful manner.

One of the main purposes of a public hearing is to give each of you an opportunity to provide your thoughts to DOE about the draft Environmental Impact Statement.

We're grateful that you've taken time out of your busy schedules to participate in this

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virtual public hearing.

With that, we will begin taking comments. On my list of pre-registered speakers, the first person on the list for this session is Cathryn Chudy. She'll be followed by Cynthia Madansky.

MS. CHUDY: Can you hear me?

MS. LOWE: We sure can.

MS. CHUDY: Okay. I appreciate the opportunity to hear what the Department of Energy is doing with this Environmental Impact Statement and the explanation.

MS. LOWE: Cathryn, would you state your name for the record, please?

MS. CHUDY: Oh, my name is Cathryn Chudy.

MS. LOWE: Okay, thank you. I'm sorry to interrupt you. Go ahead.

MS. CHUDY: Okay. I live in Vancouver, Washington, and also am in both Oregon and Washington, very concerned about the risk and environmental damage with HALEU.

And I see that this EIS is based on the idea that the advanced reactors that are going to use this fuel are going to produce clean

112-1

112-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," and 2.8, "Out of Scope," for further information about why investing in renewable energy such as solar and wind would not fulfill the purpose and need of the Proposed Action. In regard to your comment about the Proposed Action's effect on climate change, DOE is aware of numerous studies showing the benefits of nuclear energy on reducing greenhouse gas emissions and their impacts on climate change (see https://world-nuclear.org/nuclear-essentials/how-can-nuclear-combat-climate-change#:~:text=Nuclear%20power%20plants%20produce%20no,electricity%20when%20compared%20with%20solar and https://www.iaea.org/bulletin/what-is-the-clean-energy-transition-and-how-does-nuclear-power-fit-in. See also Sections 2.6.2 and 2.7.1.3 of the EIS for discussion of the potential decreased greenhouse gas emissions associated with the Proposed Action. DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. Thank you for participating in the EIS process.

energy.

And I am a board member of the Oregon Conservancy Foundation, and we have long been involved in addressing the risks and dangers and environmental impacts of nuclear energy.

And we don't see it as a climate solution. We see available alternatives that are generally clean and don't bring the risks that this EIS is asking taxpayers to take and communities to take, not just in Oregon and Washington and along the Columbia River, where one of these advanced reactors is proposed, but also across the country.

And so, the no-action alternative, which would allow us to pursue, and the Department of Energy to pursue, generally clean and not harmful alternatives, would be our recommendation to the Department of Energy. Thank you.

MS. LOWE: Thank you, Ms. -- Choody? Chudy?

MS. CHUDY: Chudy.

MS. LOWE: Chudy. Okay, sorry to mispronounce your name.

The next person will be Cynthia

112-1 (cont'd)

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Madansky. She'll be followed by Joseph DeMare.

Okay, Joseph DeMare will be followed by Mark Fallston.

MR. DEMARE: Hello again. Joseph DeMare, Co-Chair, Wood County Green Party. I actually touched on most of the points I wanted to discuss during the earlier hearings tonight, but I want to come back to the no-action alternative.

And on page 235, Section 2.6.2, and page 236, the EIS makes the claim that while solar energy produces 41 grams per kilowatt hour of electricity, nuclear only produces twelve.

However, the National Renewable Energy Laboratory, in a lifecycle assessment harmonization study done I believe last year, harmonized 3,000 lifecycle studies and discovered that solar only produces 46 grams per kilowatt hour, while nuclear produces 99.

So, the idea that nukes produce less carbon than solar was used to refute the no-action alternative. But the actual facts, according to the National Renewable Energy Laboratory, is that nuclear produces twice the carbon that solar does.

113-1

113-1 The 2021 NREL study referenced in the comment was completed in 2021 and is available online at https://www.nrel.gov/analysis/life-cycle-assessment.html. It shows that PV solar and concentrated solar power generate median CO_2e of about 50 and 25 grams/kWh, respectively, whereas nuclear power generates a lower and not higher median CO_2e of about 15 grams/kWh. Hence, the text in Section 2.6.2 of the EIS is consistent with the findings of the 2021 NREL study.

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And that's not hard to understand given all the energy that goes into building a solar plant. And it takes over a decade for the energy put into a nuclear plant to make its way back.

There was also a discussion of the exposure expected for workers in these HALEU plants. I refer back again to the INWORK study done at the Medical Journal on 8/16/23, cancer mortality with low-dose exposure to ionizing radiation.

The risks to those workers need to be reevaluated based on the British Medical Journal's INWORK Study.

And I believe you'll find that the impact on the health of those workers at those levels, based on this latest study, will be high; that they will be very likely to experience cancer mortality at rates roughly one-and-a-half to twice the general population.

Just re-touching on the main points I made in my first presentation, one of the things that was happening here is that there's a great deal of social cost continuing to give the appearance that the federal government is working

113-1 (cont'd)

113-2

113-3

113-2 The HALEU EIS considered the exposure to workers in the analysis of occupational health impacts. For most of the NRC regulated facilities, worker doses were based on data contained in NRC annual occupational exposure reports (see Sections 3.3.11.4, 4.3.11, 5.3.11, and 7.3.11 of the Technical Report [Leidos, 2023]). While the information referenced by the commenter is noted, any conversion of dose to health effects is performed using dose conversion rates currently approved by DOE, NRC, or EPA. These conversion factors have been revised several times in the past. Should new information indicate the conversion factors should be modified, these agencies would make appropriate modifications to the approved factors.

113-3 The HALEU EIS analyzes the potential impacts of the Proposed Action of acquiring , through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production. The public's perception of the nuclear industry and the specific incidents cited in the comment are outside the scope of the HALEU EIS. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

for billionaires like Bill Gates and TerraPower, by giving them fuel to make them more profitable.

This is part of a larger pattern of corruption we see in the nuclear industry. Then House Bill Six in Ohio, and the nuclear scandals in Illinois and the other scandals, with HolTech convicted of bribery, and getting them convicted of making false statements to the government.

We should not produce any -- You're allowed to produce up to 290 tons, but you're not required to produce 290 tons. And so, that's it. Thank you.

MS. LOWE: Thank you, Mr. DeMare. Mark Fallston? Okay, Mark is our last pre-registered speaker. If anyone would like to provide additional comments, of if anybody that hasn't commented yet, please raise your hand and we'll call on you. Cathryn and Joseph, you can speak again if you would like as well.

We're scheduled to go until 11:45 p.m. and we will be available to take any comments between now and then. So, we will turn the mics off and wait until we see a hand go up. If you change your mind and want to speak, let us know.

(Pause.)

113-3 (cont'd)

113-4

113-4 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. The Proposed Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE believes that the procurement of 290 MT of HALEU would be sufficient to incentive the commercial industry, permitting the industry to undertake future HALEU activities without DOE involvement. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

MS. LOWE: We have a couple of hands up. Joseph DeMare.

MR. DEMARE: Thank you. I just want to emphasize again the experience globally, in terms of choosing the no-action alternative.

What we see over and over again is that countries which reject nuclear make the transition to carbon-free energy quicker.

I've already mentioned Uruguay, which is essentially 100 percent carbon-free now, using zero nuclear and 100 percent renewables.

They've been generating 100 percent of their power for the past seven months without any nuclear. Similarly, Portugal at 80 percent.

The same is true of South Australia, which has one of the highest penetrations of renewable energy and one of the largest grids in the world.

And of course, you have to look at the example of Germany, which closed its last three nuclear power plants last year. And since closing them, their use of greenhouse gas emissions has continued to decline.

They reopened a few coal plants for a few months. But overall, their emissions of

114-1

114-1 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

greenhouse gases have continued to go down and those plants are being closed as we speak, now that we're coming out of winter.

And the reason is that these countries all put more energy and more resources into putting up wind turbines and solar panels, and efficiency and storage. And by doing that, they are making the transition to carbon-free. And some have already made the transition to a carbon-free economy very quickly, whereas we, even by the best estimates, would take at least another decade if we tried to keep going down the nuclear path, the radioactive path.

So, again, once again, the no-action alternative is the best in terms of limiting greenhouse gases. Thank you.

MS. LOWE: Thank you, Mr. DeMare. Jean Nichols?

MS. NICHOLS: Yes, my name is Jean Nichols and I'm from New Mexico. And I haven't had a chance to really review the EIS, so I will be sending in written comments. But I just wanted to, well, for one thing, to echo what Joseph said. I agree with that he says.

And to say that I'm concerned with

114-1 (cont'd)

115-1

115-1 The uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no wastes with unique characteristics. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See Section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

where the waste is going. We in New Mexico have taken the brunt of a lot of the nuclear waste from the weapons, and also a lot of the uranium mining. And it seems to me that it's a question of environmental racism for Native American tribes, and I would be in favor of, I guess, the no-action. I haven't really looked at it closely, but I will send in written comments.

But I agree with the other, that it's a bad move to move totally to nuclear, and that we should be looking at renewables. Thank you.

MS. LOWE: Thank you, Ms. Nichols. The comment period ends on April 22nd.

MS. NICHOLS: Great.

MS. LOWE: Thank you. Okay, I see no hands presently. So, we are still here. If you want to make a comment, please raise your hand and we'll call on you to speak.

(Pause.)

MS. LOWE: Okay, I just wanted to go on the record. It's 10:45 -- 10:46 actually. So, we've got another hour that we'll be available. If you want to make a comment, please raise your hand right here. He's kind of hiding back here. So, we're here though. Thanks.

115-1 (cont'd)

115-2

115-2 DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. Thank you for participating in the EIS process. The Proposed Action does not propose to move entirely to nuclear energy. Please see the discussions in Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.8, "Out of Scope," of this CRD for additional information on the Proposed Action.

(Pause.)
MS. LOWE: Okay, I'm just going online to let you know that it's eleven o'clock. We have 45 more minutes. We are still here, so if you want to provide any comments, raise your hand and let us know, and we'll go back on record. Thanks.
(Pause.)
MS. LOWE: Okay, we have a raised hand, so sorry. We have a raised hand, Cathryn Chudy.
MS. CHUDY: So, again for the record, my name is Cathryn Chudy and I'm on the board of the Oregon Conservancy Foundation.
I would like to call attention to the purpose and need statement, that one aspect of the clean energy future is the sustainment and expanded development of safe and affordable nuclear power. One key element of that goal is the availability of fuel to power advanced reactors.
Advanced reactors, none of the companies pursuing designs have demonstrated that commercial or technical viability, and yet pro-nuclear industry advocates are convincing

116-1

116-1 Please see response to Comment 056-9 related to the development of the purpose and need statement. Please also see Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of this CRD for additional information about the purpose and need. Sections S.8.1.7, 2.1.7.2, 3.7.2, and A.7.2 of the EIS along with Section 8 of the Leidos Technical Report (Leidos, 2023) address the reasonably foreseeable activity of advanced nuclear reactor operation with HALEU to the extent practicable. Specific reactor accidents and consequences for advanced reactor designs are out of scope for this EIS. However, the safety of proposed advanced reactors are expected to be addressed during the licensing of an advanced nuclear reactor. The licensing process for advanced reactors, that would be undertaken in the future by the cognizant regulatory authority would be expected to consider a comprehensive set of accident sequences and the likelihood and consequences of these accidents. The analyses for these accidents may consider that the Experimental Breeder Reactor (EBR)-II and the Fast Flux Test Facility (FFTF) demonstrated safe operation with sodium as the coolant. The advanced nuclear reactors would be designed to prevent or mitigate the consequences of accidents considered by the reactor designer, including features that make the reactors passively safe and preclude the occurrence of a meltdown mentioned by the commenter.

legislatures across the country, including in Washington, that these designs are walkaway safe and meltdown-proof, when there's no evidence to support those claims.

Omitted are the ever-lengthening timelines and increasing costs that prevent alternatives -- safe and affordable alternatives -- from being fully funded.

The billions that our Department of Energy is proposing to spend on this fuel for speculative reactors that will not come online in time to be an effective climate solution in the time frame we are facing, is unjustified.

The restarting and expanding uranium extraction, there's no way that undertaking commercial HALEU fuel production will ever be affordable, safe, or based on climate justice.

Adding to the burden of those who are impacted by existing uranium mining locations, or creating new ones to add to that burden, is not consistent with climate justice principles that are actioned, not empty words.

Real climate justice would involve spending the billions that it proposed here, to instead clean up and compensate those who have

116-1 (cont'd)

116-2

116-3

116-4

116-2 DOE acknowledges your concern regarding the cost of the HALEU proposal and the speed of reactors coming online. In regard to your comment about the speed of deployment and effect on climate change, DOE is aware of numerous studies showing the benefits of nuclear energy on reducing greenhouse gas emissions and their impacts on climate change (see https://world-nuclear.org/nuclear-essentials/how-can-nuclear-combat-climate-change#:~:text=Nuclear%20power%20plants%20produce%20no,electricity%20when%20compared%20with%20solar and https://www.iaea.org/bulletin/what-is-the-clean-energy-transition-and-how-does-nuclear-power-fit-in. See also Sections 2.6.2 and 2.7.1.3 of the EIS for discussion of the potential decreased greenhouse gas emissions associated with the Proposed Action. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. Regarding funding, DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

116-3 In general, the Proposed Action represents a smaller scale level of activity and footprint compared to the activities and footprints evaluated in the existing NEPA evaluations. For example, the requirements for HALEU commercialization would be about 20 percent of the conversion capacity of the Metropolis facility. In addition, HALEU enrichment would require 1.1 million separative work units (SWUs) per year, which is 37 percent of the capacity of Urenco USA of 3 million SWUs. The relatively smaller scale was factored into the SMEs' evaluations and reflected in the impact assessment categories identified in this EIS. Similarly, expansion of ISR or conventional mining operations in existing permitted locations already contain existing infrastructure and similar activities/impacts compared to the activities and footprints evaluated in the existing NEPA evaluations (often evaluating an entirely new facility). Please see Section 3.1 of the EIS for additional information on the potential impacts of mining and milling, the response to Comment 056-7 and the "Analytical Approach" section of the Readers Guide of, as well as Section 2.4, "Legacy Issues," of this CRD for additional information on historical legacy impacts.

been impacted, and not add anything more to that burden for anyone.

And so, for those reasons, it's not safe, it's not affordable, and it's not climate justice.

I would like to again reinforce the no-action as the outcome of this process. Thank you.

MS. LOWE: Thank you, Ms. Chudy.

We will recess again, but again, we're here until 11:45. So, if anyone would like to make comments, raise your hand. Thank you.

(Pause.)

MS. LOWE: This is a final time check. It's 11:30, we've got fifteen more minutes in this session.

So, if you haven't spoken yet and you would like to, or you'd like to speak again, please raise your hand, let us know.

We're here for fifteen more minutes. Thanks.

(Pause.)

MS. LOWE: Okay, we're going to give out one more five-minute warning. So, we'll be finishing up at 11:45. It's now 11:40. Last

116-4 (cont'd)

116-5

116-4 In this EIS, DOE has acknowledged that past uranium fuel cycle activities have resulted in long lasting, legacy issues. Mining and milling operations have in particular resulted in mill tailing piles, which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. Unrelated to the Proposed Action but related to various concerns about legacy issues, DOE's Office of Legacy Management (https://www.energy.gov/lm/office-legacy-management) was established to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the environment. In addressing this mission the Office of Legacy Management functions to protect human health and the environment through effective and efficient long-term surveillance and maintenance; preserve, protect and make accessible legacy records and information; support an effective and efficient workforce structured to accomplish departmental missions; implement departmental policy concerning continuity of worker pension and medical benefits; manage legacy land and assets, emphasizing safety, reuse, and disposition; mitigate community impacts resulting from the cleanup of legacy waste and changing departmental missions. Actively act as liaison and coordinate all policy issues with appropriate departmental organizations. The efforts associated with the Proposed Action are independent of the efforts to address legacy issues. Any action DOE takes to implement the Proposed Action would not impact the efforts DOE or other regulatory bodies are taking to address legacy issues associated with defense and commercial uranium production. Please also reference Section 2.4, "Legacy Issues," of this CRD for more information.

Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. The Purpose and Need (Section 1.1 of the HALEU EIS) cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050.

It is true that typical commercial reactors that operate on LEU are expensive. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed at less cost. Congress has directed DOE to establish and carry out a program to support the

call for comments. Raise your hand if you're interested.

(Pause.)

MS. LOWE: Okay, we have officially reached the end of this public hearing. On behalf of the U.S. Department of Energy, I would like to thank you for your participation in the public comment process for the HALEU Environmental Impact Statement.

I'd like to emphasize that DOE will continue accepting comments via email and mail, until April 22, 2024.

As a reminder, written comments should be sent to Mr. James Lovejoy, DOE's EIS document manager, by mail to the U.S. Department of Energy, Idaho Operations Office, 1955 Fremont Avenue, Mailstop 1235, Idaho Falls, Idaho, 83415.

You can also send them via email to HALEU, spelled H-A-L-E-U, hyphen EIS, at nuclear.energy.gov.

Those same addresses may also be used to request to be added to the mailing list for project notifications.

More information, including this hearing's presentation slides, will be available

availability of HALEU and has appropriated money specifically for HALEU. Support and funding for nuclear energy versus renewable energy technologies is outside the scope of this EIS.

116-5 DOE acknowledges your support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

on the project website, which is located at https://www.energy.gov/NE/haleu-environmental-impact-statement.

Let the record show that it is now 11:46 p.m. and we will adjourn this hearing. Thank you so much for participating tonight.

(Whereupon, the above-entitled matter went off the record at 11:46 p.m.)

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C E R T I F I C A T E

This is to certify that the foregoing transcript
In the matter of: Draft EIS in Support of HALEU
Before: U.S. Department of Energy
Date: 04-03-24
Place: Herndon, Virginia
were duly recorded and accurately transcribed
under my direction; further, that said transcript
is a true and accurate record of the proceedings;
and that I am neither counsel for, related to,
nor employed by any of the parties to this action
in which this deposition was taken; and further
that I am not a relative nor an employee of any
of the parties nor counsel employed by the
parties, and I am not financially or otherwise
interested in the outcome of the action.

Court Reporter

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Comments from the Draft HALEU EIS Virtual Tribal Listening Session 1

Westfields Marriott Washington Dulles Hotel, 14750 Conference Center Drive, Madison Room, Chantilly, VA, April 10, 2024, 6PM

Tribal Listening Session for the Draft
Environmental Impact Statement for
Department of Energy Activities in Support
Of Commercial Production of High-Assay
Low-Enriched Uranium (HALEU)

Moderated by Wendy Green Lowe
Wednesday, April 10, 2024
6:00 p.m.

Westfields Marriott Washington Dulles Hotel
14750 Conference Center Drive, Madison Room
Chantilly, VA 20151

Reported by: Allison Diercks
JOB NO.: 6489796

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A P P E A R A N C E S

List of Attendees:

Wendy Lowe, P-2 Solutions, Tribal Listening Session Facilitator

Michael Reim, Program Manager, U.S. Department of Energy, Office of Nuclear Energy, Office of Advanced Fuels Technologies

Dr. Jon Carmack, U.S. Department of Energy, Deputy Assistant Secretary for Nuclear Fuel Cycle and Supply Chain

Jason Anderson, U.S. Department of Energy, National Environmental Policy Act Compliance Office

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P R O C E E D I N G S

MS. LOWE: Good evening, everyone; and thank you for joining us for this virtual Tribal listening session. My name is Wendy Lowe, and I will be facilitating this evening's session. I'd like to welcome you to this listening session on behalf of the U.S. Department of Energy's Office of Nuclear Energy.

In compliance with the National Environmental Policy Act, the Department of Energy, which is also referred to as DOE, has published a draft environmental impact statement which analyzes the impacts of DOE's proposed action to acquire high-assay low-enriched uranium, or HALEU, for commercial use in demonstration projects and to facilitate the domestic commercialization of HALEU production. Along with the representatives from DOE who are here with me this evening, we want to welcome you and to express our gratitude to you for participating in this listening session. We appreciate your taking the time to be with us here and for providing your thoughts. We also want to thank those who have already provided us with valuable feedback.

In the first portion of this listening session, DOE's program manager for the high-assay low-enriched uranium program will give a short

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presentation on the draft environmental impact statement. During the second portion, you will have an opportunity to ask questions about the HALEU program and the environmental impact statement. In the third portion, you will be invited to submit formal comments on the draft EIS. All comments -- including those that are submitted during this listening session, comments submitted at other sessions, and any submitted in writing before April 22, 2024 -- will be considered by the Department of Energy. All comments received will help DOE refine its analysis, identify new information, and consider additional alternatives during development of the final environmental impact statement.

Before we begin the information portion of today's listening session, I would like to emphasize that this meeting is closed to the press and the public. If anyone has joined this meeting who is not associated with a Tribe or federal agency, I would respectfully ask that you leave this Zoom meeting. Public resources about the program are available to you on the project website, which is posted in the chat for your convenience. Thank you for your understanding and cooperation.

Today is Wednesday, April 10, 2024; and

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the time is now 6:02 p.m. Eastern. This virtual Tribal listening session is one of two that are being held this week. The second virtual Tribal listening session will be held tomorrow, Thursday, April 11, starting at nine o'clock p.m. Eastern. Please be aware that the virtual listening sessions are being recorded. You are welcome to turn your cameras on or off throughout the listening session; but we want you to be aware that your image will be included in the recording if your camera is on. Please keep your microphones muted until it is your turn to speak. The recordings for both virtual listening sessions will be combined into one file and uploaded on the project website within one week of this meeting. There will also be an in-person Tribal listening session next week on Tuesday, April 16, starting at 5:30 p.m. Mountain in Chandler, Arizona. For information on upcoming listening sessions, please visit the project website.

The presentation portion of this listening session will begin in just a moment with a presentation by the Department of Energy's program manager, Michael Reim. The presentation will last approximately 10 or 11 minutes and will provide information about the high-assay low-enriched uranium

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Comments from the Draft HALEU EIS Virtual Tribal Listening Session 1

Westfields Marriott Washington Dulles Hotel, 14750 Conference Center Drive, Madison Room, Chantilly, VA, April 10, 2024, 6PM

project and the draft environmental impact statement. For those calling in on an audio-only device, I would invite you to go to the project website so that you can see an uploaded version of the presentation slides. The project website is located at https://www.energy.gov/ne/haleu -- or H-A-L-E-U -- -environmental-impact-statement. This link will be provided in the chat for those of you who are participating online with Zoom.

Following the presentation, I will explain the procedures for the question-and-answer portion of this listening session. I ask that you please hold your questions until that portion of the meeting.

One final reminder before we begin: While we understand these listening sessions are not the same as formal government-to-government consultation, the U.S. Department of Energy also welcomes government-to-government consultation requests on the high-assay low-enriched uranium environmental impact statement. The mechanisms for submitting a government-to-government consultation request will be provided towards the end of this meeting.

With that, I'll call on Michael Reim,

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who is the program manager for the high-assay low-enriched uranium program to begin his presentation.

MR. REIM: Thank you, Wendy.

So I'm Mike Reim. I'm a program manager for the U.S. Department of Energy Office of Nuclear Energy, Office of Advanced Fuels Technologies. And this is the Tribal listening session for the draft environmental impact statement for the Department of Energy activities in support of commercial production of high-assay low-enriched uranium, or HALEU. Before I begin, I would just like to reiterate DOE's appreciation for those of you who chose to attend this evening and this week's meetings. And your feedback is very valuable to us as we go forward with developing the EIS and the record of decision. We'll have a Q & A following the presentation, so feel free to ask us clarifying questions or follow-up questions after the presentation is complete.

The other participants in addition to myself are Jason Anderson, who is a NEPA compliance officer for this project, and Dr. Jon Carmack, who is the deputy assistant secretary for nuclear fuel cycle and supply chain. And they will also be part of the QA in a moment.

So first, I'd like to begin with a

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presentation overview. There are two main parts of the presentation: first, a more general high-level discussion about HALEU and the request for proposals related to HALEU. And the second part of the presentation is more focused specifically on the EIS as part of the National Environmental Policy Act. And this will include the proposed action and alternatives, activities covered in the HALEU EIS, the approach to analysis, and a summary of potential impacts based on that analysis. So, again, this is what is referenced in the draft EIS that is currently open for public comment.

So, first off, what is HALEU? So, by definition, HALEU is uranium enriched to between 5 weight percent and less than 20 weight percent U-235. The existing U.S. nuclear reactor fleet, or the commercial reactors that generate power, generally use uranium enriched to about 5 percent; whereas advanced reactors that the Department is pursuing use uranium enriched to much higher percentages, up to less than 20 percent U-235.

In the United States, HALEU is currently limited in quantity; and we are restricted to downblending highly enriched uranium stocks down to HALEU levels in order to obtain HALEU. But we are

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seeking to develop a commercial capability to enrich uranium and create HALEU. This allows for a number of important technical attributes for these types of reactors, including smaller designs, larger -- longer life cycles, increased fuel efficiency, and less waste, in addition to some other attributes.

So this slide shows a couple of examples of advanced reactors that use HALEU. One is a Natrium design; and the second is the XE-100. Both of these are demonstration reactors that the Department is pursuing and, as mentioned, utilize HALEU fuel. Most advanced reactor designs require HALEU, not just these two designs. And, again, this achieves a number of technical attributes, including smaller designs, longer life cycles, and increased efficiencies over current technologies. So there are a lot of benefits to using HALEU.

However, as I mentioned, there are limited quantities available domestically and no commercial U.S. supply of HALEU. And gaps in producing HALEU could delay the deployment of advanced reactors in a time frame that supports the nation's goals for net-zero emission targets by 2050.

So, finally, commercial nuclear fuel suppliers can't produce HALEU, largely due to market

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uncertainties and infrastructure gaps. And this poses a general concern for the development, demonstration, and deployment of advanced nuclear technologies.

So to accommodate these gaps and to help meet this net-zero emissions target, Congress directed the Secretary of Energy under the Energy Act of 2020 to establish and carry out through NE -- through the Office of Nuclear Energy -- a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use. Further, the recently enacted National Defense Authorization Act seeks to expeditiously increase domestic production of HALEU in order to meet the needs of advanced reactor developers and the Consortium, which was established under the Energy Act.

So now I'll move into the more -- or, I'm sorry. First, I'll -- finally, I will discuss the request for proposals related to HALEU. Pursuant to the authorities mentioned on the previous slide, NE initiated a procurement process for both enrichment and deconversion. And those RFPs were issued late last year and early this year. And currently, the Department is in the process of evaluating the responses to those RFPs. We included links on the

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slide if you want to explore those further.

And maybe now is a good time as well just to mention as a general note, the Department has placed a number of resources on our website related to HALEU, advanced reactors, some of the other projects that support the development of an advanced fuel cycle. So would just like to point you to some of those resources if you're curious about that as well.

But back to the RFPs. If contracts are awarded under these RFPs cited on this slide, the awardee will be required to apply and obtain licenses and permits from the appropriate regulatory authorities: for example, the NRC, other federal agencies, agreement states. And these regulatory agencies will be required to comply with all applicable NEPA requirements or state equivalents. And at that time, DOE expects that site-specific environmental analysis will be conducted by the relevant regulatory agencies.

Okay. Now we're at the second half of the presentation. So in this half of the presentation, it is more focused specifically on the environmental impact statement and the draft EIS that is out for public comment. As mentioned, leading up to this, those were more higher level HALEU

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discussions as well as getting into discussing the RFPs that are being reviewed. So for the rest of this presentation, it's very focused on the draft EIS itself. And we welcome comments on either topic, broadly speaking.

So the proposed action in the EIS is to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent uranium-235 over a ten-year period of performance, and to facilitate the establishment of commercial HALEU fuel production. Given the variety of HALEU applications, the initial capability really is intended to be flexible because there's so many potential options. And it should be able to accommodate enrichments greater than 5 percent and less than 20 weight percent, production of up to 290 metric tons of HALEU at multiple enrichment facilities, modular fuel cycle design concepts that could accommodate future growth -- so you might install some capacity now and additional capacity later. Or when the market develops, in theory, you could install more capacity. And that might happen sometime in the future. And finally, deconversion of uranium hexafluoride to forms that are suitable for production of a variety of uranium fuels. So each

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reactor has its own specific fuel type. And, you know, for example, we would have to accommodate all those fuel types. And that could include oxides or metal, for example.

The no action alternative is the status quo. And that is where DOE would not implement the proposed action stated above.

So specifically, what activities are we referring to in the EIS associated with the proposed action? There are six specific activities. In addition, there are what we believe are three reasonably foreseeable activities covered. So I'll go through the HALEU supply chain chart one by one and briefly discuss these.

The first box on the top left is uranium production of uranium ore and processing the ore to yellowcake. So this is, essentially, you know, mining. The second step is conversion of that yellowcake into uranium hexafluoride. The third step is enriching that uranium hexafluoride gas in up to three steps at multiple locations. And this is where some options come into play. Enrichment could occur up to no more than 5 weight percent U-235, greater than 5 and less than 10 weight percent U-235, and from greater than 10 and less than 20 weight percent U-235

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in an NRC Category II facility.

The next box is deconversion of the uranium hexafluoride to uranium oxide and metal, as I mentioned previously, and potentially other forms, again, in an NRC Category II facility. If the material is not going to be used for fuel fabrication immediately, there could be storage involved following deconversion. And, as you've probably noticed all the blue arrows, there's quite a bit of transportation, as each step requires transportation as you move along the fuel cycle from step to step.

The Department also -- sorry; rather the EIS also discusses three reasonably foreseeable activities that could result from this proposed action. And that includes fuel fabrication, reactor operation, and waste storage and disposal.

So next, I will discuss the approach to impact analysis. And clearly, one factor, you know, with the significance of -- one factor contributing to the significance of an environmental impact assessment is where the facilities are actually located. However, due to the RFP process I mentioned previously, locations will not be chosen as part of this record of decision for this EIS as potential fuel cycle facilities are still being evaluated by the

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Department. However, to determine the potential consequences without that site-specific information, we evaluated existing NEPA documentation for uranium fuel cycle facilities. So these are used in the low-enriched uranium fuel cycle -- so, in other words, the fuel cycle that supports the current nuclear reactor fleet to generate electricity. And these facilities and activities are generally not unique. The same types of facilities that support the current fuel cycle would also support a HALEU fuel cycle. But there are some differences, and that's why we evaluated these.

Since the proposed action is to acquire HALEU from commercial sources, those commercial sources could propose a range of location scenarios for producing HALEU. I sort of alluded to this in the previous chart. But those scenarios could include the use of existing fuel cycle facilities. This could also include the construction and operation of a new facility or expanded facility at an existing operational site or brownfield site -- rather, an existing industrial site or brownfield site. Or finally, there could be brand-new construction at previously undeveloped or greenfield sites.

Finally, I'll discuss the summary of

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potential impacts based on these types of sites. But first, some definitions I'd like to read. This EIS adopts the NRC impact assessment categories from the NEPA documents that were used as the basis for the analysis. And there are small, moderate, and large impacts. And I will read the definitions for you. Small impacts are defined as having environmental effects that are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. Moderate impacts are defined as having environmental effects that are sufficient to alter noticeably but not destabilize important attributes of the resource. And finally, large impacts are defined as having environmental effects that are clearly noticeable and are sufficient to destabilize important attributes of the resource.

So for this EIS, we'll start with existing fuel cycle facilities. We believe that -- based on analysis, we believe that most impacts at existing fuel cycle facilities would be small. However, the greatest potential for a large impact is associated with mining and milling. However, impact levels would be mine-specific.

In addition, on to the next category. So for other industrial sites, through analysis we

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determined impacts generally would range from small to moderate. There could be potentially large impacts in areas associated with demographics and historic and cultural resources in this area.

And finally, for previously undeveloped or greenfield sites, we analyzed the impacts would generally range from small to moderate as well. Impacts at previously undeveloped sites are similar to those at brownfield sites, is what was determined via analysis.

So that concludes the presentation. And thank you very much for your attention. And, again, I just wanted to emphasize that if you have additional questions, there is quite a bit of information on the website. But also, the reason we're here, in part, is to answer your questions and to have a conversation about these topics and to listen to your thoughts and concerns about the EIS or HALEU in general. So thank you very much, and we'll move on to the next section of the meeting.

MS. LOWE: Thank you, Mr. Reim. That concludes the information portion of this virtual listening session. And we'll now move into the question-and-answer portion of this listening session, inviting your questions about the high-assay low-

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enriched uranium program and the draft environmental impact statement.

Before we begin, I'd like to note the questions and answers will not be formally included in the draft environmental impact statement. If you have a question that you would like to be formally included in the final EIS, I'd ask that you please rephrase it as a comment during the formal comments portion of this listening session, which will happen directly after the question-and-answer part. Additionally, I'd like to point out that the right-hand portion of this slide provides pathways to request the government-to-government consultation. If you're interested, you're welcome to record these addresses during the question-and-answer part of this session. If you're unable to or forget these addresses, they will be provided in the chat later in the evening.

As previously mentioned in tonight's presentation, Michael Reim, Jon Carmack, and Jason Anderson will be answering your questions on behalf of the Office of Nuclear Energy. As the facilitator, it's my responsibility to make sure anyone who's interested has the opportunity to ask questions. If you're interested in asking questions, please let us know by using the "raise hand" function in Zoom. If

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you see -- at the bottom of your Zoom screen, if you don't see "raise hand," click on the "more" and that'll pop up and you can see how to raise your hand. Zoom keeps track of people who raise their hands in order, and we'll call on you in the same order that you raised your hand. If you're calling in by telephone, you may also raise your hand by dialing star 9. Another option for asking questions will be to add them to Zoom using the chat function. We're going to take the spoken questions first, and then we'll take any questions that are posted in the chat.

With respect to the participants in this listening session, we'd like to suggest that we hear from any Tribal leaders first and then staff. When you're called on, please introduce yourself and your Tribal affiliation as you begin. We're not going to limit the amount of time that anyone has to speak, but we'd invite you to be considerate of others who may have a similar desire to ask questions. The question-and-answer portion of this listening session will continue until there are no more raised hands or questions in the chat. At that time, I will give a five-minute warning to request any final questions. If there are no questions at that time, we'll move forward into the formal comment portion of this

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session.

The question-and-answer session will now begin -- or portion will now begin. We look forward to doing our best to answer any questions you might have and hear your concerns. As a reminder, please begin by stating your name and Tribal affiliation.

So I do not see any hands raised yet. There are questions in the chat.

Leona, would you like to speak your questions out loud?

MS. MORGAN: Sure. Can you hear me?

MS. LOWE: We can.

MS. MORGAN: (Speaking Navajo) I am a member of the Navajo Nation. And my questions are mostly around -- well, I have more questions. The ones in the chat, I'll -- I'll start with those, and then -- and then I have a list of other questions.

MS. LOWE: Thank you.

MS. MORGAN: The first one is, this -- this process -- I -- I'm not sure if it's meant to be, like, a generic EIS for HALEU, but I'm just -- the first question is if each new facility would also be required to go through an individual NEPA process. And then I was just asking for all the links to be in

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the chat. And then I was wondering if Urenco, the facility in New Mexico, is -- is that slated to be used to produce HALEU?

MS. LOWE: Let's go one at a time.

MS. MORGAN: Okay. Yeah. And I have some more questions. Thank you.

MS. LOWE: The first one is, will each facility have to go through a NEPA process?

MR. ANDERSON: Thank you for that question. It was intentional that we performed a generic EIS for the HALEU EIS because we do not have site-specific information to analyze, as we do not know where the individual fuel cycle facilities will be located at this time. We do expect, though, once the particular sites for those facilities are identified, that the agencies or regulatory agencies that are in charge of licensing those facilities will perform an environmental review. And in many cases, that is a NEPA review. So we understand that our EIS does not have a lot of site-specific information with that respect, but we do expect agencies down the road to perform their local environmental reviews.

MS. LOWE: So your second question related to the relevant links. And I believe they are all in the chat. Then, your third question, do you --

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MS. MORGAN: Oh, yeah. Regarding Urenco's enrichment facility in New Mexico, is that -- because that's the only enrichment facility in North America, is that looking to start doing HALEU? I -- I don't know if that's -- that's one question. And if not Urenco, how many -- you're saying you don't know any site-specific locations, but I think you all probably have an idea what -- what is being proposed. So my question is if -- if Urenco is planning to produce HALEU, or how many facilities besides Urenco are -- are getting ready to do this in North America?

DR. CARMACK: Hi, Leona. This is Jon. Thank you for that question. We have two RFPs that are currently open and out for bid. They're now closed for proposal submittals, but they're in an official procurement process and we can't divulge details from the procurement process. But it is possible that any of the existing facilities around the nation today could be proposed by commercial industry to be utilized for production of HALEU.

MS. MORGAN: What does that mean, "any existing facilities"? Does that mean -- what type of facilities?

DR. CARMACK: The two RFPs that are currently out for proposals, one is related to

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deconversion processes; and the other one is specifically related to enrichment processes. And so we would expect that the bulk of the activities would be focused on enrichment and deconversion processes and facilities.

MR. REIM: This is a minor addition, but I'd also like to -- so I am not part of the procurement process directly. But I can tell you that, in general, companies that are interested in HALEU or even interested in the LEU market tend to put out lots of press releases at different times. So that could be a good resource to research. But, you know, like Jon said, because this is in procurement, we can't specify companies. But I would say that, you know, quite a few of them put out press releases that explain what their goals are.

MS. MORGAN: Okay. I have one more question, if it's okay. I don't want to take time away from the public comments. I have a lot of questions, but just for the sake of time.

Regarding uranium mining and milling, I'm curious if you can elaborate on the process between new uranium mining, either ISL or conventional mining. What are the steps? How would we know if that new mining was intended for HALEU? And -- and

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can you just go through the steps if it's different than conventional -- where you go from yellowcake, you know; and then you start with fuel fabrication -- are there extra steps, or is it -- can you explain that? And then -- and then, going back to my other question, how do we know if -- if uranium that's being mined, let's say, at the Grand Canyon right now, would that be slated for -- how would we know if that would be slated for HALEU production? Thanks. So that's actually two questions.

DR. CARMACK: Yeah. I think I got both questions. Thanks, Leona. Let's see. First, we understand and empathize with many of the Tribal concerns about mine locations and new mining. And it is not the intent of DOE to incentivize new mining and exploration activities in the United States.

With regard to how would we know, as part of the RFP process, we have required the bidders to identify all of the supply chain that they would be utilizing for the purposes of producing HALEU. In many respects, the supply chain for HALEU is very, very similar, if not identical, to the supply chain for low-enriched uranium that we utilize today in our current reactors. And so, up until the point of enrichment, it is practically identical. And so we

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expect to identify the supply chain from the bidders' bids themselves.

MR. REIM: And, again, I might add, like, a small detail. So, again, this is a generic response. It's not related to the procurement specifically. But, you know, there are certainly uranium producers who have existing uranium on hand. It is a commodity. So whether or not it's newly produced, what mine it came from, whether it was produced 30 years or they plan to produce in the future, you know, I think some of those details will be reflected on the procurement. But I would say that there are quite a few different scenarios for the uranium. And not all of them include, you know, newly mined material, let alone newly mined material specifically for HALEU. So it's a good question. It's a tricky question to ask -- or to answer, though.

MS. MORGAN: Just a quick follow-up in regards to what you just said. Seeing how we've used old weapons or just weapons in general to -- to get uranium for energy, can weapons be used also for HALEU?

DR. CARMACK: That's a very good question. And thanks for that, Leona. Yes. We have been taking a significant fraction of the excess

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weapons uranium material and downblending it to the HALEU enrichment level for the intent to make it available in the early years as needed by the commercial industry that these advanced reactors would be using. That's a very bad answer. Let me just rephrase that.

The advanced reactors that are under development need this HALEU material. And it can be produced from excess weapons material. And we have been taking some of the excess weapons material, downblending it to the HALEU enrichment level. And then we plan to make it available to these advanced reactor companies for the purpose of developing their technologies further for research and development and demonstration purposes. So it does form some fraction of the material that's available to these companies, but it's not enough to get the advanced reactor demonstrations the fuel that they need for their reactors. So the purpose of the HALEU availability program is to establish commercial supply of this material such that it establishes a market for the long term, depending on how these advanced reactors get developed and deployed and how extensive they are. So we'd expect to incentivize the commercial production of this HALEU material. And then, if the

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market fully realizes demand, it would expand to fill that demand.

MR. REIM: Yeah. And I have a couple other small follow-ons, if you don't mind, Jon.

DR. CARMACK: Go ahead.

MR. REIM: So, like Jon mentioned, you know, the important word for this EIS is "commercial," so commercial enrichment levels. Whereas, you know, the smaller amounts of HALEU that are produced from downblending, those are really just a temporary measure until we can establish a commercial HALEU fuel supply; because not only are the quantities small, but it's also very expensive per metric ton.

One example -- and, again, some more context since you were curious about this topic -- one example of a project is at Savannah River National Lab. So they do have monthly meetings with local groups and local stakeholders where they've briefed the public on this. But one project is to downblend HEU at Savannah River, and that would ultimately be used as HALEU fuel.

MS. MORGAN: Thank you. Thank you so much for all the answers. That's it for me for now. Thank you.

MS. LOWE: Thank you, Leona.

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There's a question from Laura Watchempino about the presentation being e-mailed to everyone on this webinar. But it is available already on the website, and the link for that is in the chat.

So, again, if you're interested in asking a question, you have two options. One is to raise your hand and the other is to post it in the chat. Maybe about five minutes to make sure we've answered all the questions you might want to ask before we move into the -- oh, there's another one. Oh, good. Let me find it. Oh, there.

Laura Watchempino? I hope I did something right there. You're welcome to unmute yourself and ask your question.

MS. WATCHEMPINO: Yes. That's correct. My name is Laura Watchempino, and we are located near the Grants Uranium Mining District, a well-known supply for uranium during the Cold War. So there are many concerns with another round of uranium mining at places that -- this might actually be a comment later, too -- at places that were previously mined and where uranium was previously milled because we still have a lot of legacy contamination existing there. And it's really a mess.

But my question concerns the sodium-

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cooled advanced reactor and the gas-cooled. Are there a lot of issues with sodium-cooled nuclear reactors?

DR. CARMACK: I'll take that one if you want.

MR. ANDERSON: Yeah. If you don't mind, Jon.

DR. CARMACK: Thank you for that question. You'll be interested to know that both sodium-cooled fast reactors and gas-cooled thermal reactors have been built and operated both in the United States and around the world over history. In terms of sodium-cooled fast reactors, there are just a few operating today. And they're all in either Russia or China. They provide the ability to have enhanced performance, both from a safety and an economics point of view. And so the point of these demonstration reactors that were in Mike's presentation is to really sort of demonstrate those capabilities associated with those reactor types.

MS. WATCHEMPINO: Can you name those reactors, existing fast reactors that are sodium-cooled or gas-cooled, where they exist?

DR. CARMACK: Yeah. There's two in Russia: one called BN-800, one called BN-600. There's a small one in China called CEFR, the Chinese

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Experimental Fast Reactor. There's another small one in Russia called BOR-60. I'm not sure what BOR stands for in the acronym. It might be a Russian acronym. But it's a small test reactor that is sodium-cooled. The Chinese also have a high-temperature gas reactor, referred to as, I believe, CHTGR. And then, there's a small test reactor in Japan called Joyo that hasn't operated since before the accident at Fukushima. But it technically still exists and could be restarted. I believe that's it.

MS. WATCHEMPINO: So you're not familiar with any operations occurring in the United States of fast reactors that are sodium-cooled or gas-cooled?

DR. CARMACK: So historically, we don't have any that are in operation today. The first sodium-cooled fast reactor, I believe, was Fermi reactor, and then EBR-I, then EBR-II. There was then the FFTF reactor that was located at Pacific Northwest National Laboratory in Washington state.

MS. WATCHEMPINO: Weren't there problems with the Fermi reactor?

DR. CARMACK: There were problems at Fermi reactor, EBR-I, FFTF. And then there were great strides that were made in demonstrating the safety

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capabilities of sodium-cooled fast reactors that were made at EBR-II. So both positives and negatives. And I think that's the point of these two new demonstration reactors, is to demonstrate all that's been learned and improved in the designs. And can they achieve the economics and safety advances that are envisioned for these reactor types?

The gas-cooled high-temperature gas reactor type is a very promising reactor technology that is based on a new fuel type that we refer to as TRISO fuel. It is a very robust fuel system that is made out of silicon carbide and graphite that are very high-temperature-resistant materials that can operate and sustain operation even at high temperature and hold their integrity at high temperature as well. So even above their normal operating temperatures, they can survive very high temperatures. So we refer to them as high-temperature-capable reactors that could survive off-normal events and safety -- and be much safer than in the past.

MS. WATCHEMPINO: Does that mean they would eliminate any chance of meltdowns?

DR. CARMACK: That is one of the goals of these reactor designs, is to have design features that allow them to eliminate the possibility and

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Comments from the Draft HALEU EIS Virtual Tribal Listening Session 1

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severity of such events. And that's actually what I was referring to in the demonstration that was made at EBR-II. It demonstrated in 1986 the capability to shut down after loss of power without additional forced cooling. And so it was a very challenging experiment to execute and envision. And EBR-II actually demonstrated the capability of the reactor technology, the sodium-cooled fast reactor technology, using metallic fuel to survive that event, which is effectively what happened at Fukushima in the light-water reactor technology.

MS. LOWE: Jesse Deer In Water, is there a question there, or?

MR. DEER IN WATER: Oh, no. I'm just here in Michigan. And I'm just referencing the song and the book "We Almost Lost Detroit," song by Gil Scott-Heron in reference to the partial meltdown at the Fermi 1 reactor. I do have a comment, though, whenever that time comes.

MS. LOWE: Okay. We're not quite there yet.

So any more questions?

MS. MORGAN: One quick question. This is Leona again. What is the time frame that the U.S. is realistically going to entertain reactors that

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would hypothetically use this fuel?

DR. CARMACK: So the demonstration reactors, the Natrium and X-energy 100 reactors are scheduled to come online in the mid- to late 2000s and certainly challenging -- they're challenged to begin operation by 2030.

MS. LOWE: We'll start the five-minute clock, give everybody -- oh, thank you.

MS. WATCHEMPINO: I have a question.

MS. LOWE: Oh, okay. Stop the clock.

MS. WATCHEMPINO: I just had to think of what my other question might be. If some facilities are identified -- for example, the Urenco enrichment site in New Mexico -- and during the presentation it was stated that there would be an environmental review for all sites. But not an environmental impact statement? What type of environmental review would take place, for example, at a site like Urenco facility?

MR. ANDERSON: Thanks for that question. So the environmental review, as to what level of NEPA review would be undertaken would be a decision of that other regulatory agency. And oftentimes, you know, speaking generically, new fuel cycle facilities often receive environmental impact

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statements. If one is existing and capability is increased, it may be a lower level of NEPA review, such as an environmental assessment. But at this point, it's hard for us to speculate what level of environmental review would be undertaken by those other agencies.

MS. WATCHEMPINO: And I think I just want to -- I'm concerned about the need for -- that transportation is involved at each of these steps. That was also stated in the presentation. And concerned that, even at this step in the draft EIS for HALEU -- HALEU -- how much is transportation discussed? And are small to moderate or large risks involved in that analysis?

MR. ANDERSON: We definitely analyzed transportation impacts in our EIS. And I'm going to refer back to the EIS for a moment as to how we categorized those impacts. So I believe that primarily we categorized the transportation impacts -- especially with respect to radiation emitted during transportation, that's one way we analyze that information. And that -- I believe the EIS indicates that we expect that to be small for transportation between fuel cycle activities, for example. And we've analyzed transportation impacts in several places

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throughout chapter 3 of the EIS.

MS. LOWE: And the EIS is available online.

MS. WATCHEMPINO: And have you identified the transportation corridors or routes?

MR. ANDERSON: Not specifically, because, you know, at this point we do not know which specific facilities are involved. So that would be difficult for us to speculate as to which transportation corridor specifically would be involved.

MS. WATCHEMPINO: And so, in order to say that the risk of -- from transportation and radiation emitted during transportation is small, how many times are you -- how many trips are used in the analysis? I mean, is it just one-time analysis of an impact; or would it be over a period of ten years, you know, once the facilities are identified and back and forth and throughout the entire process that these same -- I'll just throw out a corridor such as Interstate 40, if that were used. You know, is that -- are all those radiation emissions quantified in that analysis? It wouldn't just be one time.

MR. ANDERSON: Yeah. I believe that we estimated those impacts over time for the amount of

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material that we expect to be needed to be mined, for example, as a bounding scenario, for the amount of material that we intend to acquire. So that -- the answer to your question is yes; we attempted to have a broad analysis that would cover the amount of time needed and the amount of material that we expect to need to inform the transportation analysis.

MS. WATCHEMPINO: And would the analysis include a resident, you know, that -- that would be stationary and that would be exposed to all the radiation that is emitted during those trips?

MR. ANDERSON: That's a good question. I would have to review the information we have that informed the EIS. And we can get an answer.

Unless you recall, Mike?

MR. REIM: Yeah. The short answer is yes. But yeah; these are good questions. And we can refer back and go in more depth as well. I would just like to go -- so the answer is yes for that specific question.

Going back to just another kind of a side point, as Jon mentioned a while back, a lot of the steps involved in producing HALEU are very similar or in some cases identical to producing natural uranium to sell on the open market, whether that ends

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up in the existing low-enriched uranium reactor fleet or is held kind of almost as, you know, like a commodity to sell later. So in terms of routes, Jason's absolutely right. Without specific sites, we could not analyze exact routes that are certain. However, we were able to analyze the fact that there are some known locations for certain activities in the fuel cycle.

MS. WATCHEMPINO: And so I'm wondering, wouldn't there be a difference in the analysis for the enriched HALEU material as opposed to the raw -- the uranium being transported?

MR. REIM: In short, yes. There are differences. The material's in a different form. There's different volumes. There's obviously different enrichment level. But yeah; the answer to that is also yes.

MS. WATCHEMPINO: So I'm talking about the radiation emissions during transport of HALEU. It would be a lot different on a scale as compared to uranium, mined uranium?

MR. REIM: I'm sorry. You broke up a little bit. Do you mind repeating? Could you please repeat that?

MS. WATCHEMPINO: So my question was,

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what would the risk be of transporting HALEU material on these transportation routes? Wouldn't it be a different level of risk for residents along these routes from the radiation emitted from enriched uranium as opposed to mined uranium?

MR. ANDERSON: So I think I might add one thing, Mike. You know, until the HALEU is actually put in a reactor and irradiated, we're discussing, you know, fresh fuel impacts primarily in this EIS. You know, once it becomes, you know, spent fuel, it's more radioactive. And transportation impacts of that are, I think, pretty well understood. But for the purposes of this EIS, transportation of uranium as we're discussing, you know, is not irradiated fuel. So it would not be -- I guess I would say it would not be highly radioactive, if that's the way to say it.

DR. CARMACK: I was actually going to say that the enriched uranium actually has a lower amount of radioactivity by volume than low-enriched uranium because you're enriching more in the U-235 isotope. And the U-238 isotope, which is, you know, raw mined uranium, is actually of higher radioactive signature than U-235 is. And so it turns out to be less radiological in the fresh fuel form.

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In the -- after irradiation in the reactor, which -- Jason, correct me -- I don't believe this EIS considers post-irradiation and use in the reactor. It's only looking at the front-end production. That is under evaluation and will have to be considered in the design of packages and storage containers for the material. But that's beyond the scope of this EIS.

MS. WATCHEMPINO: Why is that? Shouldn't the -- 'cause that was going to be my next question. Where will the spent fuel from these facilities or the nuclear reactors be disposed? And this is the most dangerous as far as radiation emissions to people along the transportation --

DR. CARMACK: So that is actually beyond the scope of this EIS. And so it's being considered under other actions by the Department and the design of the reactor facilities themselves.

MS. WATCHEMPINO: Do you know what other actions or what area the Department would consider the transportation of spent fuel? And where would it be disposed of?

DR. CARMACK: It'll be disposed of -- similar to the disposal of fuel today, which, in the short term, is at the source of use or at the point of

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use, which is at the reactors. So what we do today is predominantly what will happen in the near term for these advanced reactors. And then, as we move forward with our consent-based siting activity for long-term storage of spent nuclear fuel, this will be included in those plans in the future. But, again, that's beyond the scope of this EIS.

MS. WATCHEMPINO: Thank you.

MS. LOWE: Jesse Deer In Water, did you want to ask your question?

MR. DEER IN WATER: Yeah. Just real quick. It's kind of about the options. Like -- like, this is a proposal; right? Like, this -- you all propose to do -- you all propose to facilitate this HALEU program; right? But there's another option to not do it, too; right?

MR. ANDERSON: Thanks for that question. That is correct. At this stage, DOE has a proposed action to acquire HALEU. And it has not made the decision, the final decision to do so. And one of the primary reasons that we have a public comment period for an EIS such as this is to solicit feedback from the public and Tribal nations. If there are alternatives that we are not recognizing or evaluating, we would appreciate hearing about those

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ideas as well.

MR. DEER IN WATER: All right. Thank you. Appreciate it.

MS. LOWE: Let's restart the five-minute clock.

MR. DEER IN WATER: Is this a waiting period between the comments, or is this for us to begin?

MS. LOWE: Just to reiterate, we're giving folks four more minutes to think of any questions they might want to ask. Once we move into the formal comment portion of the meeting, there will no longer be any answers of questions. So we just want to make sure you have a chance to ask any question.

Looks like maybe we got another question. I guess maybe we're good. So if you think of a question, let's ask it before we get to the part where there won't be any answers.

Oh. Rosemary Lonewolf, if you'd like to unmute yourself. Go ahead, Rosemary. Rosemary, if you can unmute yourself, you're welcome to go ahead with your question. Please start with your affiliation to your -- your Tribal affiliation.

MS. LONEWOLF: I'm trying to unmute.

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MS. LOWE: Great. Go ahead.

MS. LONEWOLF: Okay. I'm sorry. I'm not familiar with Zoom. I am computer illiterate, 70 years old.

MS. LOWE: You're live now, so no worries. Good.

MS. LONEWOLF: Okay. I'm from Santa Clara Pueblo, which I don't know if everyone knows is just down the road from Los Alamos. And if you will recall the Oppenheimer movie, recent production. We've been living with this for -- you know, this shadow of the nuclear, I don't know, possible disaster for -- for ages, it seems. And I'm just wondering right now. You did mention the cultural impact as being moderate. Is that -- was that the category that cultural -- when you were listing low, moderate, high.

MR. ANDERSON: I think that was correct.

MR. REIM: So low to moderate for existing fuel cycle facilities. I have to pull up the slides, actually. But there was three categories. There was the existing, things that are near existing fuel cycle facilities. I believe the analysis was a low impact. And then the brownfield, which is an industrial site that could be redeveloped or, you

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know, you could add fuel cycle facilities to an existing site was also low to moderate, I believe. And then there's greenfield, which would be a new, undisturbed site with a new facility, was the third category.

MS. LONEWOLF: So my second question, then, would be, would Los Alamos be -- what -- what would that be considered as, that location?

MR. REIM: So --

MS. LONEWOLF: Let's say if it was used for not -- obviously not the mining, but in the production. 'Cause we already have -- Lord knows what goes on up there. And of course, WIPP -- the WIPP transportation goes through not only our reservation but San Ildefonso and Pojoaque Pueblo. So it affects a lot of the Tribal nations in this area of New Mexico.

MR. REIM: Understood. And thank you for that question. So I think I can partially answer it, and then maybe Jon or Jason can also help me out a little bit. Regarding the question, I think the first part of your question was, you know, would Los Alamos be considered, you know, a brownfield site or a greenfield site or an existing fuel cycle facility.

It's not a greenfield -- well, if we're

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talking about -- so there's the lab versus the town as well. Were you referring to Los Alamos as the town or specifically the lab?

MS. LONEWOLF: More such the lab. The lab itself.

MR. REIM: Okay. Understood.

MS. LONEWOLF: But of course, Los Alamos is -- you know, that's a lot of people that live there, too.

MR. REIM: So we were not anticipating national labs bidding and developing commercial fuel cycle facilities as part of this.

Is that correct, Jon? Is that how you would characterize that?

DR. CARMACK: Yeah. I think it's possible that a company could propose to work with a national laboratory site and develop a facility. But I think largely this EIS is structured around a commercial civilian enterprise that will ultimately be licensed and authorized by either the agreement state regulatory body working with the Nuclear Regulatory Commission, and as such, would require -- any new facilities built for commercial production would require additional study and regulatory approval.

MR. ANDERSON: And I would add that the

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DOE does have an environmental impact statement that does analyze continued operation of the Los Alamos National Laboratory. And it's called a site-wide environmental impact statement. That is not an effort that we've been involved with here on the panel and I'm not overly familiar with it. But the environmental analysis to that effect does exist.

MS. LONEWOLF: Okay. One last question. This third question is about, is there a date, a projected date, for a decision on the RFPs, your -- your request for proposals? Has there been a date set to make that decision?

DR. CARMACK: There's not a specific date set for the selection or award of RFPs. It's currently underway and the proposals are being evaluated against the terms of the request. We expect that they will be adjudicated in the next few months. And then sometime in the summer, awards would be potentially announced. And then, following that, there would be a contract negotiation period before activities would commence.

MS. LONEWOLF: Okay. And would we be notified of those decision dates? Will there be more meetings for comments?

DR. CARMACK: The Department will

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announce publicly the selection of awardees and publish it on its website.

MS. LONEWOLF: Okay. I believe that's all the questions I have for right now. Thank you.

MS. LOWE: Thank you, Rosemary.

Laura Watchempino?

MS. WATCHEMPINO: Yes. Maybe a follow-up to Rosemary's question about the decisions that will be made on site -- facility site selection. Is there going to be any outreach to Tribes or communities or the public as far as those decisions go? I mean, it's not like we visit the website on a regular basis. And we don't know exactly when to expect these decisions. And you have our contact information. Is there any other way you can do outreach to communities and the public about decisions for HALEU enrichment throughout -- you know, throughout all phases?

DR. CARMACK: So thank you for that question, Laura. As a department, we understand and empathize with the concerns from our Tribal communities and nations about potential facilities and impacts. And so, although we don't have an exact idea of where and which facilities will be impacted, as a department we have a duty and responsibility to notify

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Tribes of actions that may impact them. And so, once locations are known, we have a responsibility to notify the affected Tribal communities.

MS. WATCHEMPINO: And at that point, will government-to-government Tribal consultation opportunities be available? Will they be notified at that time? Will Tribes be notified at that time?

MR. ANDERSON: The DOE understands and shares, you know, interest in preserving historical and cultural resources. You know, currently, we're not at the point of making decisions regarding specific facilities or activities and are not pursuing activities that are right for Section 106 consultation specifically. Should DOE initiate Section 106 consultation, DOE commits to consulting with Indian Tribes on a government-to-government basis consistent with the relevant provisions in the regulations governing Section 106 consultation found at 36 C.F.R part 800. In the meantime, DOE continues to encourage Tribal participation and remains available for government-to-government consultations consistent with our trust responsibilities.

MS. LOWE: Clock on again, I guess. Restart the five-minute time clock just to give everyone a last few moments to think about any

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questions you might have before we start the comment portion of this listening session. You're also welcome to scroll up through the chat and find the various addresses. So there's the website address for the HALEU EIS. There's the address for submitting comments. There's both an e-mail address and a written -- for U.S. Post Office mail. Those are appropriate addresses for requesting to enter into consultation.

Laura's hand has gone up.

MS. WATCHEMPINO: Yes. On the question I asked earlier about the Department consulting with Tribes once facilities are identified, the answer was that the Department will notify Tribes of facilities. But is that just kind of a determination made by the Department that this facility might be of concern, for example, to Tribes in New Mexico? But what about all the facilities nationwide? Will the Tribes be notified of all those facilities?

MS. LOWE: I think there was a question as to whether Tribes will be notified once the selections are made.

DR. CARMACK: Yeah. I think I'll repeat what my answer was before, is that we have a duty that -- after we've identified specific

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facilities, notifying the potentially impacted Tribal communities is a responsibility of DOE.

MS. WATCHEMPINO: I think that's what spurred my question, is that -- how will DOE make that determination, that potentially impacted Tribes?

DR. CARMACK: It's a good question. And I think we'll have to get back to you on how we will determine potential impacts.

MS. WATCHEMPINO: Thank you.

MS. LOWE: I think we're about halfway through. So can we do a two and a half minute clock instead of five? I see there's interest in moving on. Oh, Leona has a question.

Leona, is your hand up?

MS. MORGAN: Oh, no; I was trying to do a thumbs up to two minutes instead of five.

MS. LOWE: Okay. Got you. Okay. And Laura's done asking, I think. There we go. Two and a half minutes. Please make note of the addresses that are in the chat. If you have -- if you got here to this session tonight, you've been on the website already. So that's the same website where information will be available. Both the EIS is available there as well as information about listening sessions and how to register.

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Oh, Laura, is your hand back up?

Okay. We're appreciative of the questions that have been raised so far. It is now 7:20 p.m. Eastern, and the Q & A portion of this listening session has been officially concluded.

During this final portion of this listening session, we will begin accepting formal comments on the draft environmental impact statement. Michael Reim, Jon Carmack, and Jason Anderson will be here to listen to your comments on behalf of the Department of Energy. But they are just here to listen. They will not be responding to anything that's said during the comment portion of this listening session. We also have someone who's transcribing each comment that's provided during the listening session. Please try to speak clearly when I call on you to speak into your microphone so that we can accurately record your comments.

I'd like to emphasize that sharing your comments during this virtual listening session is only one of the ways that you can participate in the environmental impact statement process. You can also submit written comments via the U.S. mail or e-mail. I'm going to basically read the slide here. Written comments on the draft EIS should be sent to Mr. James

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Lovejoy, who is DOE's document manager for the environmental impact statement. Send those to the U.S. Department of Energy, Idaho Operations Office, located at 1955 Fremont Avenue, mail stop 1235, which is in Idaho Falls, Idaho, 83415. If you prefer, you can send your comments by e-mail to HALEU -- H-A-L-E-U -- hyphen EIS at nuclear.energy.gov. And those two addresses can also be used to be added to the mailing list for project notification and to request government-to-government consultation.

DOE will consider all comments received or postmarked by the end of the comment period, which will end on April 22, 2024. All comments will be given equal consideration, regardless of whether they're submitted orally or in writing. All comments received throughout the comment period will be included in a comment response document. And the comment response document will include DOE's responses to the comments that have been received, and it will be included in the final EIS.

You can let us know that you're interested in commenting the same mechanism that we used in the question-and-answer, by raising your hand in the Zoom function. It'll keep track of who's raised their hand and I'll call on people in order, in

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the first-come-first-served order that you've registered an interest in speaking. If you're interested and you're on telephone, you can put your hand up by dialing nine -- or excuse me -- star 9.

As I suggested during the question-and-answer portion of the listening session, we'd like to invite Tribal leaders to comment first, followed by Tribal staff. When you're called on, please introduce yourself with your Tribal affiliation as you begin. We're not going to limit the amount of time that anyone has to speak, but we hope everyone will be respectful that there are others here that may wish to provide comments. Additionally, formal comments can be submitted through the chat functions. At the end of the meeting, we'll save the chat session; and those comments will be submitted and entered into the official record for the project.

I'd like to stress that in this third portion of the listening session we will not be responding to questions. And if you've framed anything in the question-and-answers that you think you want DOE to consider as a comment, we'd invite you to repeat it during this comment portion so that DOE will address it when they finalize -- or prepare their final EIS.

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So the formal comment portion of this listening session will continue until there are no more raised hands or comments in the chat. And at that time, I'll give another five-minute warning to request additional comments. When there are no other comments, we will conclude the meeting.

When we're actively taking comments, I'll call on two names at a time so that you'll know your turn is coming up. Please begin by stating your name and your Tribal affiliation.

So one final request that I'd make of you tonight. I know that some of you may have strong opinions about DOE's proposal. And we hope everyone will share their opinions in a respectful manner. We're grateful that you've taken time out of your busy schedules to participate in this virtual listening session. And we're thankful for all Tribal input that we get on the draft environmental impact statement.

So with that, we'll begin listening to comments. So if you're interested in making a comment, please raise your hand. Well, I see one hand.

So Jesse Deer In Water, you can go ahead.

MR. DEER IN WATER: Good day, you all.

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Comments from the Draft HALEU EIS Virtual Tribal Listening Session 1
Westfields Marriott Washington Dulles Hotel, 14750 Conference Center Drive, Madison Room, Chantilly, VA, April 10, 2024, 6PM

My name's Jesse James Deer In Water. I'm a citizen of the Cherokee Nation of Oklahoma. I come from a community that now has a Superfund site in Oklahoma that was a uranium processing plant at the Kerr-McGee facility. So I'm -- I'm familiar with some of the different processes and the impacts that can happen. We're no longer really safely allowed to forage any food or hunt or fish from around that area, and probably never will be able to. But, that aside -- that's my start.

I now live in Michigan in the Detroit area -- North Redford, actually -- and am a member of a group Citizens' Resistance at Fermi Two. We're an Indigenous-led organization that basically, you know, opposes nuclear in general. We're nuclear abolitionists. But within this process, accountability, safety, health, wellbeing, economics -- to not just human relatives but also all other earthly relatives, nonhuman and elemental alike.

So I represent quite a few different smaller communities of people that have concerns with nuclear power and especially this new small modular reactors. They actually oppose this pathway and would choose to do the pathway of no action not only because we already experience radioactivity -- radioactive

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117-1 In general, the Proposed Action represents a smaller scale level of activity and footprint compared to the activities and footprints evaluated in the existing NEPA evaluations. For example, the requirements for HALEU commercialization would be about 20% of the conversion capacity of the Metropolis facility. In addition, HALEU enrichment would require 1.1 million separative work units (SWUs) per year, which is 37% of the capacity of UUSA (3 million SWUs). The relatively smaller scale was factored into the SMEs' evaluations and reflected in the impact assessment categories identified in this EIS. Similarly, expansion of ISR or conventional mining operations in existing permitted locations already contain existing infrastructure and similar activities/impacts compared to the activities and footprints evaluated in the existing NEPA evaluations (often evaluating an entirely new facility). Changes in regulations or industry standard practices for reducing or eliminating potential for impact also factor into smaller scale impacts than those determined in previous (earlier) NEPA evaluation. Please reference Section 2.4, "Legacy Issues," of this CRD for further discussion regarding legacy impacts. The Final EIS has been updated to include specific links to the appropriate section of the Technical Report (Leidos, 2023), which provides more detailed analyses of the bases for the conclusions, especially those conclusions where the impacts were judged by the SMEs and supporting NEPA analyses to be "small." The Final EIS has also been revised to include the approach and reference to the Technical Report in the Summary and Volumes 1 and 2 to provide the reader with a better understanding of how the authors of the EIS used the information from existing NEPA documents to estimate impacts for the Proposed Actions' HALEU fuel cycle activities.

117-2 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. Section 2.6.1, "Proposed Action," of Volume 1 of the Final EIS includes a full list of resource areas covered in the Final EIS. These resources include, but are not limited to, impacts to human beings (i.e., historic and cultural resources, public and occupational health, socioeconomics, environmental justice, and human health impacts from transportation), impacts to non-human resources (i.e., ecological resources), and impacts to elemental resources (land use, geology and soils, water resources, and air quality). DOE acknowledges your opposition to the Proposed

elements in our drinking waters, elevated -- around plants, reactors that already exist. But we're also in solidarity with our Indigenous relatives in the Southwest and in communities like mine, Pueblo and Dine communities where the uranium comes from, where it will be processed, where it will be fabricated before it comes to small modular reactors here.

We'd also like to get a comment period extension so that we could properly have some of our folks, Indigenous communities, submit comments based on our perspectives and what's important to our communities on time. I know that you all give notice to the Tribal governments, but the Tribal government process is -- is kind of slow. And historically, Tribal government processes have been slow in our communities. Not just Native communities, but environmental justice communities have been ignored because only certain peoples from our communities have been spoken to. So not all of us are always represented. So we would like a comment extension so that we can feel that we've properly represented.

I have people from, like, five different of the federally recognized Anishinaabe Tribes here in Michigan, Ojibwe, Odawa, and Potawatomi. We also have -- this is more the

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Action and support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

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117-3 Individual comment extensions were granted to Tribal members requesting such extensions. This included Jesse Deer in Water who made a request for extension during the Tribal listening sessions. DOE did not receive similar comment period extension requests from environmental justice communities. For more information about how DOE decided a formal extension was unnecessary, please reference the response provided in Section 2.7, "NEPA Process."

specifics. We have concern -- I'll try to keep it rolling here. But we also have specifics about -- concerns about the amount of HALEU fuel that you all propose, 200 tons. We know that this is three to five times more enriched than the regular fuel, so it will take three to five times more uranium. And if one to two pounds of uranium comes from every ton of ore, if we're aiming for 200 tons, you multiply the 200 by the one -- one or two -- you multiply the one or two pounds per ton of ore and you multiply that to get your ton. And then you all want 200 tons. That's somewhere probably around, like 40 million -- this is a rough estimate off the top of my head, 400 million tons of raw uranium for this 200 tons of HALEU fuel for these reactors that we don't even know if they're going to work yet. That seems ridiculous. That seems like an excessive amount of a burden to put on communities that already suffer burdens from uranium mining historically.

And then, this is not even to mention that within this plan, the DOE and the United States and the companies that will be producing these small modular reactors want to export them throughout the world. And the United States also intends on being a big exporter of the HALEU fuel so that they can curb

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117-4 As stated in Section 1.1 of the EIS, DOE projects the need of 40 MT per year by 2030 and 50 MT for commercial use by 2035. Section 1.3 of the EIS estimates that a maximum of 290 MT HALEU will be needed to establish a temporary domestic demand for HALEU to stimulate a diverse, domestic commercial supply that would ultimately lead to a competitive HALEU market. The amount of uranium-bearing ore and U_3O_8 that would need to be mined to achieve production of 290 MT of HALEU (approximately 14,600 MT of U_3O_8 and 15.4 million MT of uranium-bearing ore) is discussed in Section 3.1.

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117-5 The Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use, and to make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. Future sales of reactor technologies, including international sales, is speculative and outside the scope of this EIS. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

Russia 'cause Russia has the lock on it. We know that 75 percent of the fuel in the world comes from Russia or Russian-owned companies. America wants to counter that. So for "national security," quote unquote -- if you can see me, I'm air-quoting here -- that's not prudent. That's not healthy. That's not safe.

The moral debt that the United States owes Indigenous communities for the progress of the United States of America is endless. Clean up the uranium mines that already exist. Stop producing more nuclear. There's a different pathway. While 22 or 30 countries pledged to triple nuclear power as their carbon -- or as their climate pledge during the last COP, over 120 other countries promised to triple their -- I mean, their renewable capacities.

And so, you know, the DOE has a lot to think about here. The United States has a lot to think about here. If we are truly a just society, we would acknowledge the historic impacts, and we would seek to curb future things from happening or repeating our past and current mistakes that we're still paying for and the communities are still paying for.

With that, I'll go ahead and end my comment. I would like to comment towards some, like, actual -- like, towards some of the scientific stuff

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117-6 While it is correct that the United States is trying to find alternatives to its reliance on imported uranium and/or HALEU from foreign sources, export of HALEU fuel falls outside the scope of this EIS. The Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use, and to make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

117-7 While DOE empathizes with Indigenous communities harmed by historic uranium practices, legacy impacts including the closure of existing uranium mines fall outside the scope of the HALEU EIS. Please see Section 2.4, "Legacy Issues," of the CRD for additional information on this topic and DOE's response. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

117-8 A country's decisions on the approaches to address climate change can be driven by many factors considering different starting points and circumstances; not all of which depend on the merits of the technologies themselves. Note that the pledge signed at COP 28 to triple renewables does not include a commitment to abandon nuclear electric power generation (the United States signed the pledge.) The United Nations International Panel on Climate Change (IPPC) report (Global Warming of 1.5 degrees C) evaluates pathways for future energy production and in of these pathways energy production from nuclear power increases over worldwide 2010 production, in one pathway doubling by 2050. The report supports the position that nuclear power is an important tool for combating climate change (ORONO, 2024) (For all about the IPCC report on climate change web page, visit https://www.orano.group/en/unpacking-nuclear/all-about-the-ipcc-report-on-climate-change.) The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (see Section 2.2, "Purpose and Need" of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore,

supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

117-9 DOE acknowledges the occurrence of legacy contamination that has occurred from past uranium recovery and enrichment activities and your concerns. Please see Section 2.4, "Legacy Issues," of the CRD for additional information about this issue.

towards it; but I felt like that needed to be said as we open this. Thank you, and I will let other folks speak now.

MS. LOWE: Thank you so much, Mr. Deer In Water.

Tim Wilcox has his hand up.

MR. WILCOX: Hello. I'm Tim Wilcox. I'm the Tribal archaeologist for Agua Caliente Band of Cahuilla Indians in Palm Springs, California. But my heritage is Navajo and Tewa from Ohkay Owingeh Pueblo in New Mexico.

And I just wanted to say that, especially the Navajo Tribe, we have a horrific history with uranium. Our reservations have been, like, used as uranium sources. And our people have been used for manpower during uranium booms. Many times, the -- I'm -- since I'm an archaeologist, I had to go survey open uranium mines on the reservation that were left since the 50s. And there's livestock at the bottom of the pits drinking the water. And in those communities, there's also still children suffering medical conditions related to uranium exposure.

And even though there is no mining taking place with this proposal, I think the

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118-1 DOE acknowledges the occurrence of legacy contamination that has occurred from past uranium recovery and enrichment activities and your concerns. Please see Section 2.4, "Legacy Issues," of the CRD for additional information about this issue.

118-2 DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices.

For additional information see Section 2.4, "Legacy Issues," of this CRD.

118-3 The EIS does not analyze site-specific locations. It would not be practical to prepare site-specific transportation analysis, for example, the Grand Canyon uranium mine, in this EIS. However, a detailed transportation analysis was performed for this EIS. Both radiological and nonradiological transportation impacts are described in Section 3.6, "Transportation," of the EIS and Section A.6, "Transportation," of Appendix A. Radiological impacts are those associated with the effects from low levels of radiation emitted during incident-free transportation and from the accidental release of radioactive materials. Nonradiological impacts are independent of the nature of the cargo being transported and are expressed as traffic accident fatalities resulting only from the physical forces that accidents could impart to humans. Details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Since the EIS does not identify specific locations for fuel cycle facilities, the EIS transportation analysis used some conservative assumptions about the distances traveled during transportation (considering longest distances between the potential locations/facilities of source and product materials [e.g., mines to conversion, conversions to enrichment, enrichment to fuel fabrication and/or deconversion, and deconversion to storage]). Therefore, the analysis is expected to bound the impacts regardless of where the facilities would be located. The analysis considered transportation of all forms of uranium materials: from the

transportation routes are a big concern because the -- the Grand Canyon uranium mine, they proposed routes through the Navajo Nation. So this is in our recent memory. And so, I mean, even though I'm representing Agua Caliente Cahuilla people, it's the -- it's the transportation. That's why I'm here. Because Interstate 10 is a major thoroughfare that runs right, you know, right through the reservation. And yeah. That's what I think. Since we're not mining, I think the transportation and then the processing plants would -- would be a big concern, especially for Tribes that have already been through this history.

And I just wanted to point out, like, when you guys were saying that updates would be on the website, you just need to realize that Tribes have different capacities and manpower. We have a pretty big staff in my office, and we're already overwhelmed by the Executive and Secretarial Orders that are mandating consultation, Section 106 consultations. So I don't know. I think you need to try a little harder to notify Tribal communities. Thank you.

MS. LOWE: Thank you, Mr. Wilcox.

Leona without a last name has signed up. But, Leona, would you begin with your name and your Tribal affiliation?

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mines to the mills, from an ISR or mill to the conversion facility, from the conversion facility to enrichment facilities, from the enrichment facility to a deconversion facility, from the deconversion facility to a storage facility, and from the storage facility to the fuel fabrication facility. For the transportation analysis, all facilities were conservatively assumed to be independently sited (i.e., no co-location of facilities). As discussed in Section 3.6 and in Section A.6 of Appendix A of the Final HALEU EIS, the transportation activities would result in a small collective population risk, which is a measure of the total risk posed to society as a whole. Specific details of the analyses are in Section 6 of the Technical Report (Leidos, 2023). Table A-8 of Appendix A in the Final HALEU EIS summarizes the transportation risks for each activity within the HALEU fuel cycle. Specific analysis of the route cited in the comment is outside the scope of this EIS. However, site-specific locations are expected to be proposed in the future and would be evaluated by the cognizant regulatory agency, in many cases the Nuclear Regulatory Commission (NRC) and specific transportation routes and related impacts are expected to be evaluated during that process. See also Section 2.6, "Transportation," of the CRD for additional information.

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118-4 Thank you for taking the time and effort to share this perspective. The Tribal listening sessions were specifically implemented to listen to Tribal perspectives so DOE could more meaningfully consider Tribal concerns and engage with Tribes. Going forward the Office of Nuclear Energy will take into consideration Tribal capacity and offer different and more accessible mechanisms when notifying not only Tribal governments, but also Tribal communities. See Section 1.3.1 of the EIS for additional information on DOE's public outreach, including to Tribes.

Comments from the Draft HALEU EIS Virtual Tribal Listening Session 1
Westfields Marriott Washington Dulles Hotel, 14750 Conference Center Drive, Madison Room, Chantilly, VA, April 10, 2024, 6PM

MS. MORGAN: Sure. My name is Leona Morgan. And -- I'm sorry. I'm trying to silence my computer here. Yeah. (Speaking Navajo)

I am Dine, so I'm a member of the Navajo Nation. I'm not a staff or in any official capacity. I'm just a member of the Tribe. And as such, I've been watching uranium issues since 2007, since the last spike in the price of uranium which started to drive this artificial push for new uranium development. So my comments are largely about that.

Regarding the earlier comments about, first of all, the use of environmental reviews, I think it's absolutely necessary that any new projects require a full NEPA -- from whatever agency. So this cannot -- what I'm saying is, HALEU and any type of related activities should not be permitted through license amendments. There should be a whole new set of whatever needs to happen to -- to review these things. Because it's a new -- it's a new processing.

Oh, and then, first of all, I just want to say I'm against this. I don't think it's necessary. I would say that the DOE should not pursue this.

And also, again, to reiterate, we do need an extension in the comment period, especially

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119-1 Site-specific location of facilities are not being analyzed this EIS. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). Whether licensing amendments are adequate for construction, modification, and operation of HALEU facilities will be up to the discretion of those authorities. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

119-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

119-3 Individual comment extensions were granted to Tribal members requesting such extensions. This included Leona Morgan.

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since the Tribal meetings are just a week or so -- just a few days ahead of the deadline for the comment meeting. So we definitely need a extension in the comment period.

But yeah. Going back to some of the permitting and on all of that, it's -- I think in the EIS there's a lot of information lacking regarding not just the front end but, especially to Laura's point, that the spent fuel, if that's going to be more irradiated in the end, that needs to be considered. That absolutely must be part of the EIS. I don't know how that can be omitted. And yeah.

I think also on page 14, it talks about how HALEU is -- is -- I completely disagree with this statement. And I think -- I think the EIS needs to consider another perspective. On page 14, it says that there's an insufficient domestic commercial capability to -- to produce -- well, basically that so much HALEU is needed and -- and we don't -- we're not producing enough. But that doesn't make any sense if any of the use of HALEU is not even going to come online until at least 2030, like was said during the meeting. So HALEU is not necessary. Uranium mining is not necessary considering the wealth of weapons the United States has.

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119-4 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

So according to the United Nations -- of course, the United States hasn't signed onto this -- but nuclear weapons are illegal according to the Treaty on the Prohibition of Nuclear Weapons. And so, as such, the U.S. needs to consider how to dismantle those weapons. I'm not a proponent -- I'm not advocating for the use of weapons for HALEU. But I'm just saying that HALEU does not necessitate -- is not necessary and does not necessitate new mining or new production because these new reactors don't even exist.

And at the rate of current reactors going -- new reactors going online, looking at Plant Vogtle as an example. Plant Vogtle was severely over-budget and over their deadline. And so, looking at what the EIS is saying about HALEU being necessary, that's absolutely not true. And so I think the EIS is -- is not considering other alternatives that could replace whatever said energy HALEU is supposed to produce, such as solar and, you know. I think -- I think the EIS needs to also consider the equivalent types of energies that can be produced.

Because nuclear, as it was said earlier, as a member of the Navajo Nation, we're devastated with existing uranium mines from the

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119-5 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Please refer to Section 2.2, "Purpose and Need," of this CRD and Section 1.1 of the EIS for further discussion of the purpose and need and basis for the estimated HALEU amount needed. DOE's Proposed Action is intended to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability.

119-6 Dismantling weapons and using the HEU to make HALEU would require downblending. Downblending is not part of the Proposed Action. See Section 1.5 of the Final EIS for the Proposed Action activities. As stated in the EIS, (see Section 2.4 of the EIS, alternatives considered but dismissed from detailed analysis) downblending would not provide sufficient amounts of HALEU and would not meet the purpose and need.

119-7 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Section 1.1 of the EIS in which DOE has clarified the purpose and need, including the basis for the projections of HALEU needed. As written, DOE believes the purpose and need (in Summary, Section S.2, and Volume 1, Section 1.1) clearly indicates that the intent of DOE's Proposed Action is to fulfill the Congressional direction in Section 2001(a)(2)(D)(v) and to facilitate the development of a domestic HALEU fuel cycle through procurement of up to 290 MT of HALEU. The Proposed

Department of Energy defense-related mining. And even though the DOE only claims a little bit over 4,000, we have in the whole country between 15- and 20,000 abandoned uranium mines. So just like Jesse said, we need a moratorium on all new activities until the DOE and -- and the former Atomic Energy Commission or NRC and EPA can pay for and -- and do the necessary cleanup of all the abandoned uranium mines and other nuclear facilities in the country that are contaminating our environments, making our people sick, and -- and basically killing, you know, communities that live near these facilities.

So right now, the DOE and -- and others are responsible parties for these facilities. They say that there's companies out there that did the mining and they're trying to find the so-called possibly or potentially responsible parties. But at the end of the day, these are defense-related mines that the DOE was using. It's not the company's responsibility to clean these up. It's the United States' responsibility to clean all of these sites up. So I'm just saying, for the record, the DOE and others need to put a moratorium on new activities until all of the old contamination is -- is cleaned up to community satisfaction.

119-9 (cont'd)

Action is intended to incentivize development of a domestic HALEU fuel cycle in order to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. DOE expects that once incentivized, the commercial industry would undertake future HALEU activities without DOE involvement. See also Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of the CRD for further discussion of these topics. Note that Plant Vogtle uses LEU fuel not HALEU fuel and is outside the scope of the HALEU EIS.

119-8 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

I'll just stop there for now. And I know I have more comments. Well, actually, let me just say one more thing; and then I'll hopefully get all of my written comments together.

Right now, we're dealing with a new uranium mine at the Grand Canyon. And HALEU is promoting and -- and as the national -- the -- basically the Nuclear Security -- Nuclear Fuel Securities Act and the proposal for HALEU all contradict and violate the Navajo Nation's fundamental laws, which are basically our -- our traditional teachings that have been codified into Navajo Nation law. So, you know, it's against our -- it's against the Navajo Nation fundamental law to do a lot of things, of course, the Navajo Nation has engaged in.

But we have new laws today -- from 2005, there's a law against uranium mining. I'm sure you're well aware. There's a 2012 transportation law that is -- that is -- is for the purpose of prohibiting transportation of radioactive materials. However, due to the lack of sovereignty of the -- true, full, 100 percent sovereignty -- because of the lack of true sovereignty, the Navajo Nation doesn't have control over the roads.

And so, right now, even though uranium

119-9 **119-9** DOE acknowledges your concerns regarding legacy contamination and opposition to the Proposed Action. Legacy issues are outside the scope of the HALEU EIS, but are discussed in Section A.1.3.12, Legacy Health Issues," in Vol. 2 of the Final EIS. Please also reference Sections 2.1, "Support and Opposition," and 2.4, "Legacy Issues," of this CRD for more information.

119-10 **119-10** Thank you for your comment. DOE acknowledges your concern related to the possibility of radioactive material being transported on roads that intersect Navajo Nation lands. Like all commercial activities, HALEU fuel cycle activities would be expected to be conducted in compliance with all applicable laws and regulations.

mining is happening outside of the Nation, HALEU and other activities are in -- in support of new mining that violates our law against mining. So basically, everything that is being proposed is violating Navajo Nation law, is what I'm trying to say: the -- the -- you know, the proposal and -- and support for new uranium development as well as transportation.

So I'll stop there and say thank you. And -- and yeah. If we -- if I can comment again at the end, I -- I would appreciate more time. But I'll leave the time for other speakers. Thank you.

MS. LOWE: Thank you, Ms. Morgan.

Laura Watchempino?

MS. WATCHEMPINO: Thank you. My name is Laura Watchempino, a member of the Acoma Pueblo located in New Mexico. And Acoma has -- has a claim to be one of the longest continuous -- continuously inhabited settlements in North America. So we hope that my comments as a member and -- and any Tribal comments submitted are -- take that into account and the fact that there is a lot of Indigenous knowledge and knowing how to live in our place in the world in harmony with all the elements, with all the vegetation, with all the life -- plant, animal life as well as human life -- and all the neighbors that we

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120-1 DOE recognizes and appreciates the importance of Indigenous knowledge and how such knowledge can better shape the findings of environmental reviews. DOE will, to the best of its ability, consider the feedback presented in your comments. Please note, however, that DOE will not be selecting specific sites as part of this EIS, and therefore, cannot effectively consider information for specific locations. It is likely that the NRC or the applicable state or Federal agency would consider Indigenous knowledge in their site-specific NEPA or equivalent environmental review process.

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inhabit this area of the earth with.

So I would -- I'll now get into my comments. I want to state that there should be -- of HALEU. It is not necessary. And it's -- it's premature because there are, as yet, no operating advanced nuclear reactors that have been proven with a proven record of operation and safety. So it's -- it doesn't make sense to be producing this fuel with -- at this stage.

And existing commercial sites also have the same problem of disposal. Where is the spent fuel going to go? That's another reason that we don't need more facilities producing the material for nuclear reactors that are going to produce more spent fuel when the Department of Energy hasn't yet identified a site to dispose of this material. So I will continue to reiterate that the -- that this HALEU production is not necessary.

It does violate the international Treaty on the Prohibition of Nuclear Weapons. And that should be -- international laws should be taken into consideration and should've been taken into consideration in this decision. And another support for the fact that this HALEU production is not necessary is that it appears that most of it will be

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120-2 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Regarding comments about the speculative nature of the advanced reactors, while it is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. Please see Section 1.1 of the EIS. Please also refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for a further discussion of these topics and DOE's response.

120-3 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste

exported and not used in the United States.

And another note on the history of the Grants Uranium Mining District in New Mexico where mining occurred for at least 50 years, 50 to 70 years during the last century, from the 1950s until about 1990. And in the Grants Uranium Mining District, there were several Superfund sites. And they were mainly mills, mill sites. Some have been decommissioned, but there's still one that is not fully decommissioned. And even the sites that are decommissioned have uranium tailings material that continues to leak and contributes to contamination plumes in our regional groundwater supplies.

So this is the reason for requesting a moratorium on HALEU production as well as new uranium mining. Anything that would contribute to more contamination in our region is an environmental injustice. It's an environmental injustice to Indigenous communities that inhabit these watersheds and our homelands.

I also want to state that any licensing by the Nuclear Regulatory Commission should be a brand-new license. No license amendment requests should be used to venture into license amendments for HALEU enrichment facilities.

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management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

120-4 See the response to Comment 0120-2.

120-5 The United States is not a signatory to the Treaty on the Prohibition of Nuclear Weapons. The United States is a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which promotes the peaceful uses of nuclear energy and the USG will continue to support the highest standards and practices of safeguards, security, and safety of any HALEU fuel cycle. Additionally, the Proposed Action is focused on a domestic HALEU fuel cycle. As described in Section 1.0.2, "Why Do We Need More HALEU?" of the HALEU EIS, the Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use, and to make such HALEU available to members of a DOE HALEU consortium by January 1, 2026 (Section 2001 of the Energy Act of 2020 (a)(1); (2)(H) [42 U.S.C. §16281(a)(1); (2)(H)]). The Proposed Action does not include production of HALEU for military use.

And I'll go ahead and defer if there's any other comments. I might have some follow-up comments. And I may also have some written comments following this.

Oh, yes. Sorry. I did have one more comment, and that is to request for an extension for Tribes to respond to this draft EIS. April 22nd is just a week away. And that's not enough time for Tribes to do extensive and -- extensive comments to this draft EIS. Tribes are very busy with all kinds of threats to their homelands. And they need more time to -- to review this draft EIS and to comment. So I'm requesting a minimum of 90 days' extension for Tribes to have adequate time to comment.

There weren't many Tribal -- I didn't notice any Tribal officials, leaders commenting today. And -- and that just illustrates my point that Tribes are -- have a lot of work to do, and it's not just on this one issue. So they may not have had time to tune in today for the webinar. But I'm sure that they are going to be hearing more about this. And they may -- April 22nd is just too soon for Tribes to submit comments. And I'll go ahead and stop for now. Thank you.

MS. LOWE: Thank you, Ms. Watchempino.

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120-6 The Energy Act of 2020 states that the HALEU is for civilian domestic use. As described in Section 1.0.2 of the HALEU EIS, the Energy Act of 2020 directs DOE to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use, and to make such HALEU available to members of a DOE HALEU consortium by January 1, 2026 (Section 2001 of the Energy Act of 2020 (a)(1); (2)(H) [42 U.S.C. §16281(a)(1); (2)(H)]). Also, see the response to Comment 0120-T-2. The Proposed Action does not include the export of HALEU.

120-7 DOE acknowledges the occurrence of legacy contamination that has occurred from past uranium recovery and enrichment and your concerns as well as opposition to the Proposed Action. Please see Sections 2.1 "Support and Opposition" and 2.4, "Legacy Issues," of the CRD for additional information about these issues. As discussed in response to your Comment 0124-T-3, the EIS does address potential adverse and disproportionate environmental effects and risks to communities with environmental justice concerns.

120-8 Site-specific location of facilities are not being analyzed this EIS. Future HALEU facility locations and their associated processes and technologies would be subject to further environmental analysis under the relevant regulatory authority (primarily NRC). Whether licensing amendments are adequate for construction, modification, and operation of HALEU facilities will be up to the discretion of those authorities. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

120-9 Individual comment extensions were granted to Tribal members requesting such extensions. This included an extension for the commenter. Additional extensions would have been granted to accommodate interested Tribal leaders, however, no extension requests were received by any Tribal leader, government, or their delegates.

I hope I'm getting it halfway right.
MS. WATCHEMPINO: Yes. That's correct, Watchempino.
MS. LOWE: I believe that Leona might have additional comments.
MS. MORGAN: I -- I would like to leave space for other folks that haven't commented.
MS. LOWE: Well, there are currently no hands up.
MS. MORGAN: I'm going to raise my hand for later. But I'll let others go ahead and --
MS. LOWE: Rosemary Lonewolf has raised her hand.
MS. LONEWOLF: Okay. Thank you. I'm back again. I really appreciate the comments from my fellow Native Tribal members. I just want to state that here at Santa Clara, we were only notified -- we only got notification of this meeting this past Friday. And -- and the people that I already talked to, I said, "Are you going to participate? Are you going to answer or, you know, log on?" They didn't even see it in the newsletter. It was just in such tiny fine print.
So I agree with the other comments that the -- there should be an extension to respond

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121-1 Individual comment extensions were granted to Tribal members requesting such extensions. This included an individual extension based on this request. DOE prepared notifications understanding the digital limitations that Tribal communities often face. To be mindful of such limitations, the Department focused a lot of its efforts placing advertisements in Tribal community newspapers and newsletters. Unfortunately, most newspapers were identified as having monthly postings as opposed to weekly or bi-weekly, so some of them were published very close to the date of the meetings. To accommodate this, DOE also published Tribal Listening Session advertisements in public newspapers surrounding Tribal communities. These distributors were typically state-wide distributors and had faster publication schedules to help get information out earlier. We apologize that your community did not receive this notice earlier. Please know that we are taking your feedback seriously and making a plan going forward to take into consideration different and more accessible mechanisms when notifying not only Tribal governments, but also Tribal communities. Please see Section 1.31. of the EIS for additional information on public outreach.

because, again -- well, especially here at Santa Clara, our Tribal Internet service is just pitiful. It's in and out. And -- and my fellow seniors are -- most of them don't have Internet still. So it's -- it's not really -- the word's not getting out there. So how can people, especially Native people, react to this situation?

I mean, obviously, everyone -- you guys have all been working on this for several years, I would imagine. But we're just learning about it now. And I'm just overwhelmed with the information. So I'm going to -- I personally am going to have to sort out a lot of -- a lot of this information.

But I already know what's gone on in New Mexico. And I agree to that. All the trailings -- or the tailings that are left by the mines in -- near Acoma, I don't think you'd want that in your backyard. So the impact on -- on Native communities really needs to be taken into consideration. So I wholeheartedly support the extension of the response time. And I'll leave it at that. Thank you.

MS. LOWE: Thank you, Ms. Lonewolf.

Laura, you've got your hand up again, I think.

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121-2 DOE made a good-faith effort to communicate with Tribes and environmental justice communities to inform them about the project and inform them of methods to participate in the EIS process. See response to Comment 056-3, which addresses DOE's public outreach efforts. DOE acknowledges the occurrence of legacy contamination that has occurred from past uranium recovery and enrichment activities and your concerns. Please see Section 2.4, "Legacy Issues," of the CRD for additional information about existing mine and mill tailings. Please also refer to Section 3.1, "Uranium Mining and Milling," in Vol. 1 of the Final EIS and 1.3, "Affected Environment and Environmental Consequences," of the Technical Report for further information on potential mining and milling impacts by resource.

121-3 An individual comment extension was granted based on this request.

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MS. WATCHEMPINO: Thank you. I'm sorry. I have to look at my notes because this is such an extensive draft environmental impact statement, which even I myself have not been able to fully review. But the transportation -- the transportation of HALEU is -- or transportation impacts involved at each step of this process that were outlined in our presentation, those impacts are not small. They are hugely carbon intensive. And I -- that needs to be noted. And the carbon impacts of transportation noted, as well as the radioactive emissions that will be occurring.

As we know, radiation impacts are cumulative within the body. So what might be considered small has to also be considered in conjunction with other exposures; for example, those of us that live near uranium mining sites. That is a huge impact, to add an additional uranium radiation exposure from transportation. So the transportation analysis really needs to be beefed up and consider all -- all of this: the fact that radiation impacts are cumulative in the human body and that no -- there is no safe level of radiation. That is pretty much acknowledged by all the world's scientists. And -- and to say that transportation impacts are small

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122-1 GHG emissions associated with all aspects, including transportation, of the Proposed Action were addressed in the HALEU EIS. The GHG emissions are summarized in Section 2.7.1.3, "Global Cumulative Effects," and Section 4.3.2, "Greenhouse Gases and Climate Change." These sections also include a comparison to the potential reduction in GHG emissions associated with the use of HALEU in advanced reactors.

122-2 DOE acknowledges commenter's concern that the radiation impacts are cumulative within the body. This includes the cumulative effects of background radiation that the general population is exposed to every year. The average individual in the United States annually receives about 625 millirem of radiation dose from all background sources, of which about half (e.g., about 300 millirem) is received from natural background sources such as cosmic and terrestrial radiation and radon gas in homes. (National Council on Radiation Protection and Measurements, 1993). Table 4.2-1 of the EIS summarizes cumulative transportation impacts. This table provides the expected total impacts, in terms of total doses received by workers (truck drivers) and general population, from transports of various forms of uranium materials for an annual production of 50 MT of HALEU. The population doses include both the exposures from incident-free operation and potential accident conditions during transports. To get a better perspective of the cumulative transportation risk, the analysis included risks from historical shipments, general radioactive materials transportation that was not related to any particular action, and reasonably foreseeable actions. As shown in Table 4.2-1, the transportation impacts from the Proposed Action are expected to be SMALL and would not substantially contribute to cumulative impacts. See Section 2.6, "Transportation," for additional information.

without considering this is -- it's not true. It's not true, and it's misleading.

Thank you. I'm sure I'll think of something else, but I'll stop for now.

MS. LOWE: Thank you, Ms. Watchempino. Well, I think we'll start the five-minute clock. Oh, we got a hand up. I'm sorry.

Leona Morgan, would you like to speak again?

MS. MORGAN: Okay. Yeah. I just wanted to add that the whole proposal to increase uranium production, whether HALEU or any nuclear anything, it's a total violation of the federal trust responsibility to not just Indigenous -- not just federally recognized Tribes, but all Indigenous peoples. So the federal government is supposed to protect us, I guess. I mean, that's -- that's what this trust responsibility is about. And if -- if it's truly in the United States' responsibility to -- to do, you know, take action that is going to protect us as Tribes or Tribal members, HALEU will -- HALEU is in direct violation of that. Just because the -- the occurrence of uranium mining is most often on Indigenous lands, which impacts our water, our land, resulting in health problems and the myriad of issues

122-2 (cont'd)

123-1

123-2

123-1 DOE contacted all federally recognized Tribes through formal letters and hosted three Tribal Listening Sessions to determine Tribal concerns about the Proposed Action. Additional notifications were also sent via Tribal newspapers/newsletters, email notifications, and social media to solicit Tribal input throughout the comment period. At this time, DOE has received two government-to-government consultation requests from the Morongo Band of Mission Indians and from the Agua Caliente Band of Cahuilla Indians. Please see Section 6.1, "Consultations," of the Final EIS for additional information about Tribal consultation. DOE remains open to additional government-to-government consultation requests. As noted previously, DOE is not making decisions regarding specific facilities or activities and therefore is not pursuing activities that are ripe for Section 106 Consultation. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental and Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies, when appropriate. In the meantime, DOE continues to encourage Tribal participation and remains available for government-to-government consultations consistent with our trust responsibilities.

123-2 DOE made a good-faith effort to communicate with Tribes and environmental justice communities to inform them about the project and inform them of methods to participate in the EIS process. See response to Comment 056-3, which addresses DOE's public outreach efforts. DOE acknowledges the occurrence of legacy contamination that has occurred from past uranium recovery and enrichment activities and your concerns. Please see Section 2.4, "Legacy Issues," of the CRD for additional information about this issue. Please also refer to Section 3.1, "Uranium Mining and Milling," in Vol. 1 of the Final EIS and 1.3, "Affected Environment and Environmental Consequences," of the Technical Report for further information on potential mining and milling impacts by resource.

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that we have in Indian country due to uranium mining and milling.

And so, because of all of those problems -- and then, now, we're going to lose RECA. So if we don't have any -- I know that has -- that's not on your plate, but the Radiation Exposure Compensation Act is set to sunset in June. And so without -- without these things in place for Tribes, we have no protection against uranium mining impacts. Because if we don't have RECA, how are people going to get compensation for impacts from HALEU or other things that are coming down the road?

So because we don't have -- because we're going to lose RECA, because there's no funding to clean up mines, because there's no direct support for Indigenous nations impacted by uranium mining -- above and beyond what is happening on Navajo, for all Indigenous nations -- this is -- this is also an EJ issue. So I think all of these things, the DOE and other agencies have not considered just, you know, the -- the trust responsibility as well as an EJ screening and all of those other impacts to Indigenous nations and -- and communities where these facilities already exist. Because we're already overburdened, especially if you're talking about brownfields and

123-2 (cont'd)

123-3

123-4

123-3 DOE acknowledges your concerns regarding the clean-up of former uranium mine sites and the Radiation Exposure Compensation Act (RECA) although RECA and legacy issues are outside the scope of the HALEU EIS. Please reference Section 2.4, "Legacy Issues," of this CRD for more information.

123-4 In the EIS, DOE has acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues. Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. Unrelated to the Proposed Action but related to various concerns about legacy issues, DOE's Office of Legacy Management (https://www.energy.gov/lm/office-legacy-management) was established to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the environment. In addressing its mission, the Office of Legacy Management functions to protect human health and the environment through effective and efficient long-term surveillance and maintenance; preserve, protect and make accessible legacy records and information; support an effective and efficient workforce structured to accomplish departmental missions; implement departmental policy concerning continuity of worker pension and medical benefits; manage legacy land and assets, emphasizing safety, reuse, and disposition; mitigate community impacts resulting from the cleanup of legacy waste and changing departmental missions; actively act as liaison and coordinate all policy issues with appropriate departmental organizations. The efforts associated with the Proposed Action are independent of the efforts to address legacy issues. Any action DOE takes to implement the Proposed Action would not impact the efforts DOE or other regulatory bodies are taking to address legacy issues associated with defense and commercial uranium production.

The Final EIS has been updated to clearly indicate environmental justice impacts (in Vol. 1 Sections 3.1.11 and 3.3.8; Vol. 2 Sections A.1.3.11 and A.3.3.7) and outreach discussions (in Sections 1.2 and 1.3). The environmental justice impacts were evaluated to the extent practicable based on existing analysis for sites, and surrogates for others, to allow SMEs to predict the potential impacts of the Proposed Action. In addition, links are provided throughout these sections to the appropriate portions of Appendix A and the referenced Technical Report (Leidos, 2023) for the detailed analysis. In addition, DOE used an environmental

stuff like that. That's just adding more environmental injustice, which is going to basically kill us. So, I mean, in essence, I think your trust responsibility is to protect us, not to kill us by increasing the amounts of radiation and contamination that will happen if these things are increased because of increased HALEU production. So that's all I wanted to add. Thank you.

MS. LOWE: Thank you, Ms. Morgan. I'll turn on the clock. The clock is not to intimidate. It's just to sort of let you know we're willing to wait. So we're happy to receive any more comments that you want to make tonight.

Laura had her hand up again. Laura Watchempino?

MS. WATCHEMPINO: Thank you. In closing, I'd just like to reiterate that a moratorium on new uranium production is needed until all uranium mining and milling sites in the United States have been cleaned up or returned as best they can be to pre-mining conditions. These uranium sites are located within our watersheds and our Tribal homelands.

And also, I would like to emphasize that the Department of Energy needs to identify

123-4 (cont'd)

124-1

124-2

justice screening tool it developed to comply with EO 14008, *Tackling the Climate Crisis at Home and Abroad* and DOE's adoption of the Justice40 Initiative. DOE identified disadvantaged communities in the United States, considering a census tract that ranks in or above the 80th percentile of the cumulative sum of 36 burden indicators for a state and has at least 30% of the households identified as low-income populations as a disadvantaged community. DOE considered disadvantaged communities to include low income, high unemployment and underemployment, racial and ethnic residential segregation, linguistic isolation, high housing cost burdens, distressed neighborhoods, high transportation cost burden and/or low transportation access, disproportionate environmental stressor burden and high cumulative impacts, limited water and sanitation access and affordability, disproportionate impacts from climate change, high energy cost burden and low energy access, jobs lost through the energy transition, and access to healthcare.

Site-specific locations are not being analyzed in this EIS. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies. In the meantime, DOE continues to encourage Tribal participation and remains available for government-to-government consultations consistent with our trust responsibilities.

124-1 DOE acknowledges the comment's request for a moratorium on uranium production. However, in the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Please see Sections 2.1, "Support and Opposition"; 2.2, "Purpose and Need"; and 2.4, "Legacy Issues," in the CRD for additional information.

disposal sites for spent commercial nuclear fuel. The Department of Energy has not done its homework. That needs to be done before a proposal like this is considered or even more uranium mining is even considered because of the impacts -- the disparate impacts on communities that have lived with them for over half a century. And that's a matter of environmental justice. That needs to occur before the Department of Energy extends its reach into new ventures.

They're risky ventures. They're -- they're really a waste of our taxpayer money. And there are so many more things that should be taken care of, such as compensating uranium miners and millers that, you know, worked in these sites and sacrificed their health and, many times, their lives over a period of time to produce this mineral for the United States to produce nuclear weapons. And they should be compensated. And that's another area that really should happen before we even consider new proposals. And the mining and milling sites need to be cleaned up.

I'm sorry. My phone is telling me something.

So in closing, I just emphasize the

124-2 (cont'd)

124-3

124-4

124-2 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

matter of equity for Tribal communities and for impacted communities around the United States that have been devastated by uranium mining and milling and say that's why we need a moratorium on new uranium production, whether it's for enriched uranium or to be converted or deconverted into another material. Thank you.

MS. LOWE: Thank you, Ms. Watchempino. Okay. Start the clock.

Okay. Jesse Deer In Water.

MR. DEER IN WATER: Yeah. I was wondering, like, the address -- this is actually kind of just a question before I give my last comment thing. What's the address to submit comments digitally? Is that in the e-mail, or will that be sent out?

MS. LOWE: The next slide up, the closing slide.

MR. DEER IN WATER: Okay.

MS. LOWE: Can you read --

MR. DEER IN WATER: Yeah. Actually, yeah. Yeah. Now I can.

MS. LOWE: There you go. Okay.

MR. DEER IN WATER: All right. Yeah. No. Just before I go, I just wanted to reiterate the

124-5

125-1

124-3 Environmental justice is discussed in multiple sections of Chapter 3, *Impacts* (e.g., Sections 3.1.11 and 3.3.8), and new sections were added to Volume 2 (Sections A.1.3.11 and A.3.3.7). These sections provide information on communities with environmental justice concerns based on select locations of current facilities, reviewing past NEPA documents, and updating U.S. Census data for block groups, cities, counties, and states. With no specific sites identified, environmental justice analysis varied according to the type of activity (e.g., mining and milling, enrichment, etc.) and the available information from existing NEPA documents. Environmental justice impacts were considered to the extent possible given that there are no specific site locations for the HALEU fuel cycle activities (and the ROD will not specify specific sites). For further information about the EJ analysis and updates in this FEIS, please see DOE's response to Comments 056-13 and 056-28. To determine cumulative burdens, DOE's Energy Justice Mapping Tool – Disadvantaged Communities Reporter was also used to identify areas considered disadvantaged.

In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues. Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. Unrelated to the Proposed Action, DOE's Office of Legacy Management (https://www.energy.gov/lm/office-legacy-management) was established to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the environment. In addressing its mission, the Office of Legacy Management functions to protect human health and the environment through effective and efficient long-term surveillance and maintenance; preserve, protect and make accessible legacy records and information; support an effective and efficient workforce structured to accomplish departmental missions; implement departmental policy concerning continuity of worker pension and medical benefits; manage legacy land and assets, emphasizing safety, reuse, and disposition; mitigate community impacts resulting from the cleanup of legacy waste and changing departmental missions; actively act as liaison and coordinate all policy issues with appropriate departmental organizations. The efforts associated with the Proposed Action are independent of the efforts to address legacy issues. Any action DOE takes to implement the Proposed Action

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would not impact the efforts DOE or other regulatory bodies are taking to address legacy issues associated with defense and commercial uranium production. Please also reference Section 2.4, "Legacy Issues," of this CRD for more information.

Please also see Section 1.3.1 of the EIS for information regarding DOE's public outreach, including to Tribes.

124-4 DOE acknowledges your concerns regarding worker compensation and clean-up of former uranium mine sites, although legacy issues are outside the scope of the HALEU EIS. Please reference Section 2.4, "Legacy Issues," of this CRD for more information. Please also see Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of the CRD for additional information about funding.

124-5 Please see the response to Comment 124-1.

125-1 The digital comment submission mechanism was to submit a comment via email to HALEU-EIS@nuclear.energy.gov. This question was answered for the commenter during the Tribal Listening Session.

need for an extension on the comment period. I don't really know how -- how the -- how that stuff -- how that works. But especially, in order for our -- our folks here -- and all the folks, it sounds like.

You know, like I had mentioned in the thing that I second this part about Tribe -- you know what I mean? Like, it's -- it's easy to say, "Yeah; I notified someone for something." But if, like, you have a council, you have committees, you have process for even deciding if you're going to comment on something, if there's a need to, then let alone the process of developing the comment and researching the materials. And then you have the submission of the comment and the process of that itself. Like, you all can see how some stuff sits in the House and the Senate on the government for years sometimes before it gets any attention. You can't expect a Tribal government with less capacity to move faster than the United States itself.

And so, I would say definitely more proper engagement through the different channels. It usually just goes to one department when you guys send these out, which, you know, sometimes is staffed with only one person who may or may not care about this issue. And just because they may or may not care

125-2

125-2 Individual comment extensions were granted to Tribal members requesting such extensions. An individual extension was granted based on this request. DOE did not receive similar comment period extension requests from environmental justice communities. Thank you for sharing this perspective. The Tribal Listening Sessions were specifically implemented to listen to Tribal perspectives so DOE can more meaningfully consider Tribal concerns and engage with Tribes. Going forward the Office of Nuclear Energy will take into consideration different and more accessible mechanisms when notifying not only Tribal governments, but also Tribal communities and environmental justice communities. Please see Section 1.3.1 of the EIS for additional information about public outreach.

about it or have the need or want to forward it or press the issue as something important -- yeah. I would just say the process here is a real issue in general, especially with communities of color and cultural communities, not just Natives, you know.

So -- so yeah. I would say, you all, take this into consideration, especially along the lines of environmental justice. And also consider the path of no action. But I have to run. I have kids and family and stuff down here waiting on me. So thank you.

MS. LOWE: Thank you, Mr. Deer In Water.

Leona Morgan, you have your hand up again.

MS. MORGAN: Yeah. Thanks. So just going back to what Jesse is saying about process, I know NRC has attempted to translate nuclear proposals into our language. I mean, there's -- there's a lot of considerations the DOE should make when -- when asking for comments from Indigenous nations. There's the language barrier, the capacity issue.

And I also wanted to comment on the one meeting in Chandler, which doesn't make any sense to me. There's known border cities, border towns --

125-2 (cont'd)

125-3

125-3 DOE acknowledges your preference for the No Action Alternative. DOE reiterates the Council on Environmental Quality (CEQ) statement: "Commenting is not a form of 'voting' on an alternative" (CEQ 2021). The number of comments received for or against a particular alternative does not dictate the action that a Federal agency must take.

126-1

126-1 Thank you for sharing these perspectives. In the future, DOE may consider translations services for its documents and notifications materials. Unfortunately, without site-specific information, DOE did not have the capacity to effectively translate all materials into the different languages of Tribal communities across the nation. In our messaging, however, we did offer language accommodations upon request, which we did not receive. The in-person meeting in Chandler, Arizona, was held in cooperation with an existing Tribal conference with national Tribal attendance. The intention of hosting our meeting there was to bolster Tribal attendance without asking Tribal communities to travel solely for DOE's event. Language translation services were not requested for that event. DOE also offered two virtual Tribal Listening Sessions to accommodate those who could not travel to the in-person meeting. Please see Section 1.3.1 of the EIS for additional information about public outreach.

let's say, like Gallup or Rapid City -- or places where -- I mean, even Albuquerque -- where there's a lot of Indigenous nations close by who are interested in these kinds of issues. Chandler, to get there is so inaccessible. I mean, it's so -- it's far from the airport. We would have to get -- I would have to pay for travel, a hotel. I mean, obviously, Tribal governments would have to get this all approved if they were planning to go to this one meeting.

So, in addition to an extension of the comment period, I'd like to request the DOE add additional mechanisms for Tribes. And a mechanism that's culturally appropriate and accessible to Tribal government employees as well as the members living in places that will be most impacted. 'Cause I don't think you're going to get a lot of people showing up to Chandler. And I don't know of the Arizona Tribes, how many of them are aware and ready with their comments. But yeah. It's -- it's inaccessible. And when you're there, I'm not sure how many translators you will have. But that's also -- those are also things to consider, is -- is to be prepared for -- for different cultural protocol wherever you're going. And I would say to have multiple meetings across the country, not just one in a -- in a place that's also

126-1 (cont'd)

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expensive to travel to. Thank you.

MS. LOWE: Thank you, Ms. Morgan. Let's see if there's any hands going up. Start the clock. Oh, you did. Thanks.

Laura Watchempino?

MS. WATCHEMPINO: Yes. I wanted to also mention the commercial viability of this HALEU proposal. I don't think we even know -- I mean, since the advanced reactors haven't even been constructed yet, do we even know what is the commercial viability of the energy they produce? I mean, will it be marketable? Will it be competitive with other less expensive alternatives? I think that analysis should have been included in the draft EIS. And it's -- it's essential. Because this could just be a lot of expensive pre-planning that just is not going to make it to reality to be actually a viable source of energy for the future.

MS. LOWE: Thank you, Ms. Watchempino.

MS. WATCHEMPINO: Thank you.

MS. LOWE: Leona's hand is up again.

MS. MORGAN: Yeah. One last comment. Just thanks to Laura for reminding me. And I didn't hear anyone talk about climate.

I know Biden -- Biden had promised or

126-1 (cont'd)

127-1

128-1

127-1 Please see response to Comment 056-9 related to the development of the purpose and need statement. Please also see Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of this CRD for additional information about the purpose and need. Commercialization of the HALEU fuel cycle provides incentive for companies to invest in the development of HALEU fuel production capabilities which in turn would provide advanced reactor developers with the surety that fuel would be available for their reactor designs. Commercial viability and comparing the cost of energy from advanced nuclear reactors to the cost of energy from alternative energy sources is out of scope for this HALEU EIS. Please see Section 2.8, "Out of Scope," of this CRD for additional information.

128-1 Thank you for your comment. The HALEU EIS does not claim that nuclear power is carbon free. Conversely, Section 4.3.2 of the HALEU EIS provides an estimate of GHG (carbon) emissions that could occur from the cumulative Proposed Action activities and the post-Proposed Action activities of reactor operations and fuel fabrication. Further, a new detailed section on GHG emissions calculations, including Tables

committed to triple nuclear energy development by 2050. And regardless if HALEU ever happens, that promise by Biden to -- to triple nuclear power is -- it's -- it's a non-solution to climate change because nuclear energy is not going to solve the climate crisis. It's not measured properly. We -- I think -- I don't know if people on the phone know this, but just to submit for the record, the Intergovernmental Panel on Climate Change incorrectly calculates the carbon footprint of nuclear by ignoring the entire front end and the entire back end, which is the storage of high-level radioactive waste forever. So if you just don't count the carbon footprint of forever, anything looks like it's carbon-free.

So nuclear energy, to be -- for the DOE or the United States to push nuclear energy as -- as safe or a new energy source to help us with climate change, they need to count the entire impact of the whole uranium fuel cycle -- the fuel chain, not the fuel cycle. Because when it starts and when it ends, there's waste created at every level. And to manage that waste, all of the carbon footprint from all of that -- the -- the startup of mining and all the reactors and decommissioning of everything -- we need to consider the true cost to our climate from nuclear.

128-1 (cont'd)

A-12 through A-15, has been added to the Final EIS as Volume 2, Section A.8. Regarding the storage of spent nuclear fuel, Sections 4.5 and 5.5 of the *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (NRC, 2014) determined that the contribution of storage of spent nuclear fuel to GHG emission levels would be small. This document is incorporated by reference in the HALEU EIS section 3.7.3.

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Nuclear is not going to solve the climate crisis, is all I wanted to say. Thank you.

MS. LOWE: Thank you again. Start the clock. That's two and a half minutes. We'll give you two and a half more minutes to see -- we just want to make sure everybody has an opportunity to provide their comments for the record.

Okay. We have officially reached the end of this Tribal listening session. On behalf of the U.S. Department of Energy, I would like to express our gratitude for your participation in the process for the high-level -- excuse me -- high-assay low-enriched uranium environmental impact statement. As a reminder, there will be another listening session tomorrow evening starting at nine o'clock p.m. Eastern. And you can register to participate in that the same way that you registered to participate this evening.

DOE will continue accepting comments via mail and e-mail through April 22, 2024. Written comments will be accepted. They can be sent to Mr. James Lovejoy, who is DOE's EIS document manager, by mail to the Department of Energy's Idaho Operations Office, 1955 Fremont Avenue, mail stop 1235, located in Idaho Falls, Idaho, at 83415. The e-mail address

128-1 (cont'd)

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for submitting comments is HALEU -- H-A-L-E-U -- hyphen EIS at nuclear.energy.gov. And those same addresses may be used to request to be added to the mailing list for project notifications and to request government-to-government consultation. Again, DOE welcomes the government-to-government consultation requests. So they're looking forward to getting those.

More information, including the presentation slides that were shared by Mr. Reim this evening, will be available on the project website at https://www.energy.gov/ne/haleu-environmental-impact-statement.

Let the record reflect that it is now 8:21 p.m., and we will adjourn this listening session. Thank you so much for participating tonight. Your input is very much appreciated.

(Whereupon, the meeting concluded at 8:21 p.m.)

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CERTIFICATE

I, ALLISON DIERCKS, the officer before whom the foregoing proceedings were taken, do hereby certify that any witness(es) in the foregoing proceedings, prior to testifying, were duly sworn; that the proceedings were recorded by me and thereafter reduced to typewriting by a qualified transcriptionist; that said digital audio recording of said proceedings are a true and accurate record to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or othe

Allison C. Diercks

outcome of this action.

ALLISON DIERCKS
Notary Public in and for the
Commonwealth of Virginia

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CERTIFICATE OF TRANSCRIBER

I, REBECCA BOELZNER, do hereby certify that this transcript was prepared from the digital audio recording of the foregoing proceeding, that said transcript is a true and accurate record of the proceedings to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

REBECCA BOELZNER

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

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VERITEXT LEGAL SOLUTIONS

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Comments from the Draft HALEU EIS Virtual Tribal Listening Session 2

Westfields Marriott Washington Dulles Hotel, 14750 Conference Center Drive, Madison Room, Chantilly, VA, April 11, 2024, 9PM

Tribal Listening Session for the Draft
Environmental Impact Statement for
Department of Energy Activities in Support
of Commercial Production of High-Assay
Low-Enriched Uranium (HALEU)

Moderated by Wendy Green Lowe
Thursday, April 11, 2024
9:00 p.m. EDT

Westfields Marriott Washington Dulles Hotel
14750 Conference Center Drive
Madison Room
Chantilly, VA, US, 20151

Reported by: Allison Diercks
JOB NO.: 6489802

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A P P E A R A N C E S

List of Attendees:

Wendy Green Lowe
P-2 Solutions
Tribal Listening Sessions Facilitator

Michael Reim
Program Manager
U.S. Department of Energy
Office of Nuclear Energy
Office of Advance Fuels Technologies

Dr. Jon Carmack
U.S. Department of Energy
Deputy Assistant Secretary for Nuclear Fuel Cycle and Supply Chain

Jason Anderson
U.S. Department of Energy
National Environmental Policy Act Compliance Office

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P R O C E E D I N G S

MS. LOWE: Good evening, everyone, and thank you for joining us for the virtual Tribal Listening Session. We're going to give it a minute or two to collect people, and we'll start in just a couple minutes.

Good evening, everyone, and thank you for joining us for this virtual Tribal Listening Session. My name is Wendy Lowe, and I will be facilitating this evening's session. I'd like to welcome you to this listening session on behalf of the U.S. Department of Energy's Office of Nuclear Energy. In compliance with the National Environmental Policy Act, the Department of Energy, also referred to as DOE, has published a draft Environmental Impact Statement, which analyzes the impacts of DOE's proposed action to acquire high-assay low-enriched uranium, or HALEU, for commercial use and demonstration projects and to facilitate the domestic commercialization of HALEU production.

Along with the representatives from DOE who are here with me this evening, we want to welcome

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you and express our gratitude for your participation in this listening session. We appreciate your taking the time to be with us here and providing your thoughts. We also want to thank those who have already provided us with valuable feedback.

In the first portion of this listening session, DOE's program manager for the HALEU program will give a short presentation on the draft Environmental Impact Statement. During the second portion, you will have an opportunity to ask questions about the HALEU program and the EIS. And in the third portion, you'll be invited to submit formal comments on the draft Environmental Impact Statement.

All comments, including those that are submitted during this listening session, comments submitted at other sessions, and any submitted in writing before April 22, 2024, will be considered by the Department of Energy. All comments received will help DOE refine its analysis, identify new information, and consider additional alternatives during development of the final Environmental Impact Statement.

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Before we start the information portion of today's listening session, I would like to emphasize that this meeting is closed to the press and the public. If anyone has joined this Zoom meeting who is not associated with the Tribe, or a federal agency, I would respectfully ask that you leave this Zoom meeting. Public resources about the program are available to you on the project website, which is posted in the chat for your convenience. Thank you for your understanding and cooperation.

Today is Thursday, April 11, 2024. The time is now 9:04 p.m. Eastern. This virtual Tribal Listening Session is the second of two that are being held this week. The first listening session was held yesterday, on Wednesday, April 10th, at 6:00 p.m. Eastern.

The recordings for both virtual listening sessions will be combined into one file and uploaded to the project website within one week of this meeting. There will also be an in-person Tribal Listening Session next week, on Tuesday, April 16th, starting at 5:30 p.m. Mountain, in Chandler, Arizona.

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The information on upcoming listening sessions is available on the project website.

The presentation portion of this listening session will begin in just a moment, with a presentation by Department of Energy's Program Manager Michael Reim. The presentation will last approximately ten minutes, and will provide information about the HALEU program and the draft Environmental Impact Statement. For those of you who are calling in on an audio only device, I would invite you to go to the project website so you can see the uploaded version of the presentation slides. The project website is located at https://www.energy.gov/ne/HALEU-environmental-impact-statement. And that link is provided in the chat for those of you who are participating online with Zoom.

Following the presentation, I will explain the procedures for the question and answer portion of this listening session. I'd ask that you hold your questions until that portion of the meeting.

One final reminder before we begin. While we understand that these listening sessions are

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not the same as formal government-to-government consultation, the U.S. Department of Energy also welcomes government-to-government consultation requests on the High-Assay Low-Enriched Uranium Environmental Impact Statement. The mechanisms for submitting a government-to-government consultation request will be provided towards the end of this meeting.

With that, I'll call on Mr. Michael Reim, who is the program manager for the HALEU program, to begin his presentation.

MR. REIM: All right. Thank you, Wendy, and good evening everyone. Before I begin, I would just like to reiterate DOE's appreciation for your participation in tonight's presentation, and Q&A session and public comment period. We appreciate you taking the time this evening to join us.

As Wendy mentioned, I'm Mike Reim, a program manager for the DOE Department of Nuclear Energy, and tonight this is the Tribal Listening Session for the draft Environmental Impact Statement for Department of Energy activities in support of

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commercial production of high-assay low-enriched uranium, or HALEU.

I'm joined this evening as well by Dr. Jon Carmack, who is the deputy assistant secretary for nuclear fuel cycle and supply chain, and Jason Anderson, who is the NEPA compliance officer for this project, so NEPA being the National Environmental Policy Act. They'll be joining me for the Q&A shortly.

So first I wanted to give a brief preview of the presentation. So the first half of the presentation is primarily focused on background information related to HALEU, including a definition, why it's needed, the purpose, as well as a brief summary of the HALEU request for proposals, or RFPs.

The second half of the presentation will cover the National Environmental Policy Act, or NEPA, and specifically the Environmental Impact Statement, or EIS, which is the draft document we have out for public review right now. It will also cover the proposed action and alternatives, the approach to impact analysis, and the summary of potential impacts

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that we found.

So first, a definition of HALEU. So what is HALEU? By definition, it's uranium-enriched to between 5 weight percent and less than 20 weight percent U-235. Low-enriched uranium is uranium enriched up to 20 percent, and advanced reactors generally use enrichments higher than 5 percent and up to 20 percent. For the purposes of this EIS, our proposed action is to acquire HALEU enriched to at least 19.75 and less than 20 weight percent U-235, and to facilitate the establishment of commercial HALEU fuel production.

In the United States, HALEU is currently made in limited quantities by down blending highly enriched uranium down to HALEU levels. However, the main way to create HALEU would be through enrichment, which is also part of this EIS. In general, HALEU allows for smaller designs, longer life cores, increased fuel efficiency, less waste, and other technical and operational attributes that make advanced reactors beneficial.

So why is HALEU needed. The Department

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believes that a clean energy feature requires nuclear energy, and that also includes advanced reactors towards the goal of providing electricity for low-carbon electricity. Most advanced reactor designs require HALEU to achieve the technical attributes I mentioned in the previous slide and other operational efficiencies. However, HALEU is limited in its domestic supply currently, with the aforementioned down blending of HEU to create small quantities of HALEU really being the only domestic source right now.

The purpose of this EIS is to incentivize commercial domestic production of HALEU, and currently commercial nuclear fuel suppliers can't produce HALEU. This is largely due to market uncertainties and infrastructure gaps, and this poses a concern for the development, demonstration, and deployment of many advanced reactor technologies.

Before I move on, I also wanted to highlight on this slide -- so these are two examples of advanced reactors that use HALEU fuel, the Natrium reactor and the XE-100, respectively. These were the reactors chosen for the demonstration program by the

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Department. So to accommodate the gaps in the HALEU fuel supply and to meet the nation's net zero emission targets, the Energy Act of 2020 directs the Secretary of Energy to establish, carry out through NE's program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use.

Additionally, the recently enacted National Defense Authorization Act for fiscal year 2024 among other things seeks to expeditiously increase domestic production of HALEU to meet the needs of advanced nuclear reactor developers and the consortium established under the Energy Act.

Pursuant to these authorities, any initiated or procurement process with an enrichment request for proposals and a deconversion request for proposals, which were issued in January of this year and November of 2023, respectively, the RFPs are currently being evaluated by the Department. And because that procurement is ongoing, this EIS that we're talking about tonight is generic in the sense that it doesn't include site-specific information.

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If contracts are awarded under the RFPs, the awardees will be required to apply and obtain licenses and permits from the appropriate regulatory agencies, including the NRC, other federal agencies, or agreement states, and these regulatory agencies will be required to comply with all applicable NEPA requirements or state equivalents, and at that time DOE expects that site-specific environmental analysis would be conducted by the relevant regulatory agencies. And I'd also like to point out the RFPs are available -- are linked on our website with the links in the slides here.

So now I'm going to transition into the second half of the brief, to discuss the National Environmental Policy Act, specifically the HALEU EIS. So first, the proposed action. The proposed action is to acquire through the procurement from commercial sources HALEU enriched to at least 19.75 and less than 20 weight percent uranium 235 over a ten-year period of performance, and to facilitate the establishment of commercial HALEU fuel production. Given the variety of HALEU applications, the initial capability is

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intended to be flexible and be able to accommodate a number of things, including enrichments of U-235 greater than 5 and less than 20 weight percent, production of up to 290 metric tons of HALEU at multiple enrichment facilities, modular fuel cycle concepts that could accommodate future growth, and conversion of uranium hexafluoride to forms suitable for production of a variety of uranium fuels. So this could include oxides and metal.

So one thing you'll notice in general about this program is the flexibility in potential sites and potential facilities, and we took a very broad approach when analyzing all of these possible outcomes. And as mentioned before, we won't know the exact outcomes until the request for proposals are awarded.

The no action alternative is the status quo. So that would be -- so that is where DOE would not implement the proposed action, and development of a domestic commercial supply of HALEU would be left to industry or industry would remain reliant on foreign sources of HALEU, which is the current situation.

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So next I'm going to talk about the HALEU supply chain, and go through the steps in that supply chain. Specifically, pointing out what was analyzed in this draft EIS. So there are six activities associated with the proposed action that were analyzed. In addition, at the end of this slide I'll also speak to the reasonably foreseeable activities that we considered that could result from the implementation of the proposed action.

So we'll start with the beginning of the fuel cycle. So for uranium production this is where uranium ore is mined and processed to yellowcake. This could be from domestic or foreign sources, for the scope of this analysis. Then conversion is the step where yellowcake is converted chemically into uranium hexafluoride.

Enrichment is the next step, and this could occur in three steps at multiple locations, potentially. Again, this is kind of where flexibility comes back in to the proposal. But, options include enrichment to no more than 5 weight percent, enrichment to greater than 5 but less than 10 weight

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percent, and enrichment from less than 10 weight percent to less than 20 weight percent in an NRC Category II facility. So again, quite a few options.

The next step is deconversion. So this is where the uranium hexafluoride is chemically converted to uranium oxide metal or potentially other forms, again in an NRC -- Nuclear Regulatory Commission -- Category II facility. Additionally, storage also in an NRC Category II facility.

And finally, as I mentioned, there are reasonably foreseeable activities that could result from the implementation, and this includes fuel fabrication for a variety of fuel types, reactor operation -- either a demonstration and test reactors, power reactors, isotope production reactors -- and finally spent fuel storage and disposition.

As you'll also note, each of these steps includes transportation. So as material is moved between facilities or through the fuel cycle, depending on the exact locations, there will be transportation steps. And that was analyzed as well as part of the activities associated with the proposed

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action.

Okay. So now I'd like to talk about the approach to the impact analysis. One contributing factor to the environmental impacts is where the facilities are located. So, as I mentioned previously, we do not have exact facility locations identified, as that will be handled through the request for proposals that is currently in procurement.

However, fuel cycle facilities are subject -- sorry. However, DOE has evaluated the NEPA documentation with similar facilities. As identified in the previous slide, the six areas under consideration, we analyzed NEPA documentation from those types of facilities and used analogs such as low-enriched uranium fuel cycle facilities, as well as HALEU fuel cycle facilities, that currently exist, and the activities described in the proposed action are not unique. Extensive NEPA evaluation exists for the environmental consequences of similar activities, and that's what we leaned on heavily. That's what the SMEs leaned on heavily when doing this analysis.

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Since the proposed action to acquire HALEU from commercial sources court propose a range of location scenarios, those location scenarios include different options as well. So this is going to include the use of existing uranium fuel cycle facilities with modifications -- so that's the top bullet, or the top text.

This could also include construction and operation of a new facility at an existing or industrial site, also known as a brownfield site. And finally, this could include the construction and operation of a new facility at a previously undisturbed site, or a greenfield site.

To estimate the potential impacts associated with the proposed action, as I mentioned, we leverage previous NEPA documentation and impact assessments, and this also included the NRC's impact assessment categories. Potential modification, construction, and operation of HALEU fuel cycle facilities would be subject to NRC, other federal agency, and agreement site licensing and environmental review, such as NEPA review, and potentially other

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federal and state permitting.

Okay. So I will conclude by describing our summary of potential impacts that were reached following the analysis of the sites, as mentioned on the previous slide. But first, I'd like to read a couple of definitions for the levels of impact. And I would note that this EIS does adopt the NRC impact assessment categories from the NEPA documents that were used as the basis for this analysis.

So "small impacts" are defined as having environmental effects that are not detectable or are so minor that they neither destabilize nor noticeably alter any important attribute of the resource. "Moderate impacts" are defined as having environmental effects that are sufficient to alter noticeably, but not destabilize, important attributes to the resources. And finally, "large impacts" are defined as having environmental effects that are clearly noticeable and are sufficient to destabilize important attributes of the resource.

So for this EIS, for existing uranium fuel cycle facilities we determined that most impacts

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would be small. The greater potential for a large impact for existing facilities is associated with mining and milling. However, impact levels would be mine specific.

Impacts at other industrial or brownfield sites in our analysis generally range from small to moderate. There could be potentially large impacts in areas associated with site demographics and historic cultural or ecological resources. And finally, impacts at previously undeveloped or greenfield sites range from small to moderate. And there could be potentially larger impacts here than brownfield sites, and this is due to increased unknowns. With undisturbed sites, there could be characteristics pertaining to historic, cultural, and ecological resources.

So that concludes the informational portion of the presentation. I will hand it back to Wendy, and we'll have a Q&A session shortly. So feel free to ask follow-up questions about the presentation or other topics related to HALEU or the EIS. Thank you.

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MS. LOWE: Thank you, Mr. Reim. That concludes the presentation portion of this virtual listening session. Next we'll open the question and answer portion, and invite your questions about the high-assay low-enriched uranium program and the draft environmental impact statement.

Before we begin, I would like to note that questions and answers will not be formally included in the final EIS. So if you ask a question that you would like to be formally included in the EIS, you would need to frame it as a comment during the comment portion of this listening session, which will occur directly after the question and answer portion.

Additionally, I'd like to point out on the right-hand portion of this slide that provides the pathways to request government-to-government consultation. So if you're interested, you're welcome to record these addresses during the Q&A portion of the meeting. If you're unable to or forget, the addresses are also in the chat. And that will be repeated throughout this evening.

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So as previously mentioned in tonight's presentation, Michael Reim is joined by Jon Carmack and Jason Anderson, and they'll be answering your questions on behalf of the Office of Nuclear Energy.

So as the moderator it's my responsibility to make sure that everyone who is interested has the opportunity to ask questions. If you're interested in asking a question, you can let us know by using the "raise hand" function in Zoom. Zoom keeps track of people who raise their hands, in order, and will call on your in the same order if you have your hand raised.

If you're calling in by telephone, you can also raise your hand by dialing *9. Another option for asking questions would be to add them using Zoom's chat function. So we'll be taking questions both orally and in the chat. So as they come in we'll ask them.

With respect to the participants in this listening session, we would suggest that we hear from Tribal leaders first and then staff. When you're called on, please introduce yourself and your Tribal

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affiliation as you begin. We're not going to limit the amount of time that anyone has to speak, but just invite you to be considerate of others who may have a similar desire to ask questions.

When you're asking questions, sometimes you want to pause to think. And if that's the case, let us know when you're done thinking about your question, so I can know that it's time to move on.

The question and answer portion of this listening session will continue until there are no more raised hands or questions in the chat. And at that time I'm going to give you a five-minute warning, just to let everybody gather their thoughts and see if they have anything else they want to ask. Because when we move on to the comment portion, we will no longer be responsive to questions. So I just want to give you a little bit of time to think that through.

So with that, the question and answer portion will now begin. And we'll look forward to doing our best to answer your questions and hear your concerns. So as a reminder, please begin by stating your name and your Tribal affiliation.

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Should I point out how to raise your hand? Okay. If you're not familiar with Zoom, at the bottom of your screen there's three dots. And if you click on that, it will give you the option of raising your hand. So that's the mechanism for raising your hand. Again, you can put questions in the chat, if you'd prefer.

I just want to coax you that if you have any questions please ask now, because the DOE folks will not be responding during the comment portion of the meeting.

We have a question. Patrick Mills, you may unmute and ask your question.

MR. MURPHY: Hello. This is actually Mason Murphy with Patrick Mills, with the Confederated Tribes of the Umatilla Indian Reservation. And we had a couple questions. But the first question was is there any potential in this domestic HALEU process to develop recycling capacity, or is that at all the intent? Specifically with regard to spent nuclear fuels that are obviously in the interim status at many reactor sites.

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DR. CARMACK: So this is Jon Carmack. I'm the deputy assistant secretary for nuclear fuel cycle. Could you give me your name again? I got Patrick's name, but your name I was writing Patrick's name.

MR. MURPHY: Yeah. My name is Mason Murphy. I am CTUIR's energy and environmental science program manager.

DR. CARMACK: Got you. It's a great question, Mason, and the recycle of these fuels is beyond the scope of this EIS. And so it's not for consideration in the scope of the study that was done for this particular purpose. But we are very interested in the long-term capability of these types of fuels to be recycled. Because you're enriching to a higher assay, from the 5 percent that we know today to 19.75, we're very interested in the economics of sort of that breakeven point where you would offset the costs of enriching to this level with recycling and extracting the usable fissile content of the spent nuclear fuel.

So though it's not a part of the plan

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in this particular EIS and study, it is a very interesting topic for us as a long-term research and development activity in DOE.

MR. MURPHY: Got you. Thank you for that. I appreciate the answer. Another question that I had was, you know, our nearby site is the Hanford Nuclear Reservation and we still haven't been made whole from many of those existing nuclear impacts on several of our treaty rights, and so -- and those treaty resources. And so I'm kind of wondering how will DOE address those impacts moving forward with some of these types of -- kind of this development of a domestic HALEU supply chain, which would ultimately continue those impacts.

Is there an opportunity, potentially, for confidential mitigation agreements out of this NEPA process?

MR. ANDERSON: Thanks for that question, Mason. This is Jason Anderson, the NEPA compliance officer for the Office of Nuclear Energy. And I would say that overall we are -- we understand the legacy of impacts from previous fuel cycle

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efforts. As Mike stated in the presentation, we don't have specific facilities or locations to analyze as a part of this EIS. However, we also would like to point out that the regulators of those eventual fuel cycle facilities will perform environmental reviews at the time, you know, prior to licensing. So there will be additional opportunities, very likely, that local Tribal nations can voice concerns at that time.

And as far as programs to remedy legacy environmental impacts, that's a good question. We don't have any programs with respect to this EIS that has that particular mission, although we do have departments within the Department of Energy that -- for which, you know, their mission has -- I think you're aware near Hanford is the ongoing cleanup mission.

We have asked through the RFP procurement process for the applicants to provide a community action plan for which we should be getting information from those applicants that would, amongst other things, describe plans to address anticipated negative impacts on disadvantaged communities and

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Tribal nations of their planned actions to complete the acquisition. And also, we are asking for them, as part of the community benefits plan, to offer a list of benefits that they believe that project can offer to those local communities.

MR. MURPHY: That makes sense, and that definitely seems consistent with the implementation of those benefit plans. So look forward to engaging on that.

Does NE anticipate in this particular effort releasing any potential RFPs for further review of and/or communication of this programmatic EIS and/or any additional outreach or education?

DR. CARMACK: So Mason, this is Jon again. You mentioned RFPs -- additional RFPs. We do envision -- there are two RFPs that are currently on the street and under procurement action. We can't talk much about those particulars and details of those at this time, other than what's in, you know, the -- what's been released on the SAM website.

We do plan to have some additional funding opportunity announcements associated with

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developing capabilities in infrastructure, transportation capabilities, and what we refer to as "innovative R&D" opportunities in the HALEU space.

MR. MURPHY: Thank you for that answer. Just one more follow-up question to that.

DR. CARMACK: Go ahead.

MS. LOWE: You may muted yourself. Maybe you meant to.

MR. MURPHY: No, actually I think that will be all for now. I appreciate your time today. Thank you.

MS. LOWE: Thank you.

So inviting any questions that may be churning in your mind. Please, this is a great opportunity to ask questions. So --

MR. MURPHY: What does -- sorry about that. I should have raised my hand. But I'm just coming right back at it, because --

MS. LOWE: That's okay.

MR. MURPHY: -- nobody else is --

MS. LOWE: Go ahead.

MR. MURPHY: I guess I was kind of

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wondering if we provide comments to this EIS, how does NE plan to respond to those? Would it be through government-to-government consultation and then also within a response to the final record of decision? Or how would those work?

MR. ANDERSON: Yeah, thanks for that question as well. So we will respond to all comments received during the public comment periods and the listening sessions tonight during the comment session. We will respond to all of those in the final EIS, and we will provide individual responses to each comment.

In addition to that, if the Tribes would like to request consultation we're certainly open and willing to engage in that as well, separately and in addition to the comment responses in the final EIS.

MR. MURPHY: Great. Thank you for that.

MS. LOWE: Any more questions out there?

So in the interest of time we're going to go ahead and start the five-minute timer. This is

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not to intimidate anybody but just to make sure we're doing due diligence, holding ourselves accountable for giving you plenty of time to think of questions you want, so.

I see a hand up again. Patrick and Mason, you have a question? Are you muted?

MR. MURPHY: Sorry about that. Is there an anticipation of the extent to which this action may impact the existing spent nuclear fuel within the DOE complex?

DR. CARMACK: Hey, Mason, this is Jon again. We anticipate no direct impact on the current quantity -- well, the current holdings of spent nuclear fuel by DOE. Because this action is really intended to incentivize the development of a commercial supply and ultimately a commercial demand for HALEU, we would expect the generated spent nuclear fuel to be managed consistent with commercial practices.

MR. MURPHY: Okay. Yeah. So basically stored onsite, then?

DR. CARMACK: That is one of the

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options that a company could envision for its spent nuclear fuel. But I can't say that that's the only thing that I would expect in the future for advanced reactors.

MR. MURPHY: But you anticipate an alternative approach to that? And is there already one that's currently in use? Existing SNF.

DR. CARMACK: Yeah, the reasonable -- I mean, it's reasonable to expect that, you know, spent nuclear fuel is generated from reactors using this. And to the extent possible, we looked at those things under this EIS, but many of the details are not known at the time. And so it's really beyond sort of the scope of this EIS to look at all of those potential future spent nuclear fuel actions in detail.

MR. MURPHY: Okay. Got you. So this EIS doesn't really do kind of a full life cycle analysis of the action?

MR. ANDERSON: It analyzes at a high level our understanding that, you know, use of HALEU will result eventually in more spent nuclear fuel. But as far as a detailed analysis of, you know, how

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much and where and how it will be handled, that -- we just don't have those details yet to analyze.

MS. LOWE: Inviting any follow-up questions on that topic. We will restart the clock.

MR. MURPHY: Sorry about that. One more question.

MS. LOWE: Oh, good. Okay.

MR. MURPHY: So kind of curious how -- I assume this EIS process will continue on until you've got the RFPs and you continue to inform that process and have additional information. Because it seems like, obviously, you would have to generally have an idea of their processing capacity and many of those facts and figures to understand really what the environmental impacts of this overall action might have. Is that correct?

MR. ANDERSON: Thanks for that. That's a good question. We're not planning on analyzing the awardees' plans from those RFPs in this EIS. You know, the Record Of Decision that will follow the final EIS is not expected to decide on particular locations for which these activities will be

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conducted. We wanted to -- to make a good decision on our proposed action at the earliest time that we could, to inform these efforts going forward, and so we really -- we wanted to get this analysis and the public and the Tribal input into us at an early stage, so that we can determine what our path forward is.

Now, those site-specific activities, as I mentioned earlier, they will be evaluated by other regulatory agencies, you know, such as the NRC, and we fully expect them to do a site-specific environmental review. So our EIS informing our proposed action on the front side and the regulatory agencies' review of the specific locations gives us confidence that the environmental impacts throughout this process will be well-analyzed and communicated to the relevant communities.

MR. MURPHY: Okay. I understand. So this process basically is a blanket EIS for all of the work. And each of the individual sites do their environmental assessments or supplemental assessments to this EIS? Does that sound accurate?

MR. ANDERSON: So, yeah, we would

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characterize this as generic EIS for the most part. And the analysis that we have for all of these, you know, impact areas in the environment, we've really taken a conservative -- well, what we would call a "bounding approach" in that, you know, we look at, you know, what are the most impacts, you know, that we could possibly expect, you know, by resource area, such as air, water, you know, land use, cultural impacts, and use that as like a bounding analysis, if you will, that we expect the follow-on activities to follow under.

As far as specific following NEPA evaluations, you know, the other regulatory agencies, like I mentioned, they would perform their own environmental reviews. So it would be, as I envision it, you know, separate -- not underneath, so to speak, our EIS, but their own separate environmental reviews. And, you know, depending on the activity -- you know, whether, for example, new facilities are built or whether existing ones are used but, you know, modified, that would influence, I predict, the level of a NEPA review that would be undertaken at that time

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by those other agencies, whether that would be an environmental impact statement or environmental assessments, or so on.

So the exact, you know, NEPA documents that would come out, it's hard for us to predict how many and which specific documents they will be at this point.

MR. MURPHY: Got you. Thank you. I appreciate all of your time today.

MS. LOWE: We'll start the clock one more time. Again, this is not meant to be intimidating. It's just want to make sure that we're doing our best job of providing an opportunity for you to ask questions. Thank you for your patience, and hoping people have additional questions.

Okay. Last call for questions.

And seeing no hands, the time is now 9:54, and the question and answer portion of this listening session has officially concluded. We will now begin taking comments on the draft environmental impact statement.

So during this final portion of the

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listening session, we'll accept formal comments on the draft EIS. Michael Reim, Jon Carmack, and Jason Anderson are listening to your comments on behalf of the Department of Energy, but they are here to listen. They will not be responding to anything that's said during the comment portion of this listening session.

We also have someone who is transcribing each comment during this listening session, so if you're called on to speak we hope that you'll speak clearly into your microphone, to help make sure that we can accurately record your comments.

All comments will be given equal consideration, whether they're submitted orally or in writing. And all of the comments that are submitted during the comment period will be included in a comment response document. That comment response document will include all of DOE's responses to all of the comments that are received, and it will be included in the final environment impact statement.

Similar to the question and answer period, you can let us know you're interested in

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commenting by using the raise hand function in Zoom, or by dialing *9 if you're on the phone. Additionally, formal comments can be submitted through the chat function, and the chat will be saved at the end of the listening session, and those comments will be entered into the official project record.

As I suggested at the question and answer portion of this listening session, we'd like to hear from Tribal leaders first, followed by Tribal staff. And if you are called upon, please introduce yourself and your Tribal affiliation as you begin.

I'd like to stress that this third portion of the listening session we will not be responding to questions. So if you asked a question during the question and answer portion of the listening session that you would like to go on the record, we'd ask you to state it again or reframe it as a comment.

The formal comment portion of this listening session will continue until there's no more raised hands or comments submitted in the chat. Again, I'll use the five-minute warning to give people

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final time to think things through and see if they have anything they want to add. When there's no more comments, then we'll conclude the meeting.

One final request I'd make of you tonight. I know some of you may have strong opinions about DOE's proposal, and I hope that you'll share those opinions in a respectful manner. We're grateful that you've taken time out of your busy schedules to participate in this virtual listening session, and we're thankful all of the Tribal input that we will be receiving on the draft environmental impact statement.

So with that, we'll begin listening to your comments. Again, start by stating your name and your Tribal affiliation. If you want to pause to give yourself a few minutes to think, that's find. So let us know when you're finished with your comment.

So I'm not seeing any hands and I'm not seeing any chats. I did want to stress that this is not the end of the comment period. DOE will continue accepting comments via mail and email through April 22, 2024.

Oh, there goes a hand. So, if you want

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Comments from the Draft HALEU EIS Virtual Tribal Listening Session 2

Westfields Marriott Washington Dulles Hotel, 14750 Conference Center Drive, Madison Room, Chantilly, VA, April 11, 2024, 9PM

to open your mic.

MR. MURPHY: Sorry about that. Yeah, I figured I'd just wait for any potential Tribal leaders to speak first. Again, this is Mason Murphy with the Confederated Tribes of the Umatilla Indian Reservation. I am the energy and environmental science program manager. And I just have a couple things to say.

We anticipate that the development of a domestic HALEU production cycle may have impacts on all of the following resources, and we request that special emphasis be placed on the analysis of the impacts to one, water quality and resident and anadromous fish habitat; two, big game habitat; three, state and federally listed wildlife and plants; four, historic properties of religious and cultural significance as defined in the National Historic Preservation Act, including but not limited to visual and oral impacts; and five, all other cultural and historical resources.

Thank you.

MS. LOWE: Thank you, Mr. Murphy.

129-1

129-2

129-1 Thank you for your comment. The record of decision for this EIS will not result in the selection of specific locations or facilities; therefore, this EIS does not include site-specific analysis. However, if the Proposed Action is undertaken and contracts are awarded thereunder, the awardee(s) will be required to apply to and obtain licenses/permits from appropriate regulatory authorities (e.g., the NRC, other Federal agency, or Agreement States) and these regulatory agencies will be required to comply with applicable NEPA requirements or State equivalents. At that time, DOE expects that site-specific environmental analysis would be conducted by the relevant regulatory agency, and that each of the resource categories named (water quality and resident and anadromous fish habitat; big game habitat; state and federally listed wildlife and plants) will be analyzed and assessed specific to the proposed impact area, under NEPA.

129-2 The record of decision for this EIS will not result in the selection of specific sites; therefore, this EIS does not include site-specific analysis. However, if the Proposed Action is undertaken and contracts are awarded thereunder, the awardee(s) will be required to apply to and obtain licenses/permits from appropriate regulatory authorities (e.g., the NRC, other Federal agency, or Agreement States) and these regulatory agencies will be required to comply with applicable NEPA requirements or State equivalents. At that time, DOE expects that site-specific environmental analysis would be conducted by the relevant regulatory agency, and that cultural and historic resources will be analyzed and assessed specific to the proposed impact area.

While DOE understands and shares Tribal interests in preserving historic and cultural resources, DOE is not considering site-specific facility or activity locations at this time. Therefore, the activities described in the HALEU EIS are not ripe for meaningful Section 106 consultation. DOE expects that other Federal agencies will be involved in the authorization of the HALEU activities and will have obligations to comply with applicable environmental and Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies. Regardless of this limitation, DOE continues to encourage Tribal participation and remains available for government-to-government consultations consistent with its trust responsibilities. Additional information on consultation has been added to Section 6.1 of the EIS.

We'll start the five-minute timer here. Again, this is not meant to be intimidating. We just want to make sure that we're giving you plenty of time. So if you decide you want to provide a comment, please don't hesitate to raise your hand or drop it in the chat. Alternatively, if you want to spend more time thinking about it and send it in in writing, that's fine too.

We have officially reached the end of this Tribal listening session. On behalf of the U.S. Department of Energy, I would like to express our gratitude to you for your participation in the process for the High-Assay Low-Enriched Uranium Environmental Impact Statement.

Before we close, I'd like to emphasize that sharing your comments during this virtual listening session is only one of the ways that you can participate in the environmental impact statement process. You may also submit written comments by sending them via U.S. Mail or email. DOE will continue accepting comments via email and mail until April 22, 2024. Written comments on the draft EIS

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should be sent to Mr. James Lovejoy, who is DOE's EIS Document Manager. His address is U.S. Department of Energy, Idaho Operations Office, located at 1955 Fremont Avenue, Mail Stop 1235, in Idaho Falls, Idaho 83415.

If you prefer, you can also email them to haleu-eis@nuclear.energy.gov. Those same addresses may be used to request to be added to the mailing list for project notifications, and to request government-to-government consultation. Again, DOE welcomes requests for government-to-government consultation.

More information, including the presentation slides that were shared by Mr. Reim this evening, are available on the project website, which is located at https://www.energy.gov/ne/haleu-environmental-impact-statement.

Let the record reflect that it is now 10:11 p.m. Eastern, and we'll adjourn this listening session. Thank you so much for participating tonight. Your input is very much appreciated.

MR. REIM: This is Mike Reim, one final time. On behalf of Jon and Jason, and the Department

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of Energy, I'd just like to thank you one more time for participating in this public meeting. And we look forward to any additional comments you may have that you will submit as part of the EIS process. So thanks again, and have a good evening.

(Whereupon, the listening session adjourned at 10:11 p.m. EDT.)

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CERTIFICATE

I, ALLISON DIERCKS, the officer before whom the foregoing proceedings were taken, do hereby certify that any witness(es) in the foregoing proceedings, prior to testifying, were duly sworn; that the proceedings were recorded by me and thereafter reduced to typewriting by a qualified transcriptionist; that said digital audio recording of said proceedings are a true and accurate record to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

Allison C. Diercks

ALLISON DIERCKS
Notary Public in and for the
Commonwealth of Virginia

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CERTIFICATE OF TRANSCRIBER

I, JANE W. GILLIAM, do hereby certify that this transcript was prepared from the digital audio recording of the foregoing proceeding, that said transcript is a true and accurate record of the proceedings to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

JANE W. GILLIAM

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Comments from the Draft HALEU EIS In-Person Tribal Listening Session 3
Chandler, AZ, April 16, 2024, 5PM

IN RE:

IN-PERSON TRIBAL LISTENING SESSION

Chandler, Arizona
Tuesday, April 16, 2024
5:33 p.m.

Reported by:
WINDY PICARD
CSR No. 12879

Job No. 6500269

PAGES 1-44

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APPEARANCES:

MIRANDA LAWSON, LEIDOS, INC.
WENDY LOWE, DEPARTMENT OF ENERGY

DOUG OUTLAW, DEPARTMENT OF ENERGY

MICHAEL REIM, DEPARTMENT OF ENERGY

JOHN KROHN, DEPARTMENT OF ENERGY

JON CARMACK, DEPARTMENT OF ENERGY

JASON ANDERSON, DEPARTMENT OF ENERGY

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Chandler, Arizona, Tuesday, April 16, 2024
5:33 p.m.

INTRODUCTION

MS. LOWE: Okay. We'll go ahead and get started. Thank you for joining us for this in-person Tribal Listening Session.

My name is Wendy Lowe, and I'll be facilitating this evenings's session. I'd like to welcome you on behalf of the U.S. Department of Energy, Office of Nuclear Energy.

And we'd like to think our gracious hosts, the Gila River Indian Community, and all the indigenous peoples of this land for allowing us to host this listening session here at Wild Horse Pass Resort.

Are there any tribal officials in the room that would like to introduce themselves before we get started?

Okay. Okay. Did you want -- I'll bring the microphone to you.

MR. MCCABE: I was going to go out to eat, but I'm going to stay here for a while, at least 45 minutes, 'cause this is a pretty interesting topic for me.

MR. REIM: Can I ask you, are you --

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(inaudible.)

MR. MCCABE: My name is Thomas McCabe, and I'm with Gila Regional Healthcare Corporation.

And we do have a lot of uranium for sure. And they're still trying to cover some of them up, 'cause they were exposed.

And there's mining that's going to happen northwest of Flagstaff, by the canyon, so they'll be shipping the ores through the Navajo reservation to the landing.

So this is why this topic is important to me.

MS. LOWE: Okay. Thank you very much. We'll let the DOE folks introduce themselves as well.

MR. REIM: Good evening. I'm Michael Reim, Program Manager. I work for the Department of Energy, Office of Nuclear Energy.

MR. ANDERSON: Hi. I'm Jason Anderson. I'm the compliance officer.

MR. CARMACK: Good evening. My name is Jon Carmack. I'm the Deputy Assistant Secretary for the Office of Nuclear Fuel Cycle and the Office of Nuclear Energy and DOE.

My office is responsible for the execution of this particular program.

Mr. REIM: We also have the

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Deputy Chief of Staff for the -- (inaudible.)

THE REPORTER: I'm not hearing them well.

MR. REIM: Since we have limited attendees, I really -- I really wanted to start -- essentially, if you'll only stay for 5 or 10 minutes or so, I think we should start -- if you have any questions for us, we should start with that.

If you'd like us to continue with the meeting, we will begin with the presentation. But since it's really only a couple of people in the audience, I think you should dictate what you'd like to hear from us, so it's kind of up to you.

MS. LOWE: We want to make sure the court reporter can hear.

MR. MCCABE: I guess this is intended for power generation.

MR. REIM: Correct.

MR. MCCABE: And as far as I know, that's the main purpose with this project.

I was talking to the person back there, and he indicated that there's two places where that's actually being built -- or maybe not yet. So it looks like it's coming along.

But there's always the security issue with the uranium and then also safety. So I'm curious how much

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more safe it is.

And then -- because, you know, we have bad actors out there that may want to hack or -- or maybe even make an intent to sabotage in some way. So those are my concerns -- and also the transport of uranium through our -- our reservation.

And we have a quite a bit of issues with cancer with our people, and I'm one of them. I had cancer last year. I had my operation, and I'm doing well right now.

So based on that, there's all this issue with the -- the health effects, beyond the radiation that will be used.

So go ahead and start your presentation

MR. REIM: Yeah. We'll start the presentation now.

MS. LOWE: Okay. So in compliance with the National Environment Policy Act, the Department of Energy has published a draft Environmental Impact Statement which analyzes the -- analyzes the impacts of DOE's proposed action, and that proposed action is to acquire high-assay low enriched uranium, or HALEU, for commercial use and demonstration projects and to facilitate the domestic commercialization of HALEU production.

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So along with the representatives of DOE who are here with me this evening, we want to welcome you and express our gratitude to you for coming to this listening session.

We appreciate you taking time out of your busy schedules to be here, and we also want to thank people that have already provided feedback.

So this meeting has three portions. The first portion is a presentation about the Draft Environmental Impact Statement, and then the second portion, we wanted to provide an opportunity for you to ask questions about the HALEU program and the Environmental Impact Statement, and then the third portion, we'll invite your comments about the Draft EIS.

And all comments that are received included in this session as well as other sessions that DOE is hosting and those that are submitted in writing will be -- before April 22nd, 2024 will be considered by the Department of Energy, and that will help them refine their analysis, identify new information, and consider additional alternatives during the development of the Final Environment Impact Statement.

So for the record, today is Tuesday, April 16, 2024, and it is 5:39 p.m.

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Comments from the Draft HALEU EIS In-Person Tribal Listening Session 3
Chandler, AZ, April 16, 2024, 5PM

This is the Final Tribal Listening Session. We had two virtual listening sessions last week, one on Wednesday, April 10th, at 6:00 p.m. Eastern, one on Thursday, April 11th, at 9:00 p.m. Eastern.

Recordings of those two listening sessions will be available on the project website by the end of this week.

And the -- if you're unfamiliar with that website, the URL for it is https://www.energy.gov/ne/haleu, or H-a-l-e-u, -environmental-impact-statement.

So the presentation is going to begin in just a moment. It will be delivered by Department of Energy Program Manager for the HALEU program, Michael Reim, and it's going to be about 10 minutes long, and he'll tell you about the HALEU program and the Draft Environmental Impact Statement.

Then I'll tell you about the procedures for the question and answer portion of this session.

We do -- I want to make sure that we say out loud that, we recognize that a listening session is not the same thing as a formal government to government consultation.

And the U.S. Department of Energy welcomes government to government consultation requests for this

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program, for the high-assay low enriched uranium Environment Impact Statement.

And we'll share with you the mechanisms for requesting a consultation later in this meeting.

So with that, I'm going to invite Michael Reim to provide a presentation about the program and the EIS.

PRESENTATION

MR. REIM: There we go. Does this work? Can you hear me?

Okay. Yeah. I apologize. Actually, I thought you had said you had five minutes. So I wanted to make sure we could at least have a couple questions and answers. Yeah. 45 minutes. That's plenty of time to cover the background material.

So welcome. This is the Tribal Listening Session for the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low Enriched Uranium, or HALEU.

We've already done introductions, so I'll skip this slide.

And I'll briefly cover the overview of this

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presentation. The first half is focused on some definitions of HALEU, what is it, why do we need it, as well as mentioning the HALEU request for proposals.

The second half of the presentation will cover the National Environmental Policy Act, or NEPA, so specifically the activities covered under the HALEU Environmental Impact Statement, or EIS, as well as the approach to the impact analysis that was taken in writing this draft report and the -- the summary of potential impacts that were found upon completing that analysis.

So first and maybe most importantly is, what is HALEU? So HALEU is -- by definition, is defined as uranium enriched between 5.0 weight percent and less than 20.0 weight percent U-235.

For the purposes of the HALEU EIS, DOE's proposed action is to acquire HALEU enriched to at least 19.75 percent and less than 20 weight percent U-235 and to facilitate establishment of commercial HALEU fuel production.

I'll mention more about that in the second half of the presentation.

When it comes to enrichment levels, low enriched uranium is uranium enriched to up to and less than 20 percent U-235.

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Existing commercial power reactors in the United States generally use 5 percent enrichment, however, defense reactors that the department is -- is working on can use HALEU fuel up to and less than 20 percent.

In addition, highly enriched uranium is defined as uranium enriched to greater than 20 percent uranium or greater. And those applications are defense in nature, such as naval reactors.

And then you might be wondering, why are we using HALEU fuel, and why would we promote defense reactors?

There's a number of positive attributes they have, including smaller designs than current reactors, longer life, of course, increased fuel efficiency, less waste, and some other operational and technical attributes that are improvements over the current generation of reactors.

Finally, on this slide, I wanted to briefly touch on how HALEU is made. You can down blend highly enriched uranium down to HALEU levels, so small amounts are being made this way by using existing -- (inaudible) -- owned by the federal government.

However, for the most part, for the purposes of this EIS, the proposed action would include

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enrichment of uranium up to 19.75 and less than 20 percent U-235.

So next, I'll talk a little more about why HALEU is needed. The two reactors on the screen are examples of advanced reactors, so these are demonstration reactors that the department has selected.

And the first one is a natrium reactor, and the second is the XE-100. There's more information about these designs and many other advanced reactor designs on our website.

And I want to just talk about some of -- specifically about why HALEU is needed. So as mentioned, the most advanced reactor designs require HALEU to achieve some of the attributes I mentioned previously -- (inaudible.)

HALEU is only in limited quantities domestically, so gaps in supply could delay the deployment of advanced reactors, and this is a problem because we need to continue to deploy clean energy technology to support the net-zero emissions target by 2050. So that's a goal set by the government. So the Department of Energy supports advanced reactors in order to meet climate change goals.

And, finally, commercial nuclear fuel

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suppliers can't produce HALEU due to market uncertainties and infrastructure gaps. So, again, this poses a concern for the development of advanced reactors.

So to accommodate these gaps and meet the nations net-zero emissions target, the Energy Act of 2020 passed by congress directs the Secretary of Energy to establish and carry out, through the Office of Nuclear Energy, a program to support availability of HALEU for civilian domestic research, development, demonstration, and commercial use.

Further, the National Defense Authorization Act for fiscal year 2024 seeks to expeditiously increase the domestic production of HALEU to meet needs of advanced nuclear reactor developers and the consortium established in the Energy Act.

Finally, before we get into some more detail about the Environmental Impact Statement specifically, pursuant to the authorities on the previous slide, the Office of Nuclear Energy initiated a procurement process with an enrichment RFP and a deconversion RFP, which were issued in January of this year and November of last year, respectively.

The RFPs request proposals from commercial

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vendors regarding HALEU procurement and enrichment and deconversion services. DOE is currently in the process of evaluating the responses to those RFP's.

Because that procurement process is ongoing, this Environmental Impact Statement is generic in the sense that it does not include site specific information.

If contracts are awarded under the RFPs, the awardee will be required to apply and obtain licenses and permits from the appropriate regulatory authorities, including the Nuclear Regulatory Commission and other federal agencies or agreement states.

Those agencies will be required to comply with all applicable NEPA requirements or state equivalents. And at that time, DOE expects that site specific environmental analysis would be conducted by the relevant regulatory agency.

So the second half of the presentation, as I mentioned, is focused on the National Environmental Policy Act as well as the HALEU Environment Impact Statement, which is the draft document out for public comment right now.

And now is also, maybe, a good time -- I'm sure Jon caught you walking in. But we have printed

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copies of the full report and summary report in the back, so if you'd like to take a copy or take a couple copies, feel free.

So first, I'd like to read the proposed action verbatim, so the proposed action for this Environment Impact Statement.

And the proposed action is to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent urainium-235 over a 10-year period of performance and to facilitate the establishment of commercial HALEU fuel production.

Given the variety of HALEU applications, which is my upcoming slide, the initial capability is intended to be flexible and able to accommodate a number of things, including enrichment of uranium 235 to greater than 5 and less than 20 weight percent, production of up to 290 metric tons of HALEU, which this would occur at multiple enrichment facilities, modular HALEU fuel cycle facility design concepts, which would help accommodate future growth, so you could have a small capability installed now and -- (inaudible) -- growth in the future, and as well as deconversion to forms suitable for the production of uranium fuels, which could include oxides and metal.

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So there's quite a bit of -- there's quite a few options in this. And I'll get into what we specifically analyzed as part of the EIS, like I said, coming up in the next slide.

However, first, I'm getting some feedback. I want to make sure that I'm still okay.

Okay. So first, before I do that though, I would mention that the alternative is the no action alternative, which would be the status quo, and this is where DOE would not implement the proposed action to acquire HALEU, and development of domestic supply of HALEU, in this situation, would be left to industry or industry would reliant of foreign sources of HALEU.

So on this slide, I'll walk through the six activities associated with the procurement -- excuse me -- the proposed action. I'll start on the top left of the slide, with uranium production, also known as mining.

So this is uranium ore processed to yellowcake. So that's the first step. The second step chemically is into uranium hexafluoride. Then the enrichment is the next step -- (inaudible.)

And this may occur in three steps. And this could be at multiple locations potentially. So it could include enrichment to no more than 5 weight

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percent, enrichment greater than 5 and less than 10 weight percent, and, finally, enrichment from less than 10 percent to less than 20 percent U-235 in a Nuclear Regulatory Commission Category II facility.

The next step in the process that was analyzed is the deconversion step, so this is chemically deconverting uranium hexafluoride to uranium oxide, metal, and potentially other forms, again, in a Nuclear Regulatory Commission Category II facility. And the purpose of this step is to make the uranium suitable for processing into nuclear fuel.

Finally, there may be a storage step, again, in a Nuclear Regulatory Commission Category II facility, so we may have to store material before fuel fabrication occurs.

And as you probably noticed, there are many arrows in these boxes that touch on transportation, so each step would include some form of transportation between the sites or the processes.

And you already brought that up pre-meeting as something you're interested in, so that's also there.

So those are the six activities that we analyzed directly that are associated with the proposed action.

In addition to those -- in addition to the

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previous activities, we considered three reasonably foreseeable activities that could result from implementation of the proposed action.

So those include fuel fabrication, as I kind of alluded to a minute ago, so fuel fabrication for a variety of fuel types, secondly, reactor operations itself to generate electricity, so this could include demonstration and test, power, or isotope production, and, finally, of course spent fuel storage and disposition, so the waste following would have to be stored and/or disposed of.

So I know that was a long slide, but that covers all the activities we analyzed as well as the foreseeable activities as part of this effort.

So the next slide, I'll discuss the approach to impact analysis. So existing NEPA evaluations were used to assess similar facility construction and operations located at the following types of sites.

So these are located at existing facilities, other industrial facilities -- other industrial sites rather, known as brownfield sites, and previously undeveloped, also known as greenfield sites.

So one contributing factor to the significance of environmental impacts is where facilities are located geographically, however, as I mentioned earlier

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in the first step of the presentation, the locations will not be chosen as part of the record of decision for this EIS, as potential fuel cycle facilities are subject to an ongoing procurement process.

To determine the potential environmental consequences without site specific information in hand, we evaluated existing documentation for uranium fuel cycle facilities used for the low-enriched uranium in the current commercial market, but we also included HALEU fuel cycle NEPA reviews where we were able.

So the activities described in the proposed action are not unique, because the low enriched uranium fuel cycle has a lot of the same operations, same facilities, possibly, and the same processes.

So we really drew from existing sites and processes in order to do this. And because of that, we had some scenarios this could include.

So this -- as I mentioned, this could include existing facilities, other sites, brownfield sites, or greenfield sites.

And to estimate a potential impact, we leveraged the existing NEPA documentation that exists and determined that -- determined the relative impacts, which I'll cover on the next slide, with performing these activities at these existing facilities,

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brownfield, or greenfield sites using the regulatory commission's impact assessment categories.

So with all that said, potential modification, construction, and operation of these facilities, again, as I alluded to, would be subject to the Nuclear Regulatory Commission, other federal agencies, or agreement state licensing and environmental review, such as NEPA review, and potential other federal and state permitting.

So I kind of hit that in the first half as well. You know, this would definitely include additional site specific environmental analysis, in the future, by regulatory agencies.

So I'm moving on to the summary of potential impacts. And, again, I will -- I'll reiterate that the full analysis is covered in the draft report, and you can pick up a copy in the back.

So the Environmental Impact Statement adopts the Nuclear Regulatory Commission impact assessment categories from the NEPA documents that were used as the basis for the impact analysis.

And first, I will -- I will read the definitions for you so we have context, and then I'll explain a little bit more about how we approach this.

So small impacts are defined as having

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environmental effects that are not detectible or are so minor that they would neither destabilize nor noticeably alter any important attribute of the resource.

Moderate impacts are defined as having environmental effects that are sufficient to alter noticeably, but not destabilize, important attributes of the resource.

And, finally, large impacts are defined as having environmental effects that are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Okay. So the summary of impacts at existing uranium fuel cycle facilities, most impacts to existing facilities, according to the analysis, would be small, however, the greatest potential for large impact is associated with mining and milling. Impact levels would be mine specific.

Impacts at other industrial sites, or brownfield sites, we determined to range from small to moderate, however, there could be potentially large impacts in areas associated with site demographics and historic, cultural, and ecological resources.

Impacts at previously undeveloped, or greenfield sites, are similar to brownfield sites.

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There could be potentially larger impacts here due the increased unknowns about the site.

These are characteristics that have been analyzed historically -- (inaudible) -- site characteristics, including pertaining to historic, cultural, and ecological resources at the site.

So that was a very quick explanation of the impacts -- the summary of the impacts. And as I mentioned, a full report is available now for public review, so it's available in the back room and on our website.

So this concludes the presentation part of the meeting. I want to thank you for attending. I'll hand it back to Wendy.

But we'll be having Q and A later in the meeting and a public comment period as well, so there's plenty of time to ask follow-up questions or ask us about this as well as make public comments, of course.

So thank you.

QUESTION AND ANSWER SESSION

MS. LOWE: So that concludes the presentation portion of this listening session. And now we'll open the question and answer portion.

And then any questions you might have about

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the High-Assay Low Enriched Uranium Program and Draft Environmental Impact Statement, we have Mike Reim, Jon Carmack, and Jason Anderson here that will answer questions on behalf of the Office of Nuclear Energy.

So it's my job that you have a chance to ask any questions that you might have about those two topics.

We wanted to see if there were any tribal leaders in the room that would like to speak first?

So looks like we're okay.

I will be bringing the microphone to you if you have a question that you want to ask. So if you have one, raise your hand, and I'll come to you.

As you begin your question, we'd like to invite you to introduce yourself and share your tribal affiliation as you begin.

We're not going to limit the time that you have to speak, so take as much time as you have -- want to ask questions.

I would like to point out that the questions and answers will not be included in the Final Environmental Impact Statement.

So if you ask a question that actually is also a comment, I want you to remember to repeat that when

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we move to the comment portion of the meeting that's being recorded. Those are the -- that's the more important nuggets we're asking for you to share with us tonight.

So with that, I will open the microphone for anybody that has any questions they would like to ask about the HALEU program or the Environmental Impact Statement.

Okay. We've got a question. I'm coming to you.

MS. GOVER: My name is Lisa Gover. I'm not here -- I'm not going to say any tribal affiliation.

I work here at Gila River Indian Community, Department of Environmental Quality. My questions are my own. I'm not representing the tribe. Please do not put that in your notes. I'm not here for the tribe.

This is tribal consultation -- or I think that it's tribal consultation, because I'm here as an interested party only.

Like I said, I'm off the clock. But I'm also a person in -- (inaudible) -- lots and lots of nuclear issues.

My question is this. After all that, my question is this. And I apologize for being late. That's the other thing. I had to drive here from work.

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My question is this. I heard the small impacts part of your presentation, and I think I understood that you said that the large impacts would mostly be related to mining and milling.

I'm always interested when we start talking about the big league. When the United States starts talking about uranium mining and and nuclear energy, I always think, what are you going to do with the waste?

And isn't that an environmental concern that we should be discussing when we're talking about new issues like that?

Thank you.

MR. REIM: Thank you for that question. To clarify, when you say "the waste," are you referring to mining -- like, mining waste or -- (inaudible.)

MS. GOVER: Yes. We can go do both.

MR. REIM: (Inaudible.)

THE REPORTER: I'm having a hard time hearing Michael.

MR. REIM: I'll repeat my question just for the court reporter.

So I was asking for a clarification as to whether the question was about mining waste or fuel as part of operating advanced reactors.

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MS. GOVER: The answer is both.

MR. CARMACK: Good evening. I'm going to speak into the microphone because I think this buzzing is a little distracting.

But I'm Jon Carmack. I'm the Deputy Assistant Secretary for the nuclear fuel cycle -- Office of Nuclear Fuel Cycle in the Department of Energy, and my office is responsible for executing these -- these two procurement actions.

Thank you for your question. We understand the concern with mining waste, mining action, as well as the fuel that's generated afterwards.

I believe I have a two-part question -- or two-part answer to your question. Sorry.

First, to the extent of the fuel from the reactors that'd be used as material, we consider that a reasonably foreseeable activity in the use of this material, ultimately, but is beyond the context of this particular EIS study and action.

Because it -- in the presentation, we noted the reactor projects that are currently underway sponsored by the Department of Energy, that we utilized this type of fuel.

There are other reactors in the commercial sector that may also use this type of fuel, but they

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are beyond the consideration of this particular EIS as well.

Our EIS is really looking at the procurement action associated with the Department of Energy acquiring material at this specific enrichment level, higher than normal in the HALEU fuel supply today -- (inaudible.)

To the mining question, we understand the concern about mining and mining activities, especially around uranium, which is why we're out here in Arizona to get public comment on this -- on this topic and to hear from the public their concerns.

Also, because our action is related specifically to the enrichment process and deconversion process, we don't consider this particular activity directly impactful on the uranium -- or on the mining sector, but we understand the potential that, in the future, because of this action, we could incentivise and increase demand in production from mining activities. So we also considered that a -- a reasonably foreseeable activity in the EIS.

And -- but the site specifics are uncertain at this time. So we consider those -- they will be studied in the future, as sites are identified for actual activity.

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MR. ANDERSON: I would just say that -- just briefly, that we estimated the impacts of both mining and -- (inaudible) -- at a high level.

And the EIS really represented the information that we have at this time, considering that we don't know where these potential fuel cycles will be, you know, what -- you know, how they will be supplied with material, et cetera.

So -- so as Jon said, we acknowledge that those are foreseeable activities, and we did the best we could, we thought, to analyze those at a high level in the Environmental Impact Statement.

MS. LOWE: Did you have another question following that?

(No response.)

MS. LOWE: Okay. Other questions? Looks like we have one.

MR. MCCABE: My name is Thomas McCabe, from the Navajo Nation. My question is -- I'm just wondering at what stage you are with this development.

Are you past -- like, passing the testing stage and maybe going towards actually identifying sites where these power plants could -- could be located at?

And I know we have uranium down here in the

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southwest. And I'm sure that -- that some of the uranium will be procured from this area, so I think that's just a given.

But beyond that, I'm just curious to see what the ideal locations are, if you have identified any of those locations yet.

And I do see a real need for this type of energy going into the future, and I'm glad that your group is working on this, because we can't just depend on solar and wind. And we definitely have used coal, but I don't think we're going back to coal for a while. So the next choice would be the nuclear.

And I just want to get a better understanding of, when you say low -- low grade -- or what was it -- low enriched uranium, so at a lower enriched uranium, does that mean that the radiation is less coming from the -- the ores?

That's what I'm trying to understand right now, is what -- what is meant by low? Because radiation is there, and it's got this long shelf life, and it's always going to be like that, I guess, until it's -- even when they're in the waste stage, there's -- there's still radiation with the waste.

So I just need clarification on the potential sites and then also the enrichment aspect of, you know,

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calling it low enriched.

MR. REIM: Okay. Thank you very much. So I kind of heard three distinct questions, and I will paraphrase those, and then we'll work through all of them.

So I kind of heard a question about -- sort of a general question about what the status is of the program, where we are in terms of, you know, site or building facilities, making choices, or things like that.

And then the second question I heard, essentially, was -- more specifically, it was, are there ideal locations for these activities, or are there specific locations for these activities that have been selected? Again, I'm paraphrasing.

And then the third question I heard was a question about low enriched uranium specifically. And while you didn't use the word "hazard," I think you're sort of asking the question of, is low enriched uranium hazardous, or is it -- is it more hazardous than natural -- (inaudible) -- or what is the relationship between those things?

Is that roughly the sort of questions you had?

MR. MCCABE: Yes.

MR. REIM: Okay. So let me start with the

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first one. And I'm going to ask Jon to help fill in some detail here as needed.

So I guess I want to start by stating that, there's a difference between the general program activities that are funded in the Office of Nuclear Energy -- (inaudible) -- because we have a lot of research -- a lot of reactor related research as well that we fund, as well as, for example, the two demonstration reactors that were selected by the department to be funded and built. So that's sort of what our office does.

But separately, although related, there's the scope of what we analyzed in this Environmental Impact Statement, and those activities were covered on the slide that showed each of the -- you know, the many boxes with all the arrows connecting them.

So in terms of the program -- so I'm speaking about the program, not the Environmental Impact Statement.

For the program at large, we have -- we have funded and we've made progress on quite a few things. I think the two -- two banner projects are probably the -- (inaudible) -- but we also found a lot of R&D related -- research and development related to

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developing new fuel types that would go in these reactors as well as development of, like, test facilities to test the characteristics of the fuel and quite a few other R&D projects that are related to advanced nuclear energy, advantages of safer designs, things like that. So that's, more broadly, the program.

Now, if I switch back to what we analyzed in this Environmental Impact Statement -- and I'll get into your second question for this part.

So we do not have -- we did not analyze specific locations in this Environment Impact Statement, and we don't expect to analyze those as part the record of decision for this EIS.

So we don't have a location that was picked. We don't have a proposed location -- specific location to analyze.

But what we did, when we analyzed the historic and ongoing environmental information, is we took in as much information as possible from existing sites.

So the U.S. has mined uranium, as you probably know better than anyone, for quite a long time, maybe 70 years or so.

But, also, the United States has plants.

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There is a demonstration enrichment plant in Piketon, Ohio. And there's quite a few other facilities all along that chain in the slide.

So what we did is, we took examples of environmental review from all those places and applied it to this action, which is to procure -- the proposed action, which is to procure HALEU. So that's what we drew from to do this analysis.

But to, maybe, put a fine point on it, your question about, are there specific locations, the short -- the shortest possible answer is, no, there aren't in terms of our scope.

So I'm going to pause there before I get to your third question.

Did you want to add anything to that question, Jon?

MR. CARMACK: I think I'm okay for now.

MR. REIM: Okay. So I might ask for Jon to help on this third one as well, because this actually was asked in a slightly different way at a previous meeting, about the hazards associated with the HALEU enrichment.

So I think I'm just going to hand that one to you, if you're prepared, Jon.

MR. CARMACK: Is this any different material

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than the current low enriched uranium --
(MULTIPLE SPEAKERS.)
MR. CARMACK: This HALEU material is effectively the same. It starts -- if you start all the way at the mining process, the source of uranium is the same, the enrichment process is basically the same, and you just do that enrichment process, let's say, for a longer period of time to get it to a higher level of -- of the -- from 5 percent to 19 percent.
Now, the radioactivity of uranium is primarily due to the decaying -- (inaudible) -- products that come from the U-238 isotopes in the uranium itself.
And so that radioactivity of fresh material that hasn't been in a reactor is -- is -- is connected to the concentration of U-238 versus -- (inaudible.)
So, actually, as you go up in -- in enrichment, the material becomes less reactive. So it doesn't mean it -- it is any less hazardous necessarily or -- from a toxicity point of view, but it -- it's, to me, no more or less hazardous than standard low enriched uranium.
Once you go through the reactor and it's irradiated, it produces power, it has fission, just like low enriched uranium, but the -- the -- it will depend on the type of fuel that's used and the duration

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that it's used for in the reactor and for how -- you know, how long it's used and at what power it's used at.

So there are many conditions that will affect the final radioactivity spent in the fuel. And so those are still -- they're -- we can calculate them, but they're still reasonably similar -- "reasonably" is maybe not the right word -- generally equivalent.

MR. MCCABE: So if you have a higher grade, would that mean that the efficiency of the chain reaction increases, or -- is that what it is?

MR. CARMACK: You can be higher efficient in how you utilize the fuel in the reactor, and so the reactor can produce more power for a longer duration between refueling, and so it does go to the economics of the ability of the reactor's improved power.

MR. MCCABE: And the general use, how long does the material last in a particular rod or -- when it's being used?

MR. CARMACK: So in current reactors. So the reactors that we have operating in United States today increase in power.

Typically, a fuel assembly will spend three to five years in the reactor. Every 18 months to 24 months, you refuel about a third of the reactor.

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In some of these new advanced reactors, we're seeing underdevelopment today. Some of them are targeting, maybe, refueling every 10 years, some of them targeting producing higher amounts of power for those longer durations.

But it all kind of goes to how much U-235 the enrichment level is available to them to utilize in the reactor for -- for those durations.

So we're seeing a variety, but definitely longer than in the -- the current reactors today.

MR. MCCABE: Thank you. Thank you much.

MS. LOWE: Other questions? Would you like a few moments of silence to think about -- do you have --

MR. MCCABE: A comment.

MS. LOWE: Oh, comments.

Yeah. I want to make sure we've taken all the questions.

Do you want to go into the comment portion of the meeting?

COMMENTS

MS. LOWE: Okay. Okay. I just want to make sure. Okay. Okay. It's currently 6:22, and we're going to move into the final portion of this listening session.

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So we'll begin now accepting formal comments on the Environmental Impact Statement.

I wanted to point out that Michael Reim, Jon Carmack, and Jason Anderson will be listening and will not respond to any comments that are submitted this evening.

We do have a court reporter that's transcribing the comments from the listening session. And so we want to invite you -- am I too loud?

Okay. So speak clearly into the microphone when you're providing comments so we make sure we capture your comments accurately.

So all comments that are received during the comment period will be included in a comment response document, and that comment response document will include DOE's responses to the comments that have been received on the Final EIS, and -- and it will be included in the final -- I mean all the comments received will be included in the Final EIS.

So just like we did for the questions and answers, if you have a comment that you'd like to make, raise your hand, and I'll bring the microphone to you.

We also have a comment form that's available at the back table, and you're welcome to take that comment form with you.

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Comments from the Draft HALEU EIS In-Person Tribal Listening Session 3
Chandler, AZ, April 16, 2024, 5PM

You can fill it out tonight, leave it with us, scan it, email it to us, whatever. So that's available if you want to have some time thinking about your comments before you prepare them.

So when you are called upon to provide comments, again, introduce yourself for the record. We're not going to limit the amount of time that you have to speak, so you're welcome to speak for as long as you want.

I would reiterate that, if you raised an issue during your question that you would like to be responded to in the EIS, please repeat that as a comment during the comment portion of the meeting.

I know you may have strong opinions. And we're glad you're here. So we hope everything will stay respectful.

With that, we'll begin taking comments. So if you're interested in providing a comment, please raise your hand, and I'll bring the microphone to you.

Okay. I'm coming.

MS. GOVER: Thank you. My comment is going to be short. And it's me personally, as an American and a caring grandmother and mother, citizen of the -- of the United States, that I make this comment. My name is Lisa Gover, G-o-v-e-r.

130-1

130-1 The uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no wastes with unique characteristics. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See section 2.6.1.10. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal

I think that the Draft EIS is inadequate because it fails to address the things that I asked about, about the waste from the mining and milling process -- not just the mining, but also the milling, and -- and the -- the spent rods as well. So there you have that. That's my comment.

Thank you.

MS. LOWE: Thank you.

Do we have any other comments in the room? No comments?

MS. GOVER: I can make another comment.

MS. LOWE: Of course.

MS. GOVER: This is Lisa Gover again. My opinion is this. The nuclear waste -- the nuclear waste that has been stockpiled and is stockpiled really does need to be addressed.

It needs to be safe. It needs to be separated from the -- from the environment. And we need to be able to live safely.

But all the predictions about the waste isolation project came to fruition. Like I said, I was -- (inaudible) -- community organization, and we worked on these issues. Everything we warned about has happened at the site.

And so when you hear from people like us, it's

130-1 (cont'd)

131-1

consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

131-1 Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See Section 2.6.1.10. Separately, see the subsection entitled "HALEU Spent Nuclear Fuel Storage and Disposition" in Section 2.6.1.17, "Post-Proposed Action Activities," for a summary of the impacts of HALEU SNF management. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

not like we make this stuff up or don't have any strong opinions that are valid, and it should considered.

But nuclear waste and nuclear development is a -- is a very serious business. And if you don't know what you're going to do safely with the waste, then we shouldn't do it.

It's -- and -- and that's not my only -- I -- I believe that, if we can't get rid of solid waste, we really shouldn't make the jump.

We really shouldn't have tons and tons and tons of solid waste as far as the clothing that gets thrown away every year, food that gets thrown away every year.

It's -- I don't think we would need nuclear energy if we wouldn't produce so much junk that goes into the landfills.

I work in the environmental quality department, so there you go.

MS. LOWE: Thank you.

We had two people leave already. So last call for comments.

Okay. I'm going to share a couple more bits of information. We'd like to express our gratitude to you for participating in this process for the High-Assay Low Enriched Uranium Environmental Impact

131-1 (cont'd)

Statement.

We will -- the DOE will continue accepting comments via email and mail until April 22nd, 2024. Written comments can be sent to Mr. James Lovejoy, who is DOE's EIS document manager, by mail to the U.S. Department of Nuclear Energy, Idaho Operations Office, which is located at 1955 Fremont Avenue, mail stop 1235, Idaho Falls, Idaho 83415. You can also submit comments via email to haleu-eis@nuclear.energy.gov.

I point out that those same addresses can be used to request to be added to the mailing list for project notifications, and they can also be used to request government to government consultation. Again, DOE welcomes any request for formal government to government consultation.

More information about the project and the EIS, including the presentation slides that were used by Mr. Reim tonight, will be available on the project website, which is -- I'll read the URL again -- https://www.energy.gov/ne/haleu, H-a-l-e-u, -environmental-impact-statement.

So let the record reflect that it's now 6:31, and we'll adjourn this listening session.

Thank you so much for participating tonight.

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Your input is very much appreciated.

(Time noted: 6:31 p.m.)

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I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further; that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Date: 04/20/2024

WINDY PICARD
CSR No. 12879

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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Commenter No. 132 through 213: Campaign A

From: Edward Maxedon
To: HALEU-EIS
Subject: [EXTERNAL] Opposition to HALEU Acquisition: Comment Submission
Date: Saturday, April 13, 2024 10:02:22 AM

Mr.,

Dear Mr. Lovejoy,

I am writing to express my strong opposition to the acquisition of High-Assay Low-Enriched Uranium (HALEU) as outlined in the Department of Energy's Environmental Impact Statement. The acquisition of HALEU poses significant risks to public health, safety, and the environment, and I urge you to reconsider this proposal. ***132-1***

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats. ***132-2*** ***132-3***

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future. ***132-4***

As a concerned citizen, I urge the Department of Energy to prioritize public safety, environmental protection, and global security by rejecting the acquisition of HALEU. Instead, I call on the DOE to invest in renewable energy technologies, energy efficiency initiatives, and other clean energy solutions that will benefit current and future generations without putting our communities at risk. ***132-5*** ***132-6***

Thank you for considering my comments on this crucial issue. I trust that you will act in the best interests of the public and the planet by rejecting the acquisition of HALEU. ***132-7***

Sincerely,

Sincerely,
Edward Maxedon

132-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Regarding your concerns about the potential impacts of the Proposed Action, please see Chapter 3 of the EIS, which provides an analysis of the potential impacts. This analysis determined that most impacts associated with implementing the Proposed Action at existing uranium fuel cycle facilities would be SMALL. The greatest potential for larger impacts is associated with mining and milling, but impact levels would be mine specific. Impacts at other industrial (brownfield) sites generally ranged from SMALL to MODERATE with potentially larger impacts in areas associated with site demographics and historic, cultural, and ecological resources. Impacts ate previously undeveloped (greenfield) sites were similar to locating facilities at brownfield sites. However, greenfield sites had potentially larger impacts due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

132-2 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that ade quate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 132 through 213: Campaign A

This comment is the first comment submittal of "Campaign A." 71 commenters submitted this identical comment and are listed below. Several commenters submitted twice, which is indicated by a (2) following their name.

Edward Maxedon
Tracey Katsouros
Ellen Atkinson
Laura Colston
Eric Robson
Ingrid Rochester
Norda Gromoll
Alan Wojtalik
Michael Parsons
Elizabeth Butler
Robert Reed
A.F. Shayne
Terry Vollmer
Ross Heckmann
Holly Burgin
Nora Roman
Julie Adelson
Vicki Hughes (2)
Suzanne Miller
Deborah Lyons
Betty Winholtz
Todd Snyder
Linda Silversmith
Theodore Voth
I. Engle (2)
Vic Bostock
Michael Iltis (2)
Maggie Louden
Stephen Dutschke
Nikki Nafziger
Carol Gordon
Eric Morris
Kellie Smith
Irene Gnemi
B G
El. Pe
David Burtis
Jessea Greenman
Meredith Needham
Sharon Gillespie
Abigail Gindele
Harold Watson
Gaia Mika
John Lamb
Russell Novkov
Nikki Wojtalik
Beth Goode
Roger Schmidt
Probyn Gregory (2)
Lucy Duff
Samuel Morningstar
Betty Winholtz
Lacey Hicks
Wendy Alberg
Stacie Charlebois
Tia Triplett (2)
Rob Carter
Nancy Lyles
Therese Ryan
Dan Hubbard
Claudia Van Gerven (2)
Jeannette Bartelt
Susan Porter
M Langelan
Annick Richardson
Suzanne Miller
Sharon Paltin
Julia Radwany
Marilyn Shepherd
Pat Bulla
Stephen Dutschke

Commenters who submitted variations of this comment are presented immediately following Comment No. 132.

Mary Rojeski (Comment No. 145)
Karen Jacques (Comment No. 151)
Charlene Woodcock (Comment No. 169, 213)
Joan Lobell (Comment No. 192)
Marty Mason (Comment No. 196)
Christopher Lish (Comment No. 206)

132-3 To address safety concerns related to the production, transportation, and storage of HALEU, the EIS considers the potential for accidents, contamination, and terrorist threats. In its analysis, DOE considered occupational risks under normal operations, and radioactive and hazardous material releases under both normal operations and accident scenarios. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents . The analyses includes assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. These impacts, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos Technical Report (Leidos, 2023), are summarized in Tables A-1 through A-4 and A-6 through A-10 of Volume 2, Appendix A, of the HALEU EIS. To the extent possible, transportation issues associated with production and storage of HALEU are addressed in the HALEU EIS (See Sections S.7.1.6, 2.1.6, 3.6 of the EIS) and supported by the analysis in Section 6 of the Leidos Technical Report (see Leidos, 2023). Many requirements, such as those pertaining to site evaluation, design, construction, commissioning, operation, and preparation for decommissioning of facilities, exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. Further, as part of the licensing process for nuclear facilities, DOE expects that the relevant regulatory authority would analyze a comprehensive set of accident sequences and the likelihood and consequences of these accidents to assure safety of the public and workers. DOE also expects that intentional destructive acts (e.g., terroristic acts, sabotage) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism"; 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal"; and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

132-4 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of this CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to

fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

132-5 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the response to Comment 132-1 and discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

132-6 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced

Commenter No. 132 through 213: Campaign A

reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an Organization for Economic Cooperation and Development - International Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

132-7 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 145: Mary Rojeski

From: MARY ROJESKI
To: HALEU-EIS
Subject: [EXTERNAL] Opposition to HALEU Acquisition: Comment Submission
Date: Saturday, April 13, 2024 1:08:48 PM

Mr.,

Dear Mr. Lovejoy,

I am writing to express my strong opposition to the acquisition of High-Assay Low-Enriched Uranium (HALEU) as outlined in the Department of Energy's Environmental Impact Statement. The acquisition of HALEU poses significant risks to public health, safety, and the environment, and I urge you to reconsider this proposal. *145-1*

Hell NO to this!!! *145-2*

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats. *145-3* *145-4*

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future. *145-5*

As a concerned citizen, I urge the Department of Energy to prioritize public safety, environmental protection, and global security by rejecting the acquisition of HALEU. Instead, I call on the DOE to invest in renewable energy technologies, energy efficiency initiatives, and other clean energy solutions that will benefit current and future generations without putting our communities at risk. *145-6* *145-7*

Thank you for considering my comments on this crucial issue. I trust that you will act in the best interests of the public and the planet by rejecting the acquisition of HALEU. *145-8*

Sincerely,

Sincerely,
MARY ROJESKI

145-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Regarding your concerns about the potential impacts of the Proposed Action, please see Chapter 3 of the EIS which provides an analysis of the potential impacts. This analysis determined that most impacts associated with implementing the Proposed Action at existing uranium fuel cycle facilities would be SMALL. The greatest potential for larger impacts is associated with mining and milling, but impact levels would be mine specific. Impacts at other industrial (brownfield) sites generally ranged from SMALL to MODERATE with potentially larger impacts in areas associated with site demographics and historic, cultural, and ecological resources. Impacts at previously undeveloped (greenfield) sites were similar to locating facilities at brownfield sites. However, greenfield sites had potentially larger impacts due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

145-2 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

145-3 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the proliferation evolving challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to

Commenter No. 145 (cont'd): Mary Rojeski

Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

145-4 To address safety concerns related to the production, transportation, and storage of HALEU, the EIS considers the potential for accidents, contamination, and terrorist threats. In its analysis, DOE considered occupational risks under normal operations, and radioactive and hazardous material releases under both normal operations and accident scenarios. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents. The analyses includes assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. These impacts, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos Technical Report (Leidos, 2023), are summarized in Tables A-1 through A-4 and A-6 through A-10 of Volume 2, Appendix A, of the HALEU EIS. To the extent possible, transportation issues associated with production and storage of HALEU are addressed in the HALEU EIS (See Sections S.7.1.6, 2.1.6, and 3.6 of the EIS) and supported by the analysis in Section 6 of the Leidos Technical Report (Leidos, 2023). Many requirements, such as those pertaining to site evaluation, design, construction, commissioning, operation, and preparation for decommissioning of facilities, exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. Further, as part of the licensing process for nuclear facilities, DOE expects that the relevant regulatory authority would analyze a comprehensive set of accident sequences and the likelihood and consequences of these accidents to assure safety of the public and workers. DOE also expects that intentional destructive acts (e.g., terroristic acts, sabotage) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism"; 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal"; and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

145-5 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues" of this CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities.

Commenter No. 145 (cont'd): Mary Rojeski

However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

145-6 DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

145-7 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues" of this CRD. Some

Commenter No. 145 (cont'd): Mary Rojeski

people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need" of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

145-8 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 151: Karen Jaques

From: Karen Jacques
To: HALEU-EIS
Subject: [EXTERNAL] Opposition to HALEU Acquisition: Comment Submission
Date: Saturday, April 13, 2024 1:17:33 PM

Mr.,

Dear Mr. Lovejoy,

I am writing to express my strong, strong opposition to the acquisition of High-Assay Low-Enriched Uranium (HALEU) as outlined in the Department of Energy's Environmental Impact Statement. The acquisition of HALEU poses significant risks to public health, safety, and the environment, and I urge you to reconsider this proposal. There is no safe way to dispose of nuclear waste in any form. Much of it remains radioactive for thousands of years. We are living in a time of extreme climate peril (nuclear is not an answer to that problem) and of increasing war and violence. If a nuclear facility were to be destroyed, there would be no way to clean up the damage. Just look at Fukushima and at Chernobyl. If we had a responsible government, it would be phasing out all nuclear, not looking to increase it. The mining of uranium causes horrific environmental damage. The Navajo reservation land where uranium was extracted remains poisoned. Hanford remains a terrible disaster waiting to happen. Expanding nuclear in any way, including this totally misguided HALEU proposal is a massive risk to human health and safety and to the health and safety of every species on earth. ***151-1*** ***151-2*** ***151-3*** ***151-4*** ***151-5*** ***151-6***

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats. We need to be working on ending the nuclear era, not expanding it and not one more American (or anyone anywhere) should be put at risk. ***151-7*** ***151-8*** ***151-9***

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future. ***151-10***

As a concerned citizen, I urge the Department of Energy to prioritize public safety, environmental protection, and global security by rejecting the acquisition of HALEU. Instead, I call on the DOE to invest in renewable energy technologies, energy efficiency initiatives, and other clean energy solutions that will benefit current and future generations without putting anymore of our communities at risk. ***151-11*** ***151-12***

Thank you for considering my comments on this crucial issue. I trust that you will act in the best interests of the public and the planet by rejecting the acquisition of HALEU. I am appalled that you have even been considering it. ***151-13***

Sincerely,

Sincerely,
Karen Jacques

151-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Regarding your concerns about the potential impacts of the Proposed Action, please see Chapter 3 of the EIS, which provides an analysis of the potential impacts. This analysis determined that most impacts associated with implementing the Proposed Action at existing uranium fuel cycle facilities would be SMALL. The greatest potential for larger impacts is associated with mining and milling, but impact levels would be mine specific. Impacts at other industrial (brownfield) sites generally ranged from SMALL to MODERATE with potentially larger impacts in areas associated with site demographics and historic, cultural, and ecological resources. Impacts at previously undeveloped (greenfield) sites were similar to locating facilities at brownfield sites. However, greenfield sites had potentially larger impacts due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

151-2 The uranium ore mined and processed to produce the HALEU under the proposed action would be a small percentage of the uranium ore mined as part of the ongoing LEU activities. There are no wastes with unique characteristics. Waste quantities generated represent small fractions of the commercial facilities' capacities. Waste generated at existing facilities or new facilities at brownfield or greenfield sites would have SMALL impacts, both for individual HALEU fuel cycle activities and across all activities. See section 2.6.1.10. The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at

Commenter No. 151 (cont'd): Karen Jaques

the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

151-3 As discussed in Section 1.1, Purpose and Need, of the HALEU EIS, the proposed action is needed to create a supply of HALEU (primarily for energy production). Thus, examining alternatives to nuclear power for mitigating climate change is out of scope for the HALEU EIS. Climate change impacts from the proposed action activities are discussed in Section 4.3 of the HALEU EIS. DOE acknowledges that accidents have occurred in the past. DOE, other nuclear regulators and the nuclear industry have taken the opportunity to learn from past accidents. As part of the licensing process for advanced reactors, DOE expects that the cognizant regulatory authority will perform analyses to consider various accident sequences and the likelihood and consequences of these accidents. The advanced nuclear reactors would be expected to be designed to include features that make the reactors passively safe and preclude the occurrence of accidents and also prevent or mitigate the consequences of other accidents considered by the reactor designers.

Commenter No. 151 (cont'd): Karen Jaques

Intentional destructive acts such as from war and violence are also expected to be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about nonproliferation and terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism," of this CRD for discussion of this topic of interest and DOE's response.

151-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussions in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

151-5 The Technical Report (Leidos, 2023) prepared by DOE in support of the EIS contains a detailed analysis of the potential health and environmental impacts associated with ISR mining and conventional mining and milling and processing. Please refer to Chapter 1 of the Technical Report for further information specific to mining and milling, Chapter 2 for Uranium Conversion, and Chapter 3 for Uranium Enrichment. The Final EIS has been updated to include specific hot links to the appropriate section of the 500+-page Technical Report (Leidos, 2023) to provide more detailed analyses of the basis for the conclusions. Although legacy contamination has occurred from past uranium recovery and enrichment activities, significant evolution of practices, regulations, and oversight has greatly reduced the potential for contamination. As described throughout the Technical Report (Leidos, 2023), ongoing activities at existing facilities (also see Figure 1-3 of the Technical Report) and construction and operation of new facilities are, and would be, conducted under the cognizant regulatory agencies NEPA evaluations and associated license and permitting conditions. Please also see Section 2.4, "Legacy Issues," to the CRD to provide additional information.

151-6 DOE acknowledges your opposition to the Proposed Action. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information." In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration,

Commenter No. 151 (cont'd): Karen Jaques

and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. The HALEU EIS presents an assessment of the impacts to public health and safety, occupational health and safety, and the environment for the Proposed Action. This assessment is contained in Chapter 3 and supported by a summary of impacts in Appendix A. This analysis is based, as described in the introduction to Chapter 3, on multiple NEPA analyses for activites like those that would be performed under the Proposed Action. Additionally, one of the references for the EIS, the Technical Report (Leidos, 2023), provides information from the reference NEPA documents and an assessment of how the impacts in those documents apply to the Proposed Action.

151-7 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

151-8 To address safety concerns related to the production, transportation, and storage of HALEU, the EIS considers the potential for accidents, contamination, and terrorist threats. In its analysis, DOE considered occupational risks under normal operations, and radioactive and hazardous material releases under both normal operations and accident scenarios. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents. The analyses includes assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. These impacts, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos Technical Report (Leidos, 2023), are summarized in Tables A-1 through A-4 and A-6 through A-10 of Volume 2, Appendix A, of the HALEU EIS. To the extent possible, transportation issues associated with production and storage of HALEU are addressed in the HALEU EIS (See Sections S.7.1.6, 2.1.6, and 3.6 of the EIS) and supported by the analysis in Section 6 of the Leidos Technical Report (Leidos, 2023). Many requirements, such as those pertaining to site evaluation, design, construction, commissioning, operation, and preparation

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for decommissioning of facilities, exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. Further, as part of the licensing process for nuclear facilities, DOE expects that the relevant regulatory authority would analyze a comprehensive set of accident sequences and the likelihood and consequences of these accidents to assure safety of the public and workers. DOE also expects that intentional destructive acts (e.g., terroristic acts, sabotage) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism"; 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal"; and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

151-9 This EIS only evaluates HALEU. Other nuclear power projects (e.g., LEU fueled reactors, thorium fuel reactors, etc.) are outside the scope of the Proposed Action. Regarding your concerns about the potential impacts of the Proposed Action, please see Chapter 3 of the EIS which provides an analysis of the potential impacts. This analysis determined that most impacts associated with implementing the Proposed Action at existing uranium fuel cycle facilities would be SMALL. The greatest potential for larger impacts is associated with mining and milling, but impact levels would be mine specific. Impacts at other industrial (brownfield) sites generally ranged from SMALL to MODERATE with potentially larger impacts in areas associated with site demographics and historic, cultural, and ecological resources. Impacts ate previously undeveloped (greenfield) sites were similar to locating facilities at brownfield sites. However, greenfield sites had potentially larger impacts due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussions in Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information.

151-10 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of this CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring

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and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. These reports continue to support the conclusion U.S. nuclear power plants do not affect public health and safety. (NRC 2024 Backgrounder Analysis of Cancer Risks in Populations Near Nuclear Facilities) The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

151-11 DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

151-12 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health.

Commenter No. 151 (cont'd): Karen Jaques

For additional information see Section 2.4, "Legacy Issues," of this CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

151-13 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 169: Charlene Woodcock

From: Charlene Woodcock
To: HALEU-EIS
Subject: [EXTERNAL] Opposition to HALEU Acquisition: Comment Submission
Date: Saturday, April 13, 2024 5:24:47 PM

Mr.,

Dear Mr. Lovejoy,

As a grandmother, I write to say thatI've worried about the dangers of nuclear energy since my first child was born. WE HAVE NO RIGHT TO BURDEN FUTURE GENERATIONS WITH TOXIC RADIOACTIVE WASTE!

169-1

I am writing to express my strong opposition to the acquisition of High-Assay Low-Enriched Uranium (HALEU) as outlined in the Department of Energy's Environmental Impact Statement. The acquisition of HALEU poses significant risks to public health, safety, and the environment, and I urge you to reconsider this proposal.

169-2

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats.

169-3

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future.

169-4

As a concerned citizen, I urge the Department of Energy to prioritize public safety, environmental protection, and global security by rejecting the acquisition of HALEU. Instead, I call on the DOE to invest in renewable energy technologies, energy efficiency initiatives, and other clean energy solutions that will benefit current and future generations without putting our communities at risk.

169-1 (cont'd)

169-4 (cont'd)

Thank you for considering my comments on this crucial issue. I trust that you will act in the best interests of the public and the planet by rejecting the acquisition of HALEU.

169-1 (cont'd)

Sincerely,

Sincerely,
Charlene Woodcock

169-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Regarding your concerns about the potential impacts of the Proposed Action, please see Chapter 3 of the EIS, which provides an analysis of the potential impacts. This analysis determined that most impacts associated with implementing the Proposed Action at existing uranium fuel cycle facilities would be SMALL. The greatest potential for larger impacts is associated with mining and milling, but impact levels would be mine specific. Impacts at other industrial (brownfield) sites generally ranged from SMALL to MODERATE with potentially larger impacts in areas associated with site demographics and historic, cultural, and ecological resources. Impacts at previously undeveloped (greenfield) sites were similar to locating facilities at brownfield sites. However, greenfield sites had potentially larger impacts due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," and Section 2.3, "Nonproliferation," of this CRD for additional information.

169-2 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 169 (cont'd): Charlene Woodcock

169-3 To address safety concerns related to the production, transportation, and storage of HALEU, the EIS considers the potential for accidents, contamination, and terrorist threats. In its analysis, DOE considered occupational risks under normal operations, and radioactive and hazardous material releases under both normal operations and accident scenarios. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents . The analyses includes assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. These impacts, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos Technical Report (Leidos, 2023), are summarized in Tables A-1 through A-4 and A-6 through A-10 of Volume 2, Appendix A, of the HALEU EIS. To the extent possible, transportation issues associated with production and storage of HALEU are addressed in the HALEU EIS (See Sections S.7.1.6, 2.1.6, and 3.6 of the EIS) and supported by the analysis in Section 6 of the Leidos Technical Report (Leidos, 2023). Many requirements, such as those pertaining to site evaluation, design, construction, commissioning, operation, and preparation for decommissioning of facilities, exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. Further, as part of the licensing process for nuclear facilities, DOE expects that the relevant regulatory authority would analyze a comprehensive set of accident sequences and the likelihood and consequences of these accidents to assure safety of the public and workers. DOE also expects that intentional destructive acts (e.g., terroristic acts) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism"; 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal"; and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

169-4 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization

Commenter No. 169 (cont'd): Charlene Woodcock

of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

Commenter No. 192: Joan Lobell

From: Joan Lobell
To: HALEU-EIS
Subject: [EXTERNAL] Opposition to HALEU Acquisition: Comment Submission
Date: Monday, April 15, 2024 6:17:56 PM

Mr.,

Dear Mr. Lovejoy,

I am writing to express my strong opposition to the acquisition of High-Assay Low-Enriched Uranium (HALEU) as outlined in the Department of Energy's Environmental Impact Statement. The acquisition of HALEU poses significant risks to public health, safety, and the environment, and I urge you to reconsider this proposal. *192-1*

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats. *192-2* *192-3*

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future. *192-4*

As a concerned citizen, I urge the Department of Energy to prioritize public safety, environmental protection, and global security by rejecting the acquisition of HALEU. Instead, I call on the DOE to invest in renewable energy technologies, energy efficiency initiatives, and other clean energy solutions that will benefit current and future generations without putting our communities at risk. *192-5* *192-6*

Thank you for considering my comments on this crucial issue. I hope that you will act in the best interests of the public and the planet by rejecting the acquisition of HALEU. *192-7*

Sincerely,

Sincerely,
Joan Lobell

****
This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.

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192-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Regarding your concerns about the potential impacts of the Proposed Action, please see Chapter 3 of the EIS, which provides an analysis of the potential impacts. This analysis determined that most impacts associated with implementing the Proposed Action at existing uranium fuel cycle facilities would be SMALL. The greatest potential for larger impacts is associated with mining and milling, but impact levels would be mine specific. Impacts at other industrial (brownfield) sites generally ranged from SMALL to MODERATE with potentially larger impacts in areas associated with site demographics and historic, cultural, and ecological resources. Impacts ate previously undeveloped (greenfield) sites were similar to locating facilities at brownfield sites. However, greenfield sites had potentially larger impacts due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

192-2 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 192 (cont'd): Joan Lobell

192-3 To address safety concerns related to the production, transportation, and storage of HALEU, the EIS considers the potential for accidents, contamination, and terrorist threats. In its analysis, DOE considered occupational risks under normal operations, and radioactive and hazardous material releases under both normal operations and accident scenarios. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents . The analyses includes assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. These impacts, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos Technical Report (Leidos, 2023), are summarized in Tables A-1 through A-4 and A-6 through A-10 of Volume 2, Appendix A, of the HALEU EIS. To the extent possible, transportation issues associated with production and storage of HALEU are addressed in the HALEU EIS (See Sections S.7.1.6, 2.1.6, and 3.6 of the EIS) and supported by the analysis in Section 6 of the Leidos Technical Report (Leidos, 2023). Many requirements, such as those pertaining to site evaluation, design, construction, commissioning, operation, and preparation for decommissioning of facilities, exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. Further, as part of the licensing process for nuclear facilities, DOE expects that the relevant regulatory authority would analyze a comprehensive set of accident sequences and the likelihood and consequences of these accidents to assure safety of the public and workers. DOE also expects that intentional destructive acts (e.g., terroristic acts, sabotage) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism"; 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal"; and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

192-4 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of this CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to

fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

192-5 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

192-6 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of this CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities.

Commenter No. 192 (cont'd): Joan Lobell

However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. These reports continue to support the conclusion U.S. nuclear power plants do not affect public health and safety. (NRC 2024 Backgrounder Analysis of Cancer Risks in Populations Near Nuclear Facilities) The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need" of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

192-7 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 196: Marty Mason

From: Marty Mason
To: HALEU-EIS
Subject: [EXTERNAL] Opposition to HALEU Acquisition: Comment Submission
Date: Tuesday, April 16, 2024 3:47:53 PM

Mr.,

Dear Mr. Lovejoy,

I am opposed to the acquisition of High-Assay Low-Enriched Uranium (HALEU) as outlined in the Department of Energy's Environmental Impact Statement. The acquisition of HALEU poses significant risks to public health, safety, and the environment, and I urge you to reconsider this proposal. ***196-1***

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats. ***196-2*** ***196-3***

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future. ***196-4***

As a concerned citizen, I urge the Department of Energy to prioritize public safety, environmental protection, and global security by rejecting the acquisition of HALEU. Instead, I call on the DOE to invest in renewable energy technologies, energy efficiency initiatives, and other clean energy solutions that will benefit current and future generations without putting our communities at risk. ***196-5*** ***196-6***

Thank you for considering my comments on this crucial issue. I trust that you will act in the best interests of the public and the planet by rejecting the acquisition of HALEU. ***196-7***

Sincerely,

Sincerely,
Marty Mason

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196-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Regarding your concerns about the potential impacts of the Proposed Action, please see Chapter 3 of the EIS which provides an analysis of the potential impacts. This analysis determined that most impacts associated with implementing the Proposed Action at existing uranium fuel cycle facilities would be SMALL. The greatest potential for larger impacts is associated with mining and milling, but impact levels would be mine specific. Impacts at other industrial (brownfield) sites generally ranged from SMALL to MODERATE with potentially larger impacts in areas associated with site demographics and historic, cultural, and ecological resources. Impacts ate previously undeveloped (greenfield) sites were similar to locating facilities at brownfield sites. However, greenfield sites had potentially larger impacts due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

196-2 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of the proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 196 (cont'd): Marty Mason

196-3 To address safety concerns related to the production, transportation, and storage of HALEU, the EIS considers the potential for accidents, contamination, and terrorist threats. In its analysis, DOE considered occupational risks under normal operations, and radioactive and hazardous material releases under both normal operations and accident scenarios. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents . The analyses includes assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. These impacts, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos Technical Report (Leidos, 2023), are summarized in Tables A-1 through A-4 and A-6 through A-10 of Volume 2, Appendix A, of the HALEU EIS. To the extent possible, transportation issues associated with production and storage of HALEU are addressed in the HALEU EIS (See Sections S.7.1.6, 2.1.6, and 3.6 of the EIS) and supported by the analysis in Section 5 of the Leidos Technical Report (Leidos, 2023). Many requirements, such as those pertaining to site evaluation, design, construction, commissioning, operation, and preparation for decommissioning of facilities, exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. Further, as part of the licensing process for nuclear facilities, DOE expects that the relevant regulatory authority would analyze a comprehensive set of accident sequences and the likelihood and consequences of these accidents to assure safety of the public and workers. DOE also expects that intentional destructive acts (e.g., terroristic acts, sabotage) would be evaluated by the regulatory agencies responsible for nuclear facilities associated with the proposed action in the HALEU EIS. The evaluations would consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism"; 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal"; and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

196-4 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of this CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to

fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. And it can be done without shortcutting regulations. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

196-5 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

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Commenter No. 196 (cont'd): Marty Mason

However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. And it can be done without shortcutting regulations. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

196-7 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 206: Christopher Lish

From: Chris Lish
To: HALEU-EIS
Subject: [EXTERNAL] I oppose HALEU Acquisition -- HALEU Environmental Impact Statement
Date: Saturday, April 20, 2024 10:03:10 PM

Saturday, April 20, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415

Subject: I oppose HALEU Acquisition -- HALEU Environmental Impact Statement *206-1*

To Secretary of Energy Jennifer Granholm and DOE EIS Document Manage James Lovejoy:

I strongly oppose the acquisition of High-Assay Low-Enriched Uranium (HALEU) as outlined in the Department of Energy's Environmental Impact Statement. The acquisition of HALEU poses significant risks to public health, safety, and the environment, and I urge you to reconsider this proposal. *206-2* *206-3*

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats. *206-4* *206-5*

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future. *206-6*

As a concerned citizen, I urge the Department of Energy to prioritize public safety, environmental protection, and global security by rejecting the acquisition of HALEU. Instead, I call on the DOE to invest in renewable energy technologies, energy efficiency initiatives, and other clean energy solutions that will benefit current and future generations without putting our communities at risk. *206-7* *206-8*

Thank you for considering my comments on this crucial issue. I trust that you will act in the best interests of the public and the planet by rejecting the acquisition of HALEU. Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources. *206-9* *206-10*

206-1 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

206-2 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

206-3 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. The HALEU EIS presents an assessment of the impacts to public health and safety, occupational health and safety, and the environment for the Proposed Action. This analysis is contained in Chapter 3 and supported by a summary of impacts in Appendix A. This analysis is based, as described in the introduction to Chapter 3, on multiple NEPA analyses for activities like those that would be performed under the Proposed Action. Additionally, one of the references for the EIS, the Technical Report (Leidos, 2023), provides information from the reference NEPA documents and an assessment of how the impacts in those documents apply to the Proposed Action DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

206-4 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 206 (cont'd): Christopher Lish

Sincerely,
Christopher Lish
San Rafael, CA

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206-5 To address safety concerns related to the production, transportation, and storage of HALEU, the EIS considers the potential for accidents, contamination, and terrorist threats. In its analysis, DOE considered occupational risks under normal operations, and radioactive and hazardous material releases under both normal operations and accident scenarios. Evaluations of impacts due to occupational risks, radioactive material releases, and hazardous material releases are based on analyses in the NEPA documents. The analyses include assumptions about parameters such as weather, distance, and exposure time that would result in a conservative prediction of impacts. These impacts, which are addressed in the HALEU EIS, the HALEU EIS appendices, and in the Leidos Technical Report (Leidos, 2023), are summarized in Tables A-1 through A-4 and A-6 through A-10 of Volume 2, Appendix A, of the HALEU EIS. To the extent possible, transportation issues associated with production and storage of HALEU are addressed in the HALEU EIS (See Sections S.7.1.6, 2.1.6, and 3.6 of the EIS) and supported by the analysis in the Leidos technical report (see Leidos 2023, Section 6). Many requirements, such as those pertaining to site evaluation, design, construction, commissioning, operation, and preparation for decommissioning of facilities, exist to ensure the safety of the nuclear fuel cycle facilities as well as the reasonably foreseeable facilities and activities described in the HALEU EIS. Further, as part of the licensing process for nuclear facilities, DOE expects that the relevant regulatory authority would analyze a comprehensive set of accident sequences and the likelihood and consequences of these accidents to assure safety of the public and workers. DOE also expects that intentional destructive acts (e.g., terroristic acts, sabotage) would be evaluated by the cognizant regulatory agency responsible for permitting or licensing. These evaluations would be expected to consider mechanisms to prevent or mitigate releases from the nuclear facilities. For further discussion about terrorism concerns, see Section 3.9, "Nonproliferation and Terrorism Concerns," of the HALEU EIS. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism"; 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal"; and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

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206-7 DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

206-8 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of this CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and

Commenter No. 206 (cont'd): Christopher Lish

controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. And it can be done without shortcutting regulations. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

206-9 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

206-10 Your request has been acknowledged.

Commenter No. 213: Charlene Woodcock

From: Charlene Woodcock
To: HALEU-EIS
Subject: [EXTERNAL] Opposition to HALEU Acquisition: Comment Submission
Date: Tuesday, April 23, 2024 12:14:19 AM

Mr.,

Dear Mr. Lovejoy,

We cannot continue to subsidize and support the very costly and dangerous nuclear industry! I strongly oppose the acquisition of High-Assay Low-Enriched Uranium (HALEU) as outlined in the Department of Energy's Environmental Impact Statement. The acquisition of HALEU poses significant risks to public health, safety, and the environment, and I urge you to reconsider this proposal. ***213-1***

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats. ***213-2*** ***213-3***

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future. ***213-3***

As a concerned citizen, I urge the Department of Energy to prioritize public safety, environmental protection, and global security by rejecting the acquisition of HALEU. Instead, I call on the DOE to invest in renewable energy technologies, energy efficiency initiatives, and other clean energy solutions that will benefit current and future generations without putting our communities at risk. ***213-5*** ***213-6***

Thank you for considering my comments on this crucial issue. I trust that you will act in the best interests of the public and the planet by rejecting the acquisition of HALEU. ***213-7***

Sincerely,

Sincerely,
Charlene Woodcock

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213-1 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Regarding your concerns about the potential impacts of the Proposed Action, please see Chapter 3 of the EIS, which provides an analysis of the potential impacts. This analysis determined that most impacts associated with implementing the Proposed Action at existing uranium fuel cycle facilities would be SMALL. The greatest potential for larger impacts is associated with mining and milling, but impact levels would be mine specific. Impacts at other industrial (brownfield) sites generally ranged from SMALL to MODERATE with potentially larger impacts in areas associated with site demographics and historic, cultural, and ecological resources. Impacts at previously undeveloped (greenfield) sites were similar to locating facilities at brownfield sites. However, greenfield sites had potentially larger impacts due to increased unknowns about site characteristics, predominantly pertaining to historic, cultural, and ecological resources.

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Commenter No. 213 (cont'd): Charlene Woodcock

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213-4 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of the CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to

Commenter No. 213 (cont'd): Charlene Woodcock

facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope,," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. And it can be done without shortcutting regulations. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

213-5 DOE acknowledges your opposition to the Proposed Action, thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

213-6 DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of the CRD. Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and

Commenter No. 213 (cont'd): Charlene Woodcock

controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope,," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. And it can be done without shortcutting regulations. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

213-7 DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 217: Joan Schneider, Morongo Band of Mission Indians

From: Joan Schneider
To: HALEU-EIS
Cc: Ann Brierty; Laura Chatterton; Elisha Duncan; Ann Brierty
Subject: [EXTERNAL] Draft EIS for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)
Date: Monday, April 29, 2024 8:57:02 PM

Dear Mr. Ryan:
Thank you for following up on the Morongo Band of Mission Indians (MBMI/Tribe) request for a hard copy of the draft HALEU EIS document. In answer to your much-appreciated voicemail of April 24, 2024, Tribe received the hard copy and THPO staff have completed a preliminary review. *217-1*

At this time, Tribe does not have any comments other than, since no geographical locations have been selected, assessment of possible effects on cultural resources and tribal cultural resources of interest to MBMI is not possible. The map of existing uranium facilities that may be used for HALEU in the future does not include the ancestral lands of Tribe, but that does not rule out the future possibility that uranium mining, processing, or storage might be within Tribal ancestral lands. Tribe requests to be kept informed about the progress of the HALEU project as it moves forward. *217-2*

The Serrano and Cahuilla people of MBMI, like most indigenous groups, are extremely concerned about environmental degradation, in general, and the effect it has on human, wildlife, and plant populations and their interconnectedness as well as our responsibilities for caring for the Earth on which we all depend. It is imperative that the Department of Energy keep this in mind in its planning efforts and make every possible effort to ensure that minimal harm will occur with the implementation of the HALEU project. *217-3*

MBMI looks forward to continuing consultation for the HALEU project.

Respectfully,

Joan S Schneider, PhD
Tribal Archaeologist
Tribal Historic Preservation Office
Morongo Band of Mission Indians
12700 Pumarra Road
Banning, CA 92220
[redacted]

217-1 Thank you for confirming your receipt of the physical copy of the Draft EIS.

217-2 Thank you. As you noted in your comment, during preparation of the EIS, DOE was in the process of evaluating the responses to the requests for proposals (RFPs), and the procurement process was ongoing. Related to that process, the Office of Nuclear Energy plans to publish press releases that coincide with the selection of awardees. These notifications, however, will not coincide with the HALEU EIS, as the Department does not expect locations to be determined as a part of the Record of Decision for this EIS. Once the Department selects awardees and gains additional information, the Department may also consider sending notifications to Tribal governments in the relevant states or with vested interests in the relevant locations. The Department also expects that further site-specific outreach and consultation opportunities would be available during site-specific environmental review. During that review, the responsible agency (e.g., NRC) is expected to determine the area of potential effects and identify Tribes that may be impacted by the construction, modification, and operation of proposed HALEU fuel cycle facilities.

217-3 The Department requested proposals from commercial vendors regarding HALEU procurement and deconversion services. During preparation of the EIS, DOE was in the process of evaluating the responses to the requests for proposals (RFPs), and the procurement process was ongoing. Related to that process, the Office of Nuclear Energy plans to publish press releases that coincide with the selection of awardees. These notifications, however, will not coincide with the HALEU EIS, as the Department does not expect locations to be determined as a part of the Record of Decision for this EIS. Once the Department selects awardees and gains additional information, the Department may also consider sending notifications to Tribal governments in the relevant states or with vested interests in the relevant locations. As additional information is developed and locations for potential actions are identified, DOE expects that other federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental and Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other federal agencies. Regardless of this limitation, DOE continued to encourage Tribal participation and remains available for government-to-government consultations consistent with its trust responsibilities. Additional information on consultation has been added to Section 6.1 of the EIS.

Commenter No. 218: Laura Watchempino

From: Laura Watchempino
To: Funk, Wendy; HALEU-EIS
Subject: [EXTERNAL] Re: HALEU: Following up on Your Request for Tribal Comment Extension
Date: Friday, April 26, 2024 12:11:48 PM
Attachments: DEIS-HALEU.04.22.2024.docx

Mr, Lovejoy,
Thank you for providing me with an extended opportunity to submit these comments.

L.Watchmepino

On Mon, Apr 22, 2024 at 3:58 PM Funk, Wendy <wendy.funk@nuclear.energy.gov> wrote:

> Dear Laura Watchempino:
>
> On behalf of the U.S. Department of Energy's Office of Nuclear Energy, thank you for taking the time to attend the HALEU Tribal Listening Session(s). We sincerely appreciate the time you took to engage with us and leave comments on the Draft EIS. My name is James Lovejoy, Document Manager for the High Assay Low Enriched Uranium Environmental Impact Statement (HALEU EIS).
>
> We are following up to your request in the Tribal Listening Session for an extension to submit additional comments on the Draft EIS. DOE welcomes any additional comments you would like to provide and we are willing to work with your schedule. Would a two-week extension be sufficient for your needs with additional comments due May 6, 2024 at 11:59 p.m. ET? If more time is needed, we will consider your comments to the extent practicable while doing our best to maintain project schedule. Please reach out to us if you have any further questions or would like to discuss on a call. We look forward to working with you.
>
> James Lovejoy
>
> Department of Energy- Idaho Operations Office
>
> NEPA Document Manager
>
> [redacted]
>
> 208 526-4519 off

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Commenter No. 218 (cont'd): Laura Watchempino

April 26, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy, Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
Submitted via email: HALEU-EIS@nuclear.energy.gov

Thank you for the extended opportunity to submit these comments on the Department of Energy's (DOE) Draft Environmental Impact Statement (DEIS) for DOE Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU).

I urge DOE to select the No Action Alternative and forgo the acquisition of HALEU as the best alternative to secure our collective public health, natural resources, and the environment. ***218-1***

Alternatively, this DEIS should be withdrawn for its failure to conduct a comprehensive analysis of community environmental justice concerns as directed by Executive Orders 14906 and 12898. ***218-2***

Our Communities Should Not Bear the Risks of HALEU Production

DOE must discontinue unjustified subsidies for the production and acquisition of nuclear fuel. Our communities already bear the burdens of past federal support for the creation of atomic weapons of mass destruction, including the ensuing environmental resource damages and health disparities from historic uranium mining and milling in the Grants Uranium Mining District of New Mexico, along with continuing legacy contamination. DOE must consider the full life cycle impacts of HALEU production and use, and the potential for a revival of uranium mining and milling operations in historic uranium mining districts, as well as the high-risk transport and permanent disposal of the high-level nuclear waste that will be produced. ***218-3***

It is incumbent upon DOE to demonstrate how much federal taxpayer money will be used to subsidize the uranium industry and HALEU production facilities, including administrative and program costs. DOE must further explain how this spending contributes to our national debt. ***218-4***

Funding awards for nuclear facilities, such as TerraPower's Natrium nuclear power plant and the Centrus facility should also be analyzed as connected actions within the scope of this EIS. ***218-5***

Yet to date no new reactor design that could hypothetically use HALEU has been identified for inclusion in this DEIS, circumventing the public's opportunity to meaningfully comment on the full scope of this proposed action. ***218-6***

DOE Must Consider the Environmental Justice Impacts of HALEU Production

218-1 DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. Thank you for participating in the EIS process. Please see the discussions in Section 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD for additional information. The environmental justice impacts were evaluated to the extent practicable without have site locations to evaluate. Regarding your comment pertaining to Executive Orders, please see DOE's response below at Comment 218-2.

218-2 Environmental justice including Executive Orders 14096 and 12898 is discussed in multiple sections of Chapter 3, Impacts (e.g., Sections 3.1.11 and 3.3.8), and new sections were added to Volume 2 (Sections A.1.3.11 and A.3.3.7). These sections provide information on communities with environmental justice concerns based on select locations of current facilities, reviewing past NEPA documents, and updating U.S. Census data for block groups, cities, counties, and states. With no specific sites identified, environmental justice analysis varied according to the type of activity (e.g., mining and milling, enrichment, etc.) and the available information from existing NEPA documents. Environmental justice impacts were considered to the extent possible given that there are no specific site locations for the HALEU fuel cycle activities (and the ROD will not specify specific sites). For further information about the EJ analysis and updates in this FEIS, please see DOE's response to Comments 056-13 and 056-28. Cumulative effects are presented in Section 4 of the EIS. In addition, DOE assessed cumulative burdens on disadvantaged communities using its Energy Justice Dashboard. DOE's analysis considered a census tract that ranks in or above the 80th percentile of the cumulative sum of 36 burden indicators for a state and has at least 30% of the households identified as low-income populations as a disadvantaged community. DOE considered disadvantaged communities to include low income, high unemployment and underemployment, racial and ethnic residential segregation, linguistic isolation, high housing cost burdens, distressed neighborhoods, high transportation cost burden and/or low transportation access, disproportionate environmental stressor burden and high cumulative impacts, limited water and sanitation access and affordability, disproportionate impacts from climate change, high energy cost burden and low energy access, jobs lost through the energy transition, and access to healthcare. This analysis is presented in the Technical Report (Leidos, 2023).

218-3 As discussed in Chapter 1 of the EIS, DOE's proposed action is intended to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Further the program is to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use. DOE has issued two separate Requests for Proposal (RFPs) to address enrichment

Commenter No. 218 (cont'd): Laura Watchempino

On April 21, 2023, President Biden signed Executive Order 14906 "Revitalizing Our Nation's Commitment to Environmental Justice for All", which directed the establishment of an Interagency Environmental Justice Clearinghouse.

This order supplements the foundational efforts of Executive Order 12898 to address environmental justice. In partnership with state, tribal, territorial, and local governments, as well as community organizations, businesses, and members of the public, the federal government will advance environmental justice and help to create a more just and sustainable future for all. Each agency should make achieving environmental justice part of its mission. ***218-2 (cont'd)***

This includes efforts to identify, analyze, and address disproportionate and adverse human health and environmental risks, effects, and hazards of federal activities, such as the regulation of uranium mining and milling, nuclear facilities and nuclear fuel production, as well as the cumulative impacts of environmental and health burdens on communities with environmental justice concerns.

Each federal agency is further directed to provide opportunities for the meaningful engagement of persons and communities with environmental justice concerns who are potentially affected by federal activities by providing them with early and timely opportunities to share information or concerns and to participate in decision-making processes, so that public input provided can become part of decision-making processes. DOE failed to provide such early and timely opportunities for communities and tribal governments with environmental justice concerns during the preparation of its DOE's Draft Environmental Impact Statement for activities in support of the commercial production of HALEU, and this was raised during the tribal listening sessions for this DEIS in April, 2024, less than 2 weeks before the public comment period for this DEIS closed. ***218-7***

Our communities have suffered extensive environmental, cultural and health impacts from past uranium mining and milling activities. This DEIS failed to state whether new uranium mining and milling will be required to support the commercial production of HALEU. ***218-3 (cont'd)***

The toxic legacy of uranium production, nuclear power plant operations, and the stockpiling of nuclear spent fuel in our communities has disproportionately harmed Indigenous and low income communities, and other communities of color across the nation, but no listening sessions were conducted near communities with egregious environmental justice concerns, such as the White Mesa Band of Ute Mountain Ute or the Havasupai tribal communities located near an operating uranium mill and uranium mine. The La Sal community in Utah and many tribal communities on the Navajo Nation reside next to un-remediated uranium mines and piles of uranium mine and mill waste that threaten regional groundwater sources and continue to release radon, gamma radiation, and harmful air particulates. ***218-7 (cont'd)***

Environmental reviews under the National Environmental Policy Act (NEPA) must not only analyze direct, indirect, and cumulative effects of the proposed federal action on communities with environmental justice concerns, but should utilize the best available science and information on disparate health risks and effects arising from exposure to pollution and other environmental hazards. Such an analysis was not conducted in this DEIS. ***218-2 (cont'd)***

and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information.

The EIS analyzes all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6 of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Specifically in reference to the comment regarding the use of new uranium mining and milling, the two RFPs identified above indicate a preference for the use of existing domestic capacity. Given the low production levels for U.S. uranium mines and mills this could mean resumption of operations at currently closed mines and depending on other demands for uranium, new mining operations. The assessments of potential health impacts are based on multiple NEPA documents and documented in a Leidos Technical Report (Leidos, 2023). This report examines impacts identified in the supporting NEPA documents and uses them to develop estimates of impacts for the same or similar activities associated with the Proposed Action. In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a

Commenter No. 218 (cont'd): Laura Watchempino

Executive Order 14906 further encourages the public to submit its own recommendations to federal agencies like the DOE regarding the incorporation of environmental justice principles into its programs or policies. The DOE must then convey these recommendations to the Interagency Council.

This commenter recommends that DOE's deficient DEIS for the commercial production of HALEU be withdrawn so that a more comprehensive analysis of health and environmental justice impacts can be prepared that covers the full life cycle of HALEU production and acquisition - from uranium extraction, processing, and enrichment to HALEU nuclear facility operations, to the disposal of nuclear fuel waste byproducts that will be generated, from the cradle to grave.

Nuclear Power is Not the Solution to Climate Change

Nuclear energy production in the U.S. has created widespread environmental injustice, with dire public health and safety impacts across its full life cycle. DOE must cease funding new and expanded nuclear facilities and the production of the highly radioactive fuel that they require. Nuclear-powered energy has left a trail of environmental destruction and injustice in its wake which must fully addressed and acknowledged. The toxic legacy impacts of historic uranium mining and milling, nuclear fuel production, and nuclear plant operations have harmed a multitude of communities throughout the United States.

DOE bases its proposal in part on the false premise that new nuclear reactors, and nuclear power generated with HALEU, is necessary to abate the harm of climate change. However, new nuclear power plants typically take decades to build and generate massive budget overruns that lead to significantly higher costs for consumers of nuclear energy and the governments that subsidize them. They simply can't come online fast enough to address urgent climate change goals and other environmental issues related to energy production.

Yet this DEIS fails to identify any facilities that will use HALEU or to provide any information on the licensing of such facilities, or whether low enriched uranium fuel can be used at these facilities if HALEU is not available.

DOE should consider a more practical and reasonable alternative - the full build-out of green energy infrastructure that utilizes sustainable sources like wind and solar energy. Federal taxpayer dollars could be used to support renewable energy research and project developments that can be deployed in a much shorter time frame as the most cost-effective solution to climate change.

Nuclear Power Generation Requires a Permanent Waste Disposal Facility

DOE must acknowledge that there is no permanent disposal facility for commercial nuclear waste in the United States, making the construction of new nuclear power plants and the acquisition of HALEU untenable. Our government shouldn't be creating new nuclear fuel waste by subsidizing the nuclear power industry when there is no place to safely and permanently store the spent fuel waste that will be created or the nuclear waste that already exists.

218-2 (cont'd)

218-3 (cont'd)

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218-6 (cont'd)

218-8

218-9

different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD.

218-4 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. See Section 1.1 of the EIS and Section 2.2, "Purpose and Need," of the CRD for additional information. Regarding costs, DOE has issued two separate Requests for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

218-5 Both the Natrium advanced reactor demonstration program and the Centrus HALEU demonstration project are not covered by the scope of this EIS. While those activities may have beenDOE funded activities, they are not part of the Proposed Action. Should TerraPower or Centrus Energy Corp be selected as awardees during the RFP process, they will be required to go through an appropriate environmental review process conducted by NRC or the equivalent regulatory authority. The scope of the Proposed Action activities is described in Section 1.5 of the Final EIS.

218-6 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE developed the Proposed Action based on DOE's understanding of the current landscape of the domestic HALEU market, and potential future demand that requires the development of a HALEU fuel cycle. In addition to clarifying this

Commenter No. 218 (cont'd): Laura Watchempino

Absent additional alternatives to the only ones presented in this DEIS, the No Action Alternative is the only one that will secure our collective safety and safeguard our climate.

Alternatively, this DEIS should be withdrawn for its failure to conduct a comprehensive analysis of community environmental justice concerns as directed by Executive Orders 14906 and 12898.

Submitted by:

Laura Watchempino

[redacted]

218-1 (cont'd)

information in the Final EIS, DOE has clarified that the estimates provided in the EIS are the best available estimates for potential future demand. Please refer to Sections 2.1, "Support and Opposition," and 2.2, "Purpose and Need," of this CRD and Section 1.1 of the EIS for a further discussion of this topic. DOE's Proposed Action is intended to address the underlying dilemma of how to fulfill the need for a HALEU supply chain with the concurrent development of the reactors that demand its availability. It is true that typical commercial reactors that operate on LEU are expensive and take a relatively long period of time to license and construct. Part of the allure of advanced reactors that run on HALEU fuel is the possibility of constructing smaller, safer reactors that can be licensed and constructed in less time and at less cost. Because many of these reactor designs will be first of a kind (FOAK), there is a large level of uncertainty in the time required to design, license, and construct. The commercial industry is working with the federal government regulators (primarily the NRC) to overcome these obstacles. In the absence of NRC approved designs for advanced reactors, DOE used the *Draft Generic Environmental Impact Statement for Advanced Nuclear Reactors (ANRs)* (NRC, 2021) to estimate the environmental impacts from construction and operation of advanced reactors. Note that the use of LEU fuel in advanced reactors designed for HALEU fuel would not be efficient, and for some advanced reactors designs, would likely not work at all.

218-7 DOE prepared notifications understanding the digital limitations that Tribal communities often face. To be mindful of such limitations, DOE focused a lot of its efforts on placing advertisements in Tribal community newspapers and newsletters. Unfortunately, most Tribal newspapers were identified as having monthly postings as opposed to weekly or bi-weekly, so many advertisements were published very close to the date of the meetings. To mitigate this, DOE also published Tribal listening session advertisements in public newspapers surrounding Tribal communities. These newspapers were typically state-wide distributors and had faster publication schedules to help get information out earlier. We apologize that your community did not receive this notice earlier. During both the scoping and public comment period, DOE identified physical and digital newspaper outlets with proximity to commercial enrichment, conversion, deconversion, and fuel fabrication sites to distribute information about upcoming meetings and comment mechanisms. These locations included Illinois, Ohio, North Carolina, Idaho, Tennessee, Virginia, and Nebraska. Notices were also distributed to states historically impacted by uranium mining and milling, which included state-wide coverage in Wyoming, Texas, Arizona, New Mexico, Colorado, and Utah. During the public comment period, this notification list was expanded to include notifications near DOE National Laboratories and newspaper distributors specific to Tribal communities. In addition to the previously listed placements, these notices were placed in South Dakota, Washington DC, Oklahoma, California, Nevada, and Washington, as well as regional placements

in the Pacific Northwest and several national placements. Without knowing locations of proposed HALEU facilities and activities, DOE offered virtual meetings to provide for comments on a national level. DOE also hosted an in-person Tribal listening session in Chandler, Arizona. This session was held in coordination with another Tribal conference and was conducted to receive feedback from Tribes historically affected by uranium mining and milling activities. Please know that we are taking your feedback seriously and making a plan going forward to take into consideration different and more accessible mechanisms when notifying not only Tribal governments, but also Tribal communities. Additionally, both the public hearings and Tribal Listening Sessions were scheduled towards the end of the comment period to give enough notice and time to review the Draft EIS and prepare meaningful questions and comments to present during the meetings. Receiving public and Tribal feedback is the primary objective of hosting these hearings and listening sessions, and DOE felt it could not have been meaningful if both groups were not given sufficient time to review the DEIS and supporting documents. As stated in the HALEU EIS, this EIS does not propose selection of specific sites for HALEU fuel cycle facilities. Once sites are identified, DOE expects that site-specific environmental analysis would be conducted by the relevant regulatory agency. DOE would not be the agency responsible for performing those analyses. The responsible regulatory authority (e.g., the NRC, other Federal agencies, or states) would be responsible for the environmental analyses. See Section 1.3.1 of the EIS for additional information about public outreach.

218-8 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (see Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed

Commenter No. 218 (cont'd): Laura Watchempino

to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. This section of the EIS also cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1, "Support and Opposition," of the CRD for further information.

218-9 The HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is about 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would negligibly add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," storage of SNF at-reactor would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its

Commenter No. 218 (cont'd): Laura Watchempino

obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information.* Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 219: Nancy Ford

From: Nancy Ford
To: HALEU-EIS
Subject: [EXTERNAL] Re: feedback
Date: Tuesday, April 30, 2024 10:51:37 AM
Attachments: image001.jpg

Dear Mr. Lovejoy,
I emailed you last Monday, April 22, with questions regarding public feedback (see below). I have not received an answer to my questions yet and am hoping to hear from you soon.
Thank you.
Nancy Ford

Get Outlook for iOS

From: Nancy Ford [redacted]
Sent: Monday, April 22, 2024 12:43 PM
To: HALEU-EIS <haleu-eis@nuclear.energy.gov>
Subject: feedback

Dear Mr. Lovejoy,

Regarding the Draft Environmental Impact Statement for Activities in Support of Commercial HALEU Production, how will citizens access public feedback from all sessions held by the DOE, including the last session in Chandler, AZ, and all written comments presented to the DOE that are due today? Will the DOE be the organization to compile this information or another?

Thank you for your response.

Nancy

Nancy Ford
[redacted]

219-1

219-1 Please forgive our delayed response, the EIS team experienced accessibility issues to the HALEU Email due to updates to DOE's security protocols. The questions this commenter is referencing are identified as Comment 65-1 in this volume of the Final EIS. Please reference DOE's response to Comment 65-1.

Commenter No. 219 (cont'd): Nancy Ford

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Commenter No. 220: Jesse Deer In Water, Anishinabek Caucus

From: Jesse Deer In Water
To: HALEU-EIS
Subject: Re: [EXTERNAL] Re: HALEU: Following up on Your Request for Tribal Comment Extension
Date: Monday, May 6, 2024 2:23:54 PM
Attachments: Anishinabek Caucus Comment on HALEU (1).pdf

Mr LoveJoy,
We appreciate this opportunity to give our comment on the Dept of Energy's DEIS for HALEU. The following comment is provided by me in collaboration with the Anishinabek Caucus of The Democratic Party of MIchigan, of which i am a member, we appreciate this opportunity and I, Jesse Deer In Water, am extremely full of gratitude for this as well. As the United States and the Dept of Energy begins to find ways to be in alignment with Environmental Justice Principles and Tribal Sovereignty, engagements such as these will be more important than ever as we work with our own Democratic Processes.

Wado and Migwetch,
Jesse Deer In Water
Anishinabek Caucus

On Mon, May 6, 2024 at 1:22 PM Jesse Deer In Water <changethelifeoftheworld@gmail.com> wrote:

> Good Day Mr Lovejoy, Jesse Deer In Water here, i have our comment letter finalized and ok'd and i am wondering if I can just submit it here to you and If i need to talk to you about anything before i do.
>
> Best Regards,
> Jesse Deer In Water
> Anishinabek Caucus
>
> On Wed, Apr 24, 2024 at 11:01 AM HALEU-EIS <haleu-eis@nuclear.energy.gov> wrote:
>
> > Dear Jesse Deer in Water,
> >
> > Thank you for your questions.
> >
> > Granting you additional time is not a problem, we would, however, appreciate it if you could provide your comments within the two-week extension timeframe (due May 6, 2024, at 11:59 p.m. ET). If by the end of next week you realize you need additional time, please reach out and we will accommodate you to the best of our ability.
> >
> > The program has not extended the comment period for the general public or for all Tribes, however this extension was granted to all five commenters who requested it during last week's Tribal Listening Session. Those requestors and their Tribal affiliations are all welcome to comment through May 6, 2024.

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Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

The Department is happy to discuss special extensions granted for Tribal governments, if needed. As of this morning, we have not received extension requests made on behalf of any Tribal government or leadership.

Thank you again, we look forward to working with you.

James Lovejoy

Department of Energy-Idaho Operations Office

NEPA Document Manager

[redacted]

208 526-4519 off

From: Jesse Deer In Water <changethelifeoftheworld@gmail.com>
Sent: Monday, April 22, 2024 7:21 PM
To: HALEU-EIS <haleu-eis@nuclear.energy.gov>
Subject: [EXTERNAL] Re: HALEU: Following up on Your Request for Tribal Comment Extension

Good Day Mr LoveJoy,

This is Jesse Deer In Water, many Wados(Thank you) for reaching out in response to the request for more time and giving me this opportunity!

I am not sure of what the project schedule is but for me an extension is necessary and appreciated. I'm not totally sure how the processes work but i would use the two weeks and would not be upset at all if granted more than that .

I guess I have a couple questions, Is it my/our tribal comment only that gets an extension or is it all comments? I also noticed a couple other folks on our call who asked for an extension as well, have they been notified and/or responded? I'm mainly asking because if they needed more than 2 weeks to hear back from their tribal governments then I could not speak on their behalf. Does that make much sense?

220-1

220-1 The program did not extend the formal comment period for the general public or for all Tribes; however, extensions were granted to all five individual Tribal commenters who requested it during the Tribal listening sessions. Some of these commenters requested for their extensions to be extended to interested members of their Tribal affiliations, which was granted. These comment extensions were open until 11:59 p.m. ET on May 6, 2024. The DOE was willing to discuss special considerations for Tribal governments but did not receive extension requests made on behalf of any Tribal government or leadership.

Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

Thank you for your consideration and await to hear back from you...

Best,

Jesse Deer In Water,

On Mon, Apr 22, 2024 at 5:56 PM HALEU-EIS <haleu-eis@nuclear.energy.gov> wrote:

> Dear Jesse Deer in Water:
>
> On behalf of the U.S. Department of Energy's Office of Nuclear Energy, thank you for taking the time to attend the HALEU Tribal Listening Session(s). We sincerely appreciate the time you took to engage with us and leave comments on the Draft EIS. My name is James Lovejoy, Document Manager for the High Assay Low Enriched Uranium Environmental Impact Statement (HALEU EIS).
>
> We are following up to your request in the Tribal Listening Session for an extension to submit additional comments on the Draft EIS. DOE welcomes any additional comments you would like to provide and we are willing to work with your schedule. Would a two-week extension be sufficient for your needs with additional comments due May 6, 2024 at 11:59 p.m. ET? If more time is needed, we will consider your comments to the extent practicable while doing our best to maintain project schedule. Please reach out to us if you have any further questions or would like to discuss on a call. We look forward to working with you.
>
> James Lovejoy
>
> Department of Energy- Idaho Operations Office
>
> NEPA Document Manager
>
> [redacted]
>
> 208 526-4519 off

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Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

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Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

May 6th, 2024

Mr. James Lovejoy
DOE EIS Document Manager
U.S. Department of Energy, Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415
Submitted via email: HALEU-EIS@nuclear.energy.gov

Dear Mr. Lovejoy,

Thank you for the opportunity to submit comments on the Department of Energy's (DOE) Draft Environmental Impact Statement (DEIS) for DOE Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU). These comments are submitted by The Anishinabek Caucus of the Democratic Party of Michigan on behalf of our membership which includes Tribal members and leaders in our communities here in Michigan.

The purposes of the Anishinaabek Caucus are to promote the interests and concerns of the Anishinaabek people and to elect Anishinaabek Democrats and allies. We will support and encourage Anishinaabek candidates and allies at all levels of government; to recruit, train, support and elect Anishinaabek Democrats. We are from Sovereign Nations with air, land, and water resources directly impacted by different forms of pollution, including the nuclear fuel cycle.

On behalf of our members, we urge you to choose the **"No Action Alternative"** to forgo the acquisition of HALEU.

DOE Must Consider Tribal Sovereignty and Safety

The State of Michigan occupies the ancestral, traditional, and contemporary lands of the Anishinaabek – Three Fires Confederacy, the Odawa (Ottawa), Ojibwe (Chippewa), and Bodewadmi (Potawatomi). The Michigan Democratic Party recognizes historic Indigenous communities in Michigan and those forcibly removed from their homelands. We, The Caucus, further recognize the ongoing relationship of dependence upon, and respect for, all living beings of earth, sky, and water. We affirm Indigenous sovereignty, history, and experiences and have a right to be at the table for things that impact our futures.

Indigenous and local communities have organized for years against the environmental and health disparities caused by the Nuclear Fuel Chain across Turtle Island and here in Michigan. Around 100,000 tons of spent fuel are now in degrading waste pools stored at nuclear facilities along the Great Lakes shores, threatening local residents and ecosystems. It is imperative that the Department of Energy (DOE) include tribal and impacted community solutions, answer our questions and make changes accordingly with this that is being considered. Especially changes that would subsidize or expand the use of old or new nuclear power as well as open and expand domestic uranium mining that would negatively harm and impact our tribal lands and communities.

220-2

220-2 DOE is committed to considering Tribal concerns. Please see response to Comment 056-3 of this CRD and Section 1.3.1 of the EIS for specifics of DOE's outreach efforts and opportunities for participation, including for Tribes, in the NEPA process. DOE acknowledges your opposition to the Proposed Action. Thank you for participating in the EIS process. Please see the discussion in Section 2.1, "Support and Opposition," of this CRD for additional information.

Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

We are writing to express our strong opposition to the acquisition of HALEU as outlined in the DOE DEIS. The acquisition of HALEU not only goes against Tribal Sovereignty and Safety, but it also poses significant risks to public health, safety, and the environment. *220-2 (cont'd)*

DOE must consider Tribal Community & Environmental Justice Impacts of Its Funding

Nuclear energy is not clean or carbon-free. The nuclear fuel chain is responsible for carbon emissions during mining, milling, enriching, construction, transportation, and decommissioning. Nuclear energy generates pollution with well-documented negative health impacts in nearby communities, including cancer, and creates the risk of a nuclear disaster in Michigan on the scale of Chernobyl or Fukushima. Uranium mines, nuclear waste dumps, toxic incinerators, atomic reactors, and other such facilities typically are located where there is cheap land, cheap facilities, and little organized opposition. Too often, this has been in Black, Indigenous, People of Color, and low-wealth communities who have felt powerless to oppose corporate giants.

It is also our understanding that the Justice 40 funds do not address uranium issues (including fuel chain), which it must. The risks involved to communities that have already seen devastating environmental impacts cannot be ignored. Nuclear power is not safe, and it cannot be a part of an environmentally Just Transition from fossil fuels. Communities that have seen the harmful and devastating effects of pollution and climate change, including decreased life expectancy, worse health outcomes and a lack of access to safe, pollution free lands and waters, must be at the forefront when the nuclear fuel chain is being discussed and decided upon. *220-3*

We call on the DOE to listen to, engage with, and respect the voices of these communities as they work towards legislation to address our shared climate and environmental crisis.DOE must not move forward with funding new and expanded facilities to perpetuate these issues without first addressing the legacy impacts of past funding and actions that have harmed communities throughout the United States.

Needs an analysis to be included on how much more intensive than mining for lower enriched fuel

We are opposed to further subsidies from DOE for nuclear energy, including acquiring or supporting nuclear fuel production or enrichment. Our communities already bear the burdens of past subsidies, including environmental resource damage from royalty-free uranium mining under the 1872 Mining Law, lack of adequate financial assurance for mining and milling operations that leave sites orphaned, and health and safety impacts. DOE must consider the full life cycle impacts of its proposal, including the negative impacts of additional uranium mining and milling, transportation of fuels, and waste disposal. *220-4* *220-5*

There are numerous reports citing the levels of enrichment to above even 20 percent. The amount of uranium needed will be more per generation capacity. If the idea is to eventually have fleets of small modular nuclear reactors deployed to produce the same amount of energy as the reactors do now, the amount of uranium needed and waste produced would be 3-7 times as much as we have used and see now. We see this as a multiplier on how much our earth is *220-6*

220-3 Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. The Purpose and Need (Section 1.1 of the HALEU EIS) cites an *Organization for Economic Cooperation and Development - International Energy Agency* report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). The Final EIS addresses GHG in Section 4.3.2.

The DOE is committed to strengthening Tribal sovereignty and self-governance, and understands that fulfilling Federal trust and treaty responsibilities to Tribal Nations along with robust and meaningful consultations are the cornerstones of Federal Indian policy. DOE contacted all Federally Recognized Tribes through formal letters and hosted three Tribal listening sessions to determine Tribal concerns about the Proposed Action. Additional notifications were also sent via Tribal newspapers/ newsletters, email notifications, and social media to solicit Tribal input throughout the comment period. DOE received two government-to-government consultation requests from the Morongo Band of Mission Indians and from the Agua Caliente Band of Cahuilla Indians. Please see Section 6.1, "Consultations," of the Final EIS for additional information about Tribal consultation. DOE remains open to additional government-to-government consultation requests.

The Final EIS has been updated to clearly indicate environmental justice impacts (in Vol. 1 Sections 3.1.11 and 3.3.8; Vol. 2 Sections A.1.3.11 and A.3.3.7) and outreach discussions (in Sections 1.2 and 1.3). The environmental justice impacts were evaluated to the extent practicable based on existing analysis for sites, and surrogates for others, to allow SMEs to predict the potential impacts of the Proposed Action. In addition, links are provided throughout these sections to the appropriate portions of Appendix A and the referenced Technical Report (Leidos, 2023) for the detailed analysis.

In this EIS, DOE has acknowledged that past uranium fuel cycle activities have resulted in long lasting, legacy issues. Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. Unrelated to the Proposed Action, DOE's Office of Legacy Management (https://www.energy.gov/lm/office-legacy-management) was established to fulfill the DOE's post-closure responsibilities and ensure the future protection of human health and the environment. In addressing its mission, the Office of Legacy Management functions to protect human health

Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

harmed by mining and the threat of more waste. We oppose the acquisition of HALEU and ask for the No Action Alternative. *220-6 (cont'd)*

Nuclear Power is Not Viable Without Permanent Waste Disposal

DOE must acknowledge that there is no permanent disposal facility for nuclear waste in the U.S. and until such a facility exists new nuclear power plants are unwise. We strongly believe that our nation shouldn't be creating new nuclear waste by subsidizing nuclear power when we have no place to safely and permanently store the waste that already exists. *220-7*

Nuclear Power is Not a Solution to Climate Change

DOE bases its proposal in part on the false premise that new nuclear power, including nuclear power generated with HALEU, is necessary to abate the harm of climate change. However, new nuclear power plants take years - or decades - to design and build, and they simply won't come online fast enough to address climate change or other environmental issues related to energy production. As part of its environmental impacts analysis, the DOE should consider the full opportunity cost of spending taxpayer dollars on HALEU as opposed to other projects DOE could be supporting, such as renewable energy research & development - projects that would be able to be deployed in a short time frame to be a cost-effective solution to climate change. *220-8*

Indigenous Lifeways and Indigenous Knowledge are solutions and have a right to be at the table. We oppose this proposal because Traditional Ecological Indigenous knowledge and lifeways as solutions are not included and for that reason we pursue the Path of the No Action Alternative

Taxpayers and Our Communities Should Not Bear the Cost & Risk of HALEU Production

We ask the DOE to disclose the total amount of taxpayer money that will be spent as direct subsidies to companies or spent by DOE itself for administrative and operational costs of the program. Please also discuss and disclose how this spending will contribute to the national debt. DOE must disclose the true cost of subsidizing the nuclear fuel cycle. *220-4 (cont'd)*

In short, our organizations oppose this proposed DOE action because companies building new nuclear power plants should bear the risks and costs just like any other industry. The federal government shouldn't subsidize this industry with more taxpayer dollars. Please issue a much-revised DEIS for public review and comment and select the No Action Alternative moving forward.

In Closing,

HALEU is a highly enriched uranium material that could be used to fuel advanced nuclear reactors, leading to increased proliferation risks and nuclear weapons development. The production, transportation, and storage of HALEU present serious safety concerns, including the risk of accidents, radioactive contamination, and potential terrorist threats. It goes against our Traditional values. *220-9*

and the environment through effective and efficient long-term surveillance and maintenance; preserve, protect and make accessible legacy records and information; support an effective and efficient workforce structured to accomplish departmental missions; implement departmental policy concerning continuity of worker pension and medical benefits; manage legacy land and assets, emphasizing safety, reuse, and disposition; mitigate community impacts resulting from the cleanup of legacy waste and changing departmental missions; actively act as liaison and coordinate all policy issues with appropriate departmental organizations. The efforts associated with the Proposed Action are independent of the efforts to address legacy issues. Any action DOE takes to implement the Proposed Action would not impact the efforts DOE or other regulatory bodies are taking to address legacy issues associated with defense and commercial uranium production. Please also reference Section 2.4, "Legacy Issues," of this CRD for more information.

Environmental justice is discussed in multiple sections of Chapter 3, *Impacts* (e.g., Sections 3.1.11 and 3.3.8), and new sections were added to Volume 2 (Sections A.1.3.11 and A.3.3.7). These sections provide information on communities with environmental justice concerns based on select locations of current facilities, reviewing past NEPA documents, and updating U.S. Census data for block groups, cities, counties, and states. With no specific sites identified, environmental justice analysis varied according to the type of activity (e.g., mining and milling, enrichment, etc.) and the available information from existing NEPA documents. Environmental justice impacts were considered to the extent possible given that there are no specific site locations for the HALEU fuel cycle activities (and the ROD will not specify specific sites). Once a site or facility has been selected, specific impacts may be assessed in future NEPA review by the relevant regulatory authority (e.g., NRC). To determine cumulative burdens, DOE's Energy Justice Mapping Tool – Disadvantaged Communities Reporter was also used to identify areas as disadvantaged. For further information about the EJ analysis and updates in this Final EIS, please see DOE's response to Comments 056-13 and 056-28.

220-4 DOE acknowledges your opposition to the Proposed Action and support for the No Action Alternative. In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. See Section 1.1. of the EIS and Section 2.2, "Purpose and Need," of the CRD for additional information. Regarding costs, DOE has issued two separate Requests

Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

Furthermore, the acquisition of HALEU perpetuates our reliance on outdated and dangerous nuclear technology, diverting resources away from cleaner, safer, and more sustainable energy alternatives such as renewable energy sources and energy efficiency measures. Investing in nuclear power undermines efforts to address climate change and transition to a truly sustainable energy future.

220-8 (cont'd)

Many Migwetches,
Jesse Deer In Water
Anishinabek Caucus

Andrea Pierce Chair | **Dr. Kyle Whyte** Vice-Chair | **Julie Dye** Secretary | **Nancy Morehead** Treasurer

Eva Menafee Designated Bookkeeper

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for Proposal (RFPs) to address enrichment and deconversion activities related to the production of HALEU. See the HALEU Enrichment Acquisition RFP (https://sam.gov/opp/11ff0842638849558f2ae917975b1f28/view) and the HALEU Deconversion Services RFP (https://sam.gov/opp/bfa371842550469bb22d718d5a06b715/view) for additional information about the RFP process. Please see the discussion in Sections 2.1, "Support and Opposition," and 2.8, "Out of Scope," of this CRD for additional information.

220-5 In the EIS, DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues, particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, especially on Tribal communities, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. The assessments of impacts for the Proposed Action focus on the potential impact of future operations under the current regulatory regime. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices. For additional information see Section 2.4, "Legacy Issues," of this CRD. Provisions for financial compensation from past activities is not within the scope of this EIS.

The EIS also analyzes all aspects of the Proposed Action from mining and milling, conversion, enrichment, deconversion, storage of HALEU and transportation between facilities as part of the Proposed Action. The impacts of these activities are addressed in Appendix A, Sections 3.1 through 3.6 of Volume 1, and summarized in Section 2.6.1 of Volume 1. The EIS also addresses the impacts of related post Proposed Action activities, including fuel fabrication, use of fuel in advanced reactors, and fuel management, in Section 3.7. Also see the Technical Report (Leidos, 2023) for additional information. Chapter 1 of the Technical Report considers impacts from ISR, conventional mining and milling. Chapter 6 considers Human Health - Transportation Impacts. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report (Leidos, 2023) which discuss small impacts in detail. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

220-6 DOE reviewed existing information regarding mining and milling locations including NRC databases. The information includes existing permitted mines and licensed milling facilities. Some of these facilities have been inactive (on standby) for decades. The scope of the EIS is not to select specific locations for HALEU activities, rather provide a range of potential impacts using the best available data and information, primarily past NEPA documentation. DOE has reviewed the information and made applicable changes to Figure 2.1-1 in the EIS. Please refer to the Technical Report (Leidos, 2023) for a detailed discussion regarding assessment of impacts for mining and milling activities. The Final EIS has been updated to include specific hot links to the appropriate section of the Technical Report.

220-7 In the Energy Act of 2020, Congress directed DOE to establish and carry out, through DOE's Office of Nuclear Energy, a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use and make such HALEU available to members of a DOE HALEU consortium by January 1, 2026. The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. DOE acknowledges that there is currently no permanent waste repository. However, the HALEU SNF that could be generated because of the HALEU Proposed Action over multiple years of reactor operation would contain a total of approximately 290 MT of HALEU. This is 0.4% of the 86,584 MT heavy metal of SNF in inventory in the United States in 2021 (DOE, 2021, p. 2). Therefore, the HALEU SNF generated by the activities related to the Proposed Action would not substantially add to the overall impacts of managing the nation's inventory of SNF. As described in Section 2.1.7.3, "HALEU Spent Nuclear Fuel Storage and Disposition," HALEU SNF on-site storage is assumed to occur at the reactor generating the SNF. Off-site storage and disposition are assumed to occur at the future facilities that would be used for consolidated storage and disposition of the much larger quantity of existing commercial power reactor SNF. As discussed in Section 3.7.3.1, "Storage of Spent Nuclear Fuel at the Reactor," at-reactor storage of SNF would have SMALL impacts for most resource areas, but there is the potential for MODERATE to LARGE impacts on special status species and habitat, historic and cultural resources, and from nonradioactive waste management. Interim HALEU SNF storage at the reactor sites is possible. The ultimate disposition of SNF is dependent upon the licensing (no facility is currently in the licensing process) of a permanent repository. SNF storage and disposition is discussed in more detail in Appendix A, *Environmental Consequences Supporting Information*. For a full analysis of potential impacts, including SMALL impacts, see the incorporated NEPA documents listed in Appendix A, Section A.7.3.1.2, "Existing NEPA Documentation." This HALEU EIS does not anticipate the Proposed Action would require or result in the construction of additional SNF storage or disposal

Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

capacity. Because the HALEU SNF expected to be generated under the Proposed Action would be a small addition to existing commercial power reactor SNF, the HALEU SNF would not substantially contribute to cumulative impacts of managing the nation's inventory of SNF. The ultimate disposition of SNF is dependent upon the licensing of a permanent repository. DOE remains committed to meeting its obligations under the Nuclear Waste Policy Act to dispose of SNF. While outside the scope of this program, DOE is currently facilitating an ongoing consent-based siting effort specific to the management of spent nuclear fuel and federal consolidated interim storage. In the interim, SNF is being safely stored at more than 70 reactor sites across the country. SNF storage and disposition is discussed in more detail in Vol. 2, Appendix A, *Environmental Consequences Supporting Information*. Also, please refer to Section 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal," of this CRD for a discussion of this topic and DOE's response.

220-8 The purpose of the Proposed Action is to fulfill Congressional direction in Section 2001(a)(2)(D)(v) of the Energy Act and to facilitate the development of a domestic HALEU fuel cycle through procurement of HALEU. Agency action is needed to create a supply of HALEU fuel to power advanced reactors. Many advanced reactors are intended to operate using HALEU fuel, but there is currently not sufficient domestic supply of HALEU for these reactors. Promoting alternative power systems as mentioned by the commenter, would not meet the Purpose and Need (See Section 2.2, "Purpose and Need," of this CRD) identified in the HALEU EIS. None would facilitate the commercialization of a HALEU fuel cycle. Therefore, supporting such activities is not a reasonable alternative within the scope of the HALEU EIS. Please also see the discussion in Section 2.8, "Out of Scope," of this CRD for additional information on why renewable energy does not meet the purpose and need of the Proposed Action. It should be noted that other programs within DOE and other Federal agencies are supporting renewable energy initiatives. As for the costs of the Proposed Action, Congress has directed DOE to establish and carry out a program to support the availability of HALEU and has appropriated money specifically for HALEU. Nuclear power can be one of the technologies employed to address carbon emission reduction and climate change. It can be put into production in time to help with eliminating fossil fuel use and the associated carbon dioxide emissions. (Reductions in carbon dioxide emissions from implementation of the Proposed Action are discussed in Section 4.3.2 and summarized in Section 2.7.2 of the HALEU EIS.) Many carbon emission goals are targeted to the year 2050, more than two decades from now. Nuclear could contribute to the reduction in carbon emissions by then. The Purpose and Need (Section 1.1 of the HALEU EIS) identifies projected demand for HALEU through 2050. this section of the EIS also cites an *Organization for Economic Cooperation and Development - International*

Commenter No. 220 (cont'd): Jesse Deer In Water Anishinabek Caucus

Energy Agency report that identifies nuclear as playing a significant role in reducing carbon emissions between now and 2050. This is based on multiple nuclear reactors coming on line (producing power for commercial electric needs). Please also see Section 2.1 of the CRD "Support and Opposition" for further information. DOE acknowledges the impacts from prior fuel cycle activities, both defense and civilian. However, DOE believes that future fuel cycle activities can be carried out in a manner that limits the impact to both the environment and human health. For additional information see Section 2.4, "Legacy Issues," of this CRD Some people are concerned that the very small radioactive releases from nuclear power plant operation could affect health in communities around nuclear facilities. However, facility operators must follow NRC regulations by closely monitoring and controlling these releases to meet very strict radiation dose limits. The plants also must publicly report them to the agency.

220-9 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Sections 2.3, "Nonproliferation and Terrorism"; 2.5, "Radioactive Waste and Spent Nuclear Fuel Management and Disposal"; and 2.6, "Transportation," of this CRD for a discussion of these topics of interest and DOE's response for each topic.

Commenter No. 221: Timothy Wilcox, Agua Caliente Band of Cahuilla Indians

From: THPO Consulting
To: HALEU-EIS
Subject: [EXTERNAL] High-Assay Low-Enriched Uranium (HALEU)
Date: Tuesday, May 7, 2024 12:07:09 AM
Attachments: 01-027-2024-001ACBCI.pdf

Good evening Mr Lovejoy and the DOE,

If you have any questions about the attached letter please feel free to contact me.

Thank you,

Timothy Wilcox
Tribal Archaeologist
[redacted] | D: (760) 699-6958
5401 Dinah Shore Drive, Palm Springs, CA 92264

Response side of this page intentionally left blank.

Commenter No. 221 (cont'd): Timothy Wilcox
Agua Caliente Band of Cahuilla Indians

AGUA CALIENTE BAND OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION

01-027-2024-001

[VIA EMAIL TO:HALEU-EIS@nuclear.energy.gov]
Department of Energy
Mr. James Lovejoy
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415

Re: High-Assay Low-Enriched Uranium (HALEU)

Dear Mr. James Lovejoy,

The Agua Caliente Band of Cahuilla Indians (ACBCI) appreciates your efforts to include the Tribal Historic Preservation Office (THPO) in the High-Assay Low-Enriched Uranium (HALEU) project. We have reviewed the documents and have the following comments:

*Formal government to government consultation under Section 106 of the National Historic Preservation Act with the lead agency. *221-1*

*Tribes have a horrific history with Uranium mining and Milling. The only operation mill is next to the white Mesa community of the Ute Mountain Ute Reservation. Uranium mining has left my own tribe, the Navajo Nation, with a lasting mar on the land and the people. There are portions of the Navajo Nation where as a young archaeologist I had to survey open pit uranium mines left as is when mining companies left exposed in their exit from the reservation. As that young archaeologist, I was on a crew that surveyed the open Uranium mines so that they could be reclaimed. You see the mines were over 50 years old and considered historic properties under the National register, 50 years open in these Southwestern Navajo Nation communities. Children still have health issues from the legacy of uranium mining as well as Nuclear tests in Nevada. *221-2*

*Even though the uranium booms are over and there are no active mines, recent mining near the Grand Canyon put transportation routes through the Navajo Nation. So, this history is still in our recent memory as it is still threatening our communities. *221-3*

*For the Agua Caliente band of Cahuilla Indians, Transportation would likely be of concern to them as Interstate 10 in California runs through their reservation lands. *221-4*

*It seems the DOE is minimizing the potential affects. *221-5*

*Commercialization brings greed into the equation, and Native communities pay the price. *221-6*

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T 760/699/6800 F 760/699/6924 WWW.AGUACALIENTE-NSN.GOV

221-1 While DOE understands and shares your interest in preserving historic and cultural resources, the EIS does not analyze site-specific locations, and therefore DOE is not pursuing activities that are ripe for Section 106 Consultation. DOE is available for government-to-government consultation. As additional information is developed and locations for potential actions are identified, DOE expects that other Federal agencies will be involved in authorization of the HALEU activities and will have obligations to comply with applicable environmental and Section 106 review and consultation requirements. DOE expects to coordinate, as necessary and appropriate, with other Federal agencies. In the meantime, DOE continues to encourage Tribal participation and remains available for government-to-government consultations consistent with our trust responsibilities.

221-2 DOE acknowledges the occurrence of legacy contamination that has occurred from past uranium recovery and enrichment activities and your concerns. Please refer to Sections 3.1, "Uranium Mining and Milling" in Vol. 1 of the Final EIS and 1.3, "Affected Environment and Environmental Consequences," of the Technical Report for further information on potential mining and milling impacts by resource. Please see Section 2.4, "Legacy Issues," of the CRD for additional information, Section A.1.3.12, a discussion of mining and milling legacy issues, has also been added to Volume 2 of the EIS.

221-3 DOE acknowledges that past uranium fuel cycle activities have resulted in long lasting, legacy issues particularly to Tribes. (Section A.1.3.12 discussing mining and milling legacy issues has been added to Volume 2 of the EIS.) Mining and milling operations have in particular resulted in mill tailing piles which can result in both airborne and surface water releases if not properly contained. Groundwater contamination has also been observed as a result of mining and milling operations. Many epidemiological and health studies have been conducted, with varying results as to the potential health impacts from these legacy wastes. While DOE understands the historic impacts of the uranium industry, past fuel cycle activities were conducted under a different regulatory regime that is not representative of current and future facility construction, operation, and decommissioning. Current requirements for licensing, permitting, and monitoring of the fuel cycle facilities are generally much more stringent than historic practices.

For additional information see Section 2.4, "Legacy Issues," of this CRD.

221-4 See the response to Comment 118-3.

221-5 Changes were made throughout the Final EIS to improve introduction, discussion, and linking to the Appendix A and the Technical Report, which should help explain how DOE substantiated the impacts conclusions reported in the Summary and Chapter 2 tables. Environmental impact methods and discussions are first

Commenter No. 221 (cont'd): Timothy Wilcox
Agua Caliente Band of Cahuilla Indians

AGUA CALIENTE BAND OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION

01-027-2024-001

*What about proliferation with the need for 4 times as much Uranium to produce HELAU

*Many of the existing facilities in the west mentioned by this EIS are adjacent to Tribal lands and communities, a reminder of that history

*In the information session a few weeks ago, the DOE said tribes would need to check their website for updates. The DOE should know that Tribes have varied capacities to do that. Some are short staffed, some don't even have internet access, and even well-staffed Tribes are overwhelmed by the shear amount of consultations

Again, the Agua Caliente appreciates your interest in our cultural heritage. If you have questions or require additional information, please call me at (760) 699-6958. You may also email me at ACBCI-THPO@aguacaliente.net.

Cordially,

Timothy Wilcox
Archaeologist
Tribal Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

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221-7

221-6 (cont'd)

221-8

presented in Chapter 3, then Appendix A, and ultimately the Technical Report. Many of the existing or ongoing NEPA evaluations were or are being prepared under the NRC implementing regulations and requirements. The NRC has been using and continues to use the defined impact assessment categories to characterize the potential environmental consequences. As discussed in Appendix A, the potential environmental consequences associated with construction and operation of uranium fuel cycle facilities in the existing NEPA evaluations were evaluated by the authors of this EIS. The authors, who are subject matter experts (SMEs) in their respective fields, used their education, working knowledge, experience, and professional judgement to estimate the potential environmental consequences associated with the Proposed Action. In general, the Proposed Action represents a smaller scale level of activity and footprint compared to the activities and footprints evaluated in the existing NEPA evaluations. For example, the requirements for HALEU commercialization would be about 20 percent of the conversion capacity of the Metropolis facility. In addition HALEU enrichment would require 1.1 million separative work units (SWUs) per year, which is 37% of the capacity of UUSA of 3 million SWUs. The relatively smaller scale was factored into the SMEs' evaluations and reflected in the impact assessment categories identified in this EIS. Similarly, expansion of ISR or conventional mining operations in existing permitted locations already contain existing infrastructure and similar activities/impacts compared to the activities and footprints evaluated in the existing NEPA evaluations (often evaluating an entirely new facility). Changes in regulations or industry standard practices for reducing or eliminating potential for impact also factor into smaller scale impacts than those determined in previous (earlier) NEPA evaluation. Please reference Section 2.4, "Legacy Issues," of this CRD for further discussion regarding legacy impacts.

221-6 The Final EIS has been updated to clearly indicate environmental justice impacts (in Sections 3.1.11, 3.3.8, A.1.3.11, and A.3.3.7) and outreach discussions (in Sections 1.2 and 1.3). DOE is and remains open to government-to-government consultation requests. In the absence of specific site locations, DOE notified all federally recognized Tribes of these listening sessions through formal Tribal letters and emails. These notifications communicated to Tribal leaders the availability of the Draft EIS, the mechanisms to submit comments, opportunities to initiate government-to-government consultation, as well as provided information about the three Tribal Listening Sessions. The goals of the Tribal Listening Sessions were to determine Tribal concerns, address any questions about the Proposed Action, and formally receive Tribal comments on the Draft EIS. Please also see Section 1.3.1 of the EIS for additional information on DOE's public outreach, including to Tribes.

221-7 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges

Commenter No. 221 (cont'd): Timothy Wilcox
Agua Caliente Band of Cahuilla Indians

than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

221-8 Thank you for sharing this perspective. The Tribal Listening Sessions were specifically implemented to listen to Tribal perspectives so DOE could more meaningfully consider Tribal concerns and engage with Tribes. Going forward the Office of Nuclear Energy will take into consideration different and more accessible mechanisms when notifying not only Tribal governments, but also Tribal communities.

Commenter No. 222: Tom Clements, Savannah River Site Watch

From: HALEU-EIS
To: Lawson, Miranda N. [US-US]
Cc: Lovejoy, James B
Subject: EXTERNAL: FW: [EXTERNAL] Comment for draft HALEU EIS - Science magazine article on "The weapons potential of high-assay low-enriched uranium"
Date: Tuesday, June 11, 2024 6:41:30 AM
Attachments: Weapons Potential of HALEU (final, 6 June 2024).pdf

e-mail from Friday the 7th.

From: Tom Clements <tomclements329@cs.com>
Sent: Friday, June 7, 2024 11:40 AM
To: HALEU-EIS <haleu-eis@nuclear.energy.gov>
Cc: james.lovejoy@inl.gov
Subject: [EXTERNAL] Comment for draft HALEU EIS - Science magazine article on "The weapons potential of high-assay low-enriched uranium"

Comment for the record of the *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) (Draft HALEU EIS) (DOE/EIS–0559).*

Though this submission is late, given the importance of the proliferation issue at hand, I hereby request it be considered in preparation of the final EIS on HALEU production.

Attached you will find an article in Science magazine on June 6, 2024:

The weapons potential of high-assay low-enriched uranium

Recent promotion of new reactor technologies appears to disregard decades-old concerns about nuclear proliferation

I request that this article be considered in preparation of the EIS. The article concludes:

Given the stakes, we recommend that the US Congress direct the DOE's National Nuclear Security Administration to commission a fresh review of HALEU proliferation and security risks by US weapons laboratory experts. This study should take into consideration advancements in modeling simulation, and nuclear-explosive engineering that have emerged since the AEC's 1966 study. A 2023 study by the US National Academies of Science, Engineering, and Medicine (NASEM) on the merits of different reactor and fuel cycle concepts

222-1

222-1 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 222 (cont'd): Tom Clements, Savannah River Site Watch

made a similar recommendation regarding the utilization of HALEU. Given the large number of private corporations now counting on HALEU and the enormous sums flowing through the DOE to support a HALEU ecosystem, the DOE is not free of conflicts of interest. We therefore further recommend that the proposed study be peer reviewed by an independent body with the necessary technical expertise and security clearances. The NASEM or the JASON group of technical consultants, having a history of credible work regarding weapons and proliferation, could conduct such a review and provide an unclassified summary for policymakers. The matter is urgent because industry needs to know sooner rather than later the true security risks to avoid designing reactors that could be sources of nuclear weapons material.

A key outcome of this study should be to set a new, technically justified, and lower enrichment limit for weapons-usable uranium. According to the information available now, a reasonable balance of the risks and benefits would be struck if enrichments for power reactor fuels were restricted to <10 to 12% 235U. If higher enrichments continue to be used, securityrelevant quantities should be subject to appropriate physical protection. At present, the highest security classification of HALEU under both US and international standards is Category II, which has as a protection objective the early detection of theft. Security-relevant quantities of HALEU should be recategorized as Category I material, which requires the prevention of theft and is the standard used for analogous quantities of weapons-usable HEU and plutonium. A 10 to 12% threshold for Category I protection would allow many reactor designs to move forward with only modest economic consequences

The decision on how to handle HALEU domestically has crucial downstream

222-1 (cont'd)

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Commenter No. 222 (cont'd): Tom Clements, Savannah River Site Watch

consequences for global security. Were HALEU to become a standard reactor fuel without appropriate restrictions determined by an interagency security review, other countries would be able to obtain, produce, and process weapons-usable HALEU with impunity, eliminating the sharp distinction between peaceful and nonpeaceful nuclear programs. Such countries would be only days away from a bomb, giving the international community no warning of forthcoming nuclear proliferation and virtually no opportunity to prevent it. An unfettered HALEU policy leaves no margin of safety.

222-1 (cont'd)

Thank you for reviewing the article and responding in the EIS to points raised in it, especially concerning a peer-reviewed study on the proliferation impacts associated with HALEU production and utilization.

I request this comment and the attached article be made part of the EIS record.

Additionally, apart from the preparation of the EIS, the article should be circulated to those working on the HALEU project.

Tom Clements
SRS Watch
Columbia, SC

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This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.
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Commenter No. 222 (cont'd): Tom Clements, Savannah River Site Watch

EMBARGOED UNTIL 2:00 PM ET THURSDAY 6 JUNE 2024

POLICY FORUM

NUCLEAR SECURITY

The weapons potential of high-assay low-enriched uranium

Recent promotion of new reactor technologies appears to disregard decades-old concerns about nuclear proliferation

By R. Scott Kemp[1], Edwin S. Lyman[2], Mark R. Deinert[3], Richard L. Garwin[4], Frank N. von Hippel[5]

Preventing the proliferation of nuclear weapons has been a major thrust of international policymaking for more than 70 years. Now, an explosion of interest in a nuclear reactor fuel called high-assay low-enriched uranium (HALEU), spurred by billions of dollars in US government funding, threatens to undermine that system of control. HALEU contains between 10 and 20% of the isotope uranium-235. At 20% ^{235}U and above, the isotopic mixture is called highly enriched uranium (HEU) and is internationally recognized as being directly usable in nuclear weapons. However, the practical limit for weapons lies below the 20% HALEU-HEU threshold. Governments and others promoting the use of HALEU have not carefully considered the potential proliferation and terrorism risks that the wide adoption of this fuel creates.

Commercial reactor fuels typically have low enrichments, in the range of 3 to 5% ^{235}U. At these enrichments, the fuel cannot sustain an explosive chain reaction. This has prevented nations or terrorists from simply repurposing commercial reactor fuel for weapons. Above around 6% ^{235}U, the fuel can sustain a fast chain reaction at normal density, but the mass needed for a weapon would be prohibitively large. Producing fuel with higher ^{235}U concentrations reduces the mass needed for a weapon to practical levels, but doing so requires enrichment capabilities that are controlled by only a small handful of countries. This arrangement effectively blocks most nations from modifying fresh nuclear reactor fuel to make weapons.

> **"...computational tools that facilitate weapons design have spread around the world, placing greater importance on controlling nuclear materials..."**

For technical reasons, the traditional 3 to 5% fuel will not suffice for many of the power reactor designs that nuclear engineers want to build today. For example, proposed microsized reactors are so inefficient with their neutrons that they need HALEU simply to turn on. Most designers favor 19.75% ^{235}U HALEU—on the cusp of HEU—because more ^{235}U almost always eases constraints, but use of HEU is discouraged because of its clear weapons potential. In many designs, the amount of HALEU needed is hundreds to thousands of kilograms, which may mean that a single reactor contains enough HALEU to make a nuclear weapon. If this is the case, commercializing HALEU fuels without ensuring that the material is appropriately protected against diversion by national governments or theft by terrorists would pose a serious threat to security.

In 1954, the US government's weapons laboratory at Los Alamos performed studies to assess the weapons utility of uranium of various enrichments (*1*). The issue at the time was the proliferation potential of proposed exports of research reactors to foreign nations under the Atoms for Peace program. Using the information from Los Alamos, the US Atomic Energy Commission (AEC) concluded that fuels enriched to <10% ^{235}U were not weapons usable, regardless of the quantity. However, between 10 and 20% ^{235}U, the materials were of "weapon significance" and could be used in a nuclear weapon if available in sufficient quantity. On the basis of this assessment, the AEC allowed uranium exports of up to 20% ^{235}U—in part because it was concerned about the higher cost of reactors using fuel with lower enrichments—provided that the quantities were below the threshold of weapon significance.

In the mid-1960s, the AEC organized a new study to establish a technical basis for domestic nuclear material accountancy and security requirements (*2*). This ultimately led the agency to develop security rules for domestic users that contained an exemption for any quantity of uranium enriched below 20% ^{235}U. In 1979, a 20% lower limit on the enrichment of uranium considered to be weapons usable was adopted by the US Nuclear Regulatory Commission (NRC) in its rule on physical protection.

Why the AEC, and later the NRC, issued regulations that appear to disregard the findings related to HALEU from the original Los Alamos weapons laboratory study is unclear because the details remain classified. However, in 1984, J. Carson Mark, head of the Los Alamos Theoretical Division responsible for designing nuclear weapons from 1943 until 1973, confirmed in congressional testimony that HALEU was weapons usable down to 10% ^{235}U (*3*).

Several factors appear relevant to the creation of the loophole for HALEU. Historically, HALEU was only rarely used and limited mainly to research reactors. It would not have been practical to make a weapon from the small quantities used in a single research reactor, and regulators held that it was implausible that simultaneous thefts from multiple research reactors would occur. It was also the case that the AEC's perspective on safeguards was established by a panel of industry representatives who believed that the future would be powered by nuclear reactors fueled with plutonium (*4*). In such a world, the additional risk from HALEU might have seemed insignificant because plutonium is a much more attractive bomb material. However, that world never emerged. The geological abundance of uranium turned out to be more than originally predicted, and uranium's considerably more-favorable economics won the day.

Over the past few decades, the situation has evolved. Information and computational tools that facilitate weapons design have spread around the world, placing

[1]Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA. [2]Union of Concerned Scientists, Washington, DC, USA. [3]Nuclear Science and Engineering Program, Department of Mechanical Engineering, Colorado School of Mines, Golden, CO, USA. [4]IBM Thomas J. Watson Research Center, Yorktown Heights, NY, USA. [5]Program on Science and Global Security, Princeton University, Princeton, NJ, USA. Email: rsk@mit.edu

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Commenter No. 222 (cont'd): Tom Clements, Savannah River Site Watch

greater importance on controlling nuclear materials that were previously viewed as being of marginal utility. This, combined with recent proposals for increasing the use of HALEU in quantities that far exceed those required in the past, means that the time has come to review policies governing the use of this material.

The weapons potential of HALEU can be examined using the Serber-Bethe-Feynman formula (*5*). It relates the potential explosive yield to the spherical radius of an initial supercritical mass, the radius at which the mass becomes subcritical during explosive expansion, the rate of growth of the neutron chain reaction, and scaling constants with exact values that are determined from classified nuclear weapons tests but can be roughly approximated from the properties of unclassified systems. Although simple, the formula is famously reliable (*6*). Estimates of the inputs to the formula using a variety of open sources (including published critical mass and kinetics parameter data for different enrichments and core-reflector combinations) indicate that HALEU above about 12% ^{235}U could be used to make a practical weapon. These assessments indicate that quantities ranging from several hundred kilograms to about 1000 kg of 19.75% HALEU could produce explosive yields similar to or greater than that of the 15 kilotons of TNT equivalent bomb that the United States dropped on Hiroshima, Japan, at the end of World War II.

Designing such a weapon would not be without its challenges, but there do not appear to be any convincing reasons why it could not be done. The amount of nuclear material would be large compared with traditional weapons but not prohibitively so. Our extreme example of 1000 kg constitutes a metal ball with a diameter of 46 cm (18 inches). The neutron reflector and assembly mechanism would be added to this, but even so, the final size and weight might be acceptable if the weapon were delivered using an airplane, a delivery van, or a boat sailed into a city harbor.

A second challenge relates to a phenomenon called preinitiation, which could cause a substantial reduction in explosive yield. This occurs when neutrons emitted spontaneously by uranium-238, the dominant isotope in HALEU, initiate a nuclear chain reaction in the bomb core before the moment of maximum reactivity. This problem is much worse for reactor-grade plutonium, which has a spontaneous neutron emission rate about 300 times as high as that of 15% HALEU when scaled to the bare critical masses for the two materials. Even so, reactor-grade plutonium has been used successfully to make bombs (*7*), and the US Department of Energy (DOE) has said that: "At the lowest level of sophistication, a potential proliferating state or subnational group using designs and technologies no more sophisticated than those used in first-generation nuclear weapons could build a nuclear weapon from reactor-grade plutonium that would have an assured, reliable yield of one or a few kilotons (and a probable yield significantly higher than that)" [(*8*), p. 38]. This indicates that the preinitiation problems of HALEU can be overcome. Although preinitiation may have a bigger impact on some designs than others, even those that are sensitive to it could still produce devastating explosive power.

"Such countries would be only days away from a bomb, giving the international community no warning of forthcoming nuclear proliferation..."

If the weapons usability of HALEU is borne out, then even a single reactor would pose serious security concerns. Yet, the DOE and US Department of Defense are providing funds for more than 10 reactor concepts with cores containing from several hundreds to many thousands of kilograms of HALEU, including the Natrium reactor being developed by TerraPower, a company founded by Bill Gates (*9*).

The 20% statutory division between HALEU and HEU has been interpreted as the technical threshold between weapons-usable and -nonusable uranium by generations of nuclear professionals. There was therefore little concern when, in 2018, the US nuclear power industry's lobbying organization, the Nuclear Energy Institute (NEI), pushed the US government to make more than a hundred tons of HALEU available annually by late this decade (*10*). Congress responded in the 2020 Energy Act, directing the DOE to share HALEU with private companies. In October 2020, the DOE announced a 50% cost-sharing program, providing up to $4 billion in federal funds to two demonstration reactors that plan to use multiton quantities of HALEU

PHOTO: POPPERPHOTO/GETTY IMAGES

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Commenter No. 222 (cont'd): Tom Clements, Savannah River Site Watch

fuel. The Inflation Reduction Act of 2022 then appropriated $700 million to develop civilian supplies of HALEU, and Congress has since made available $2.72 billion more to subsidize the private production of LEU, including HALEU (*11*).

Now, other countries are starting to follow suit. The United Kingdom announced in January that it would be the first European nation to subsidize HALEU production (*12*), and France announced that it is looking into production options. Although the US NRC has recently determined that "Supplemental security measures…may be required to address the current threat environment and the changing understanding of the risks associated with [HALEU]" (*13*), to our knowledge, there has been no adequate evaluation of the risk to international security posed by HALEU in the quantities required by power reactors.

Given the stakes, we recommend that the US Congress direct the DOE's National Nuclear Security Administration to commission a fresh review of HALEU proliferation and security risks by US weapons laboratory experts. This study should take into consideration advancements in modeling, simulation, and nuclear-explosive engineering that have emerged since the AEC's 1966 study. A 2023 study by the US National Academies of Science, Engineering, and Medicine (NASEM) on the merits of different reactor and fuel cycle concepts made a similar recommendation regarding the utilization of HALEU (*9*). Given the large number of private corporations now counting on HALEU and the enormous sums flowing through the DOE to support a HALEU ecosystem, the DOE is not free of conflicts of interest. We therefore further recommend that the proposed study be peer reviewed by an independent body with the necessary technical expertise and security clearances. The NASEM or the JASON group (*14*) of technical consultants, having a history of credible work regarding weapons and proliferation, could conduct such a review and provide an unclassified summary for policymakers. The matter is urgent because industry needs to know sooner rather than later the true security risks to avoid designing reactors that could be sources of nuclear weapons material.

An Allied correspondent stands amid rubble and ruins in Hiroshima on 7 September 1945 after the dropping of an atomic bomb on 6 August.

A key outcome of this study should be to set a new, technically justified, and lower enrichment limit for weapons-usable uranium. According to the information available now, a reasonable balance of the risks and benefits would be struck if enrichments for power reactor fuels were restricted to <10 to 12% ^{235}U. If higher enrichments continue to be used, security-relevant quantities should be subject to appropriate physical protection. At present, the highest security classification of HALEU under both US and international standards is Category II, which has as a protection objective the early detection of theft. Security-relevant quantities of HALEU should be recategorized as Category I material, which requires the prevention of theft and is the standard used for analogous quantities of weapons-usable HEU and plutonium. A 10 to 12% threshold for Category I protection would allow many reactor designs to move forward with only modest economic consequences (*15*).

The decision on how to handle HALEU domestically has crucial downstream consequences for global security. Were HALEU to become a standard reactor fuel without appropriate restrictions determined by an interagency security review, other countries would be able to obtain, produce, and process weapons-usable HALEU with impunity, eliminating the sharp distinction between peaceful and nonpeaceful nuclear programs. Such countries would be only days away from a bomb, giving the international community no warning of forthcoming nuclear proliferation and virtually no opportunity to prevent it. An unfettered HALEU policy leaves no margin of safety. ■

REFERENCES AND NOTES

1. US AEC, "Research Reactors for Foreign Application: Report to the General Manager by the Director of Reactor Development" (1954); https://fissilematerials.org/library/haf54.pdf.
2. US NRC, "Rulemaking for Enhanced Security of Special Nuclear Material" (2015); https://www.nrc.gov/docs/ML1432/ML14321A007.pdf.
3. "Conversion of Research and Test Reactors to Low-Enriched Uranium (LEU) Fuel," Hearing before the Subcommittee on Energy Development and Applications and the Subcommittee on Energy Research and Production of the Committee on Science and Technology, US House of Representatives, 98th Congress (1984).
4. US AEC, Study of Strategic Importance of Nuclear Materials, (5 December 1966), as cited in "Report of the Advisory Panel on Safeguarding Special Nuclear Material" (1967); https://www.osti.gov/servlets/purl/4264753.
5. J. P. Lestone, M. D. Rosen, P. Adsley, *Nucl. Technol.* **207**, S352 (2021).
6. Web of Stories, "Meeting and working with Richard Feynman at Los Alamos," Interview with Hans Bethe (24 January 2008); https://www.webofstories.com/play/hans.bethe/92.
7. US DOE, "Additional Information Concerning Underground Nuclear Weapon Test of Reactor-Grade Plutonium"; https://www.osti.gov/opennet/forms.jsp?formurl=document/press/pc29.html.
8. US DOE, "Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives" (Office of Arms Control and Nonproliferation, DOE/NN-0007, 1997); https://www.osti.gov/scitech/servlets/purl/425259.
9. NASEM, *Merits and Viability of Different Nuclear Fuel Cycles and Technology Options and the Waste Aspects of Advanced Nuclear Reactors* (National Academy Press, 2023).
10. Nuclear Energy Institute to Secretary of Energy Rick Perry, "Need for High-Assay Low Enriched Uranium" (5 July 2018); https://www.nei.org/CorporateSite/media/filefolder/resources/letters-filings-comments/letter-perry-haleu-20180705.pdf.
11. US Congress, "Consolidated Appropriations Act, 2024," Public Law no. 118-42; https://www.congress.gov/bill/118th-congress/house-bill/4366/text.
12. UK Department for Energy Security and Net Zero, "UK invests in high-tech nuclear fuel to push Putin out of global energy market," (Press Release, 7 January 2024); https://www.gov.uk/government/news/uk-invests-in-high-tech-nuclear-fuel-to-push-putin-out-of-global-energy-market.
13. US NRC, "Fuel Cycle · Physical Security Requirements for Facilities With Category II Quantities of Special Nuclear Material Informational Sheet" (2023); https://www.nrc.gov/reactors/new-reactors/advanced/modernizing/rulemaking-and-guidance/fuel-cycle.html.
14. A. Finkbeiner, *Nature* **477**, 397 (2011).
15. A. W. Foss, C. Forsberg, "Markets and Economic Requirements for Fission Batteries and Other Nuclear Systems" (Idaho National Laboratory, Report CON-21-64808-Revision-0, 2021); https://inldigitallibrary.inl.gov/sites/sti/sti/Sort_54795.pdf.

ACKNOWLEDGMENTS

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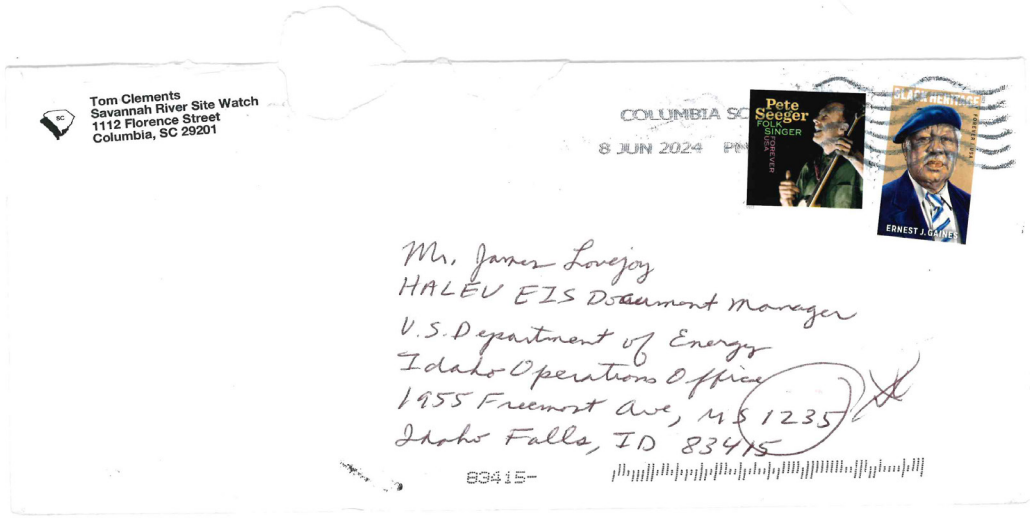

Commenter No. 223 (cont'd): Tom Clements, Savannah River Site Watch

SRS WATCH

June 7, 2024

Mr. James Lovejoy
HALEU EIS Document Manager
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Avenue, MS 1235
Idaho Falls, Idaho 83415

Comment for the record of the *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) (Draft HALEU EIS) (DOE/EIS–0559).*

Though this submission is late, given the importance of the proliferation issue at hand, I hereby request it be considered in preparation of the final EIS on HALEU production.

Attached you will find an article in Science magazine on June 6, 2024:

The weapons potential of high-assay low-enriched uranium

Recent promotion of new reactor technologies appears to disregard decades-old concerns about nuclear proliferation

I request that this article be considered in preparation of the EIS. The article concludes:

Given the stakes, we recommend that
the US Congress direct the DOE's National
Nuclear Security Administration to commission
a fresh review of HALEU proliferation
and security risks by US weapons
laboratory experts. This study should take
into consideration advancements in modeling

Savannah River Site Watch | 1112 Florence Street, Columbia, South Carolina 29201 | 1-804-834-3084 | www.srswatch.org |

223-1

223-1 DOE acknowledges that the widescale deployment of HALEU fuels, which could be facilitated by the Proposed Action, presents different proliferation challenges than the use of low enriched uranium. DOE assesses that adequate structures are in place to manage the evolving proliferation challenges to acceptable levels and that the benefits of use of HALEU in advanced reactors outweighs the potential proliferation risks. DOE will continue to conduct assessments of proliferation and security risks related to the potential expanded global commercial use of HALEU, and its use in A/SMRs, and will work with civil nuclear stakeholders to address any new risks that are identified. DOE has established and is continually improving outreach mechanisms and programs to assist domestic industry partners in approaches to assess the risks posed by their concepts, integrate recommended design changes, and demonstrate the safety, security, and safeguards of their designs. Please see Section 3.9, "Nonproliferation and Terrorism Concerns," of Volume 1 of the EIS for more information on these concerns. Also, please refer to Section 2.3, "Nonproliferation and Terrorism," of this CRD for a discussion of this topic and DOE's response.

Commenter No. 223 (cont'd): Tom Clements, Savannah River Site Watch

simulation, and nuclear-explosive engineering that have emerged since the AEC's 1966 study. A 2023 study by the US National Academies of Science, Engineering, and Medicine (NASEM) on the merits of different reactor and fuel cycle concepts made a similar recommendation regarding the utilization of HALEU. Given the large number of private corporations now counting on HALEU and the enormous sums flowing through the DOE to support a HALEU ecosystem, the DOE is not free of conflicts of interest. We therefore further recommend that the proposed study be peer reviewed by an independent body with the necessary technical expertise and security clearances. The NASEM or the JASON group of technical consultants, having a history of credible work regarding weapons and proliferation, could conduct such a review and provide an unclassified summary for policymakers. The matter is urgent because industry needs to know sooner rather than later the true security risks to avoid designing reactors that could be sources of nuclear weapons material.

A key outcome of this study should be to set a new, technically justified, and lower enrichment limit for weapons-usable uranium. According to the information available now, a reasonable balance of the risks and benefits would be struck if enrichments for power reactor fuels were restricted to <10 to 12% 235U. If higher enrichments continue to be used, security relevant quantities should be subject to appropriate physical protection. At present, the highest security classification of HALEU under both US and international standards is Category II, which has as a protection objective the early detection of theft. Security-relevant quantities of HALEU should be recategorized as Category I material, which requires the prevention of theft and is the standard

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Commenter No. 223 (cont'd): Tom Clements, Savannah River Site Watch

used for analogous quantities of weapons-usable HEU and plutonium. A 10 to 12% threshold for Category I protection would allow many reactor designs to move forward with only modest economic consequences

The decision on how to handle HALEU domestically has crucial downstream consequences for global security. Were HALEU to become a standard reactor fuel without appropriate restrictions determined by an interagency security review, other countries would be able to obtain, produce, and process weapons-usable HALEU with impunity, eliminating the sharp distinction between peaceful and nonpeaceful nuclear programs. Such countries would be only days away from a bomb, giving the international community no warning of forthcoming nuclear proliferation and virtually no opportunity to prevent it. An unfettered HALEU policy leaves no margin of safety.

Thank you for reviewing the article and responding in the EIS to points raised in it, especially concerning a peer-reviewed study on the proliferation impacts associated with HALEU production and utilization.

I request this comment and the attached article be made part of the EIS record.

I have also emailed this comment.

Additionally, apart from the preparation of the EIS, the article should be circulated to those working on the HALEU project.

Tom Clements
SRS Watch
Columbia, SC

223-1 (cont'd)

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POLICY FORUM

NUCLEAR SECURITY

The weapons potential of high-assay low-enriched uranium

Recent promotion of new reactor technologies appears to disregard decades-old concerns about nuclear proliferation

By R. Scott Kemp[1], Edwin S. Lyman[2], Mark R. Deinert[3], Richard L. Garwin[4], Frank N. von Hippel[5]

Preventing the proliferation of nuclear weapons has been a major thrust of international policymaking for more than 70 years. Now, an explosion of interest in a nuclear reactor fuel called high-assay low-enriched uranium (HALEU), spurred by billions of dollars in US government funding, threatens to undermine that system of control. HALEU contains between 10 and 20% of the isotope uranium-235. At 20% ^{235}U and above, the isotopic mixture is called highly enriched uranium (HEU) and is internationally recognized as being directly usable in nuclear weapons. However, the practical limit for weapons lies below the 20% HALEU-HEU threshold. Governments and others promoting the use of HALEU have not carefully considered the potential proliferation and terrorism risks that the wide adoption of this fuel creates.

> "...computational tools that facilitate weapons design have spread around the world, placing greater importance on controlling nuclear materials..."

Commercial reactor fuels typically have low enrichments, in the range of 3 to 5% ^{235}U. At these enrichments, the fuel cannot sustain an explosive chain reaction. This has prevented nations or terrorists from simply repurposing commercial reactor fuel for weapons. Above around 6% ^{235}U, the fuel can sustain a fast chain reaction at normal density, but the mass needed for a weapon would be prohibitively large. Producing fuel with higher ^{235}U concentrations reduces the mass needed for a weapon to practical levels, but doing so requires enrichment capabilities that are controlled by only a small handful of countries. This arrangement effectively blocks most nations from modifying fresh nuclear reactor fuel to make weapons.

For technical reasons, the traditional 3 to 5% fuel will not suffice for many of the power reactor designs that nuclear engineers want to build today. For example, proposed microsized reactors are so inefficient with their neutrons that they need HALEU simply to turn on. Most designers favor 19.75% ^{235}U HALEU—on the cusp of HEU—because more ^{235}U almost always eases constraints, but use of HEU is discouraged because of its clear weapons potential. In many designs, the amount of HALEU needed is hundreds to thousands of kilograms, which may mean that a single reactor contains enough HALEU to make a nuclear weapon. If this is the case, commercializing HALEU fuels without ensuring that the material is appropriately protected against diversion by national governments or theft by terrorists would pose a serious threat to security.

In 1954, the US government's weapons laboratory at Los Alamos performed studies to assess the weapons utility of uranium of various enrichments (*1*). The issue at the time was the proliferation potential of proposed exports of research reactors to foreign nations under the Atoms for Peace program. Using the information from Los Alamos, the US Atomic Energy Commission (AEC) concluded that fuels enriched to <10% ^{235}U were not weapons usable, regardless of the quantity. However, between 10 and 20% ^{235}U, the materials were of "weapon significance" and could be used in a nuclear weapon if available in sufficient quantity. On the basis of this assessment, the AEC allowed uranium exports of up to 20% ^{235}U—in part because it was concerned about the higher cost of reactors using fuel with lower enrichments—provided that the quantities were below the threshold of weapon significance.

In the mid-1960s, the AEC organized a new study to establish a technical basis for domestic nuclear material accountancy and security requirements (*2*). This ultimately led the agency to develop security rules for domestic users that contained an exemption for any quantity of uranium enriched below 20% ^{235}U. In 1979, a 20% lower limit on the enrichment of uranium considered to be weapons usable was adopted by the US Nuclear Regulatory Commission (NRC) in its rule on physical protection.

Why the AEC, and later the NRC, issued regulations that appear to disregard the findings related to HALEU from the original Los Alamos weapons laboratory study is unclear because the details remain classified. However, in 1984, J. Carson Mark, head of the Los Alamos Theoretical Division responsible for designing nuclear weapons from 1943 until 1973, confirmed in congressional testimony that HALEU was weapons usable down to 10% ^{235}U (*3*).

Several factors appear relevant to the creation of the loophole for HALEU. Historically, HALEU was only rarely used and limited mainly to research reactors. It would not have been practical to make a weapon from the small quantities used in a single research reactor, and regulators held that it was implausible that simultaneous thefts from multiple research reactors would occur. It was also the case that the AEC's perspective on safeguards was established by a panel of industry representatives who believed that the future would be powered by nuclear reactors fueled with plutonium (*4*). In such a world, the additional risk from HALEU might have seemed insignificant because plutonium is a much more attractive bomb material. However, that world never emerged. The geological abundance of uranium turned out to be more than originally predicted, and uranium's considerably more-favorable economics won the day.

Over the past few decades, the situation has evolved. Information and computational tools that facilitate weapons design have spread around the world, placing

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Commenter No. 223 (cont'd): Tom Clements, Savannah River Site Watch

INSIGHTS | POLICY FORUM

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greater importance on controlling nuclear materials that were previously viewed as being of marginal utility. This, combined with recent proposals for increasing the use of HALEU in quantities that far exceed those required in the past, means that the time has come to review policies governing the use of this material.

The weapons potential of HALEU can be examined using the Serber-Bethe-Feynman formula (*5*). It relates the potential explosive yield to the spherical radius of an initial supercritical mass, the radius at which the mass becomes subcritical during explosive expansion, the rate of growth of the neutron chain reaction, and scaling constants with exact values that are determined from classified nuclear weapons tests but can be roughly approximated from the properties of unclassified systems. Although simple, the formula is famously reliable (*6*). Estimates of the inputs to the formula using a variety of open sources (including published critical mass and kinetics parameter data for different enrichments and core-reflector combinations) indicate that HALEU above about 12% ^{235}U could be used to make a practical weapon. These assessments indicate that quantities ranging from several hundred kilograms to about 1000 kg of 19.75% HALEU could produce explosive yields similar to or greater than that of the 15 kilotons of TNT equivalent bomb that the United States dropped on Hiroshima, Japan, at the end of World War II.

Designing such a weapon would not be without its challenges, but there do not appear to be any convincing reasons why it could not be done. The amount of nuclear material would be large compared with traditional weapons but not prohibitively so. Our extreme example of 1000 kg constitutes a metal ball with a diameter of 46 cm (18 inches). The neutron reflector and assembly mechanism would be added to this, but even so, the final size and weight might be acceptable if the weapon were delivered using an airplane, a delivery van, or a boat sailed into a city harbor.

A second challenge relates to a phenomenon called preinitiation, which could cause a substantial reduction in explosive yield. This occurs when neutrons emitted spontaneously by uranium-238, the dominant isotope in HALEU, initiate a nuclear chain reaction in the bomb core before the moment of maximum reactivity. This problem is much worse for reactor-grade plutonium, which has a spontaneous neutron emission rate about 300 times as high as that of 15% HALEU when scaled to the bare critical masses for the two materials. Even so, reactor-grade plutonium has been used successfully to make bombs (*7*), and the US Department of Energy (DOE) has said that: "At the lowest level of sophistication, a potential proliferating state or subnational group using designs and technologies no more sophisticated than those used in first-generation nuclear weapons could build a nuclear weapon from reactor-grade plutonium that would have an assured, reliable yield of one or a few kilotons (and a probable yield significantly higher than that)" [(*8*), p. 38]. This indicates that the preinitiation problems of HALEU can be overcome. Although preinitiation may have a bigger impact on some designs than others, even those that are sensitive to it could still produce devastating explosive power.

"Such countries would be only days away from a bomb, giving the international community no warning of forthcoming nuclear proliferation..."

If the weapons usability of HALEU is borne out, then even a single reactor would pose serious security concerns. Yet, the DOE and US Department of Defense are providing funds for more than 10 reactor concepts with cores containing from several hundreds to many thousands of kilograms of HALEU, including the Natrium reactor being developed by TerraPower, a company founded by Bill Gates (*9*).

The 20% statutory division between HALEU and HEU has been interpreted as the technical threshold between weapons-usable and -nonusable uranium by generations of nuclear professionals. There was therefore little concern when, in 2018, the US nuclear power industry's lobbying organization, the Nuclear Energy Institute (NEI), pushed the US government to make more than a hundred tons of HALEU available annually by late this decade (*10*). Congress responded in the 2020 Energy Act, directing the DOE to share HALEU with private companies. In October 2020, the DOE announced a 50% cost-sharing program, providing up to $4 billion in federal funds to two demonstration reactors that plan to use multiton quantities of HALEU

PHOTO: POPPERFOTO/GETTY IMAGES

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REFERENCES AND NOTES

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2. US NRC, "Rulemaking for Enhanced Security of Special Nuclear Material" (2015); https://www.nrc.gov/docs/ML1432/ML14321A007.pdf.
3. "Conversion of Research and Test Reactors to Low-Enriched Uranium (LEU) Fuel," Hearing before the Subcommittee on Energy Development and Applications and the Subcommittee on Energy Research and Production of the Committee on Science and Technology, US House of Representatives, 98th Congress (1984).
4. US AEC, Study of Strategic Importance of Nuclear Materials, (5 December 1966), as cited in "Report of the Advisory Panel on Safeguarding Special Nuclear Material" (1967); https://www.osti.gov/servlets/purl/4264753.
5. J. P. Lestone, M. D. Rosen, P. Adsley, *Nucl. Technol.* **207**, S352 (2021).
6. Web of Stories, "Meeting and working with Richard Feynman at Los Alamos," Interview with Hans Bethe (24 January 2008); https://www.webofstories.com/play/hans.bethe/92.
7. US DOE, "Additional Information Concerning Underground Nuclear Weapon Test of Reactor-Grade Plutonium"; https://www.osti.gov/opennet/forms.jsp?formurl=document/press/pc29.html.
8. US DOE, "Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives" (Office of Arms Control and Nonproliferation, DOE/NN-0007, 1997); https://www.osti.gov/scitech/servlets/purl/425259.
9. NASEM, *Merits and Viability of Different Nuclear Fuel Cycles and Technology Options and the Waste Aspects of Advanced Nuclear Reactors* (National Academy Press, 2023).
10. Nuclear Energy Institute to Secretary of Energy Rick Perry, "Need for High-Assay Low Enriched Uranium" (5 July 2018); https://www.nei.org/CorporateSite/media/filefolder/resources/letters-filings-comments/letter-perry-haleu-20180705.pdf.
11. US Congress, "Consolidated Appropriations Act, 2024," Public Law no. 118-42; https://www.congress.gov/bill/118th-congress/house-bill/4366/text.
12. UK Department for Energy Security and Net Zero, "UK invests in high-tech nuclear fuel to push Putin out of global energy market," (Press Release, 7 January 2024); https://www.gov.uk/government/news/uk-invests-in-high-tech-nuclear-fuel-to-push-putin-out-of-global-energy-market.
13. US NRC, "Fuel Cycle - Physical Security Requirements for Facilities With Category II Quantities of Special Nuclear Material Informational Sheet" (2023); https://www.nrc.gov/reactors/new-reactors/advanced/modernizing/rulemaking-and-guidance/fuel-cycle.html.
14. A. Finkbeiner, *Nature* **477**, 397 (2011).
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SECTION 4
SCOPING COMMENT SUMMARY

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4.0 Scoping Comments Summary

On June 5, 2023, DOE-NE published a Notice of Intent (NOI) in the *Federal Register*, 88 Fed. Reg. 36573 (June 5, 2023), to prepare an EIS for *DOE Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU) Fuel* (hereafter referred to as the HALEU EIS). Publication of the NOI initiated a 45-day scoping period.

Notices of the scoping period, and the three virtual scoping meetings, were published as press releases, email notifications, DOE-NE social media posts, and in the following newspaper outlets:

Metropolis Planet	Metropolis, Illinois
Portsmouth Daily Times	Portsmouth, Ohio
Wilmington Star-News	Wilmington, North Carolina
Post Register	Idaho Falls, Idaho
Oak Ridger	Oak Ridge, Tennessee
Erwin Record	Erwin, Tennessee
Lynchburg News and Advance	Lynchburg, Virginia
Chadron Record	Chadron, Nebraska
Custer County Chronicle	Custer, South Dakota
Fall River County Herald Star	Hot Springs, South Dakota
Rapid City Journal	Rapid City, South Dakota
Hobbs	Hobbs and Carlsbad, New Mexico
Gallup Independent	Church Rock and Crownpoint, New Mexico
Navajo Times	Church Rock and Crownpoint, Arizona
Andrews Country News	Andrews, Texas
Falfurrias Facts	Brooks, Texas
Beeville Bee-Picayune	Bee County, Texas
Goliad Advance Guard	Goliad, Texas
Karnes Countywide	Karnes, Texas
Kingsville Record	Kleberg, Texas
Corpus Christi Caller-Times	Duval, Texas
Port Aransas South Jetty	Duval, Texas
The Insider	Escalante, Utah
San Juan Record	Monticello, Utah
Casper Star-Tribune	Casper, Wyoming
Rock Springs Rocket-Miner	Rock Springs, Sweetwater, Jack, and Antelope, Wyoming
Green River Star	Sweetwater, Wyoming
Gillette News Record	Campbell and Johnson, Wyoming
Buffalo Bulletin	Campbell and Johnson, Wyoming
Rawlins Times and Saratoga Sun	Carbon County, Wyoming

Wyoming Pioneer	Sundance and Crook, Wyoming
Douglas Budget	Converse, Wyoming
Riverton Ranger	Fremont, Wyoming
Kingman Daily Miner	Mohave, Arizona
Montrose Daily Press	Montrose County, Colorado
Telluride Daily Planet	San Miguel County, Colorado
USA Today	National

Without knowing the locations for future HALEU facilities or activities, DOE believed the selected newspaper outlets, in combination with other digital notifications, would effectively communicate the availability of the NOI to the public. This list of distributers was designed to include locations with existing uranium fuel cycle facilities and their local communities (including environmental justice communities), as identified in existing NEPA documentation.

DOE-NE hosted three virtual scoping meetings at 6 p.m. Eastern Time ET, 8 p.m. ET, and 10 p.m. ET on June 21, 2023. The purpose of these meetings was both to allow the public to familiarize themselves with the Proposed Action, the EIS, and the NEPA process, as well as provide opportunities to submit formal comments on the scope of the EIS. These meetings were an important component of DOE's continued efforts to provide stakeholders and the public with opportunities to participate in the NEPA process. In addition to providing oral comments at the scoping meetings, interested parties were instructed they could provide written comments by email or by U.S. mail.

During the scoping period, DOE received 11 oral comments (transcribed into written comments) and 37 written comment documents from the previously listed submission methods (i.e., either through email or U.S. mail). From these 48 comment documents, 282 comments were identified. DOE also received 1,675 comment documents submitted through www.regulations.gov. From those 1,675 comment documents, 127 comments were identified. Fewer individual comments than comment documents were identified from the www.regulations.gov submissions because most of the comment documents included identical wording. DOE reviewed the individual comments; those providing similar input were grouped together and treated as a single comment, concern, or issue. A summary of comments received are as follows.

4.1 Proposed Action and Related Activities

4.1.1 Mining and Milling

Comment Summary: Several commenters were concerned about where uranium was being sourced, whether domestic or internationally. If in the United States, a commenter requested to know where. Other commenters also wanted to be informed as to what technologies would be used to obtain the uranium ore (i.e., surface mining/strip mining, in-situ leaching/recovery, etc.).

Comment summary: Some commenters requested uranium mining take place domestically to ensure Federal environmental quality standards were met. Another commenter cited conclusions from the Texas Commission on Environmental Quality that in-situ recovery (ISR) mining has not shown any instance of causing offsite pollution, as evidence of safe domestic mining practices.

Comment Summary: Another commenter requested that DOE urge EPA to increase environmental quality standards related to mining practices. This commenter, and other commenters referenced the need to protect aquifers which risk depletion in ISR mining scenarios and health of wildlife populations within regions of the United States with uranium mining.

Comment Summary: Commenters had questions regarding the sourcing of the uranium. Specifically, whether the uranium would come from domestic or international sources, and where natural uranium was found.

Comment Summary: Commenters also asked what mining technologies and milling technologies would be used and the amount of research that has been done on the viability of these technologies. Types of suggested recovery methods include the use of surface or strip mines, underground mines, in-situ leaching/recovery, recovery from other mineral extraction (e.g., by-product of phosphate fertilizer production), and extraction from seawater.

Comment Summary: Commenters expressed that the best way to ensure the extraction and recovery of uranium from uranium ore deposits are performed in an environmentally responsible manner is to require that uranium is sourced within the United States. Commenters stated that foreign mines can often produce uranium at a lower cost than domestic mines due to less stringent environmental regulations or protections. The EIS should consider the "costs" associated with foreign and domestic uranium sourcing including environmental factors.

Comment Summary: Commenters stated the EIS should clearly document the range of potential environmental impacts caused by uranium recovery operations in the United States. This should include the precise amounts, types, and potential impacts of uranium recovery as well as cumulative and synergistic impacts.

4.1.2 Conversion

Comment Summary: One commenter asked where the uranium hexafluoride (UF_6) will be converted into forms suitable for fuel fabrication and what safety and security precautions will be taken.

Comment Summary: One commenter wondered why the HALEU EIS will evaluate existing capabilities, such as uranium ore production and conversion, when DOE instead should focus on capabilities that need to be developed to enable HALEU fuel fabrication, such as enrichment, de-conversion, transportation, and fuel fabrication.

Comment Summary: One commenter asked whether any irradiated uranium would be used in the HALEU production process.

4.1.3 Enrichment

Comment Summary: Comments were received related to the potential locations of enrichment facilities, measures and plans that would make enrichment safe, the characteristics and volumes of DU. Additional comments by EPA were received regarding how uranium enrichment and other related activities may be affected by seismicity in tectonically active zones, and additional factors related to this concern and that these should be addressed in the EIS.

Comment Summary: One commenter had questions related to ongoing activities at American Centrifuge Operating, LLC (ACO), specifically regarding ACO's license to enrich uranium up to 25%, how this relates to the NRC special nuclear material categories, and why an initial public/private partnership is needed given ongoing and planned HALEU activities at ACO. In addition, the commenter inquired why it is necessary for a commercial entity to enrich uranium to support the program, and whether this is what Centrus plans to do. Another commenter stated that the EIS should address whether the EIS applies to not only proposed HALEU actions, but also to actions already taken by DOE for HALEU production, such as DOE contracted operation with ACO to produce HALEU. The commenter also stated that the EIS should address whether any anticipated uranium enrichment at Portsmouth, Ohio, would disrupt planned cleanup efforts of legacy contamination.

Comment Summary: The EPA noted that the NOI places LEU fuel in three categories (less than 5% U-235, 5% to 10% U-235, and 10% to less than 20% U-235), and requested details regarding anticipated amounts for each category as well as to define those advanced reactor designs requiring each category of uranium enrichment.

Comment Summary: Comments were received related to the amount of DU generated per MT of HALEU being greater than quantities generated during production of LEU, and whether the properties of the DU would be different than LEU-generated DU. The commenter also inquired about the volumes of DU that would be produced and whether deconversion would be performed at that enrichment plant.

4.1.4 Deconversion

Comment Summary: One commenter asked where deconversion would be performed or if it would be performed only at enrichment facilities. Another commenter said that the EIS should address the potential environmental and related impacts of disposition path for hydrogen fluoride or other fluoride forms resulting from the uranium deconversion process.

4.1.5 Storage

Comment Summary: One commenter asked how HALEU will be stored and what safety and security steps will be taken to protect the public.

Comment Summary: Commenters mentioned that the EIS should address the planned types of containers that would be used for storage/transportation of UF_6 and other uranium forms in the overall HALEU production process and whether they will meet current approved design/test criteria.

4.1.6 Transportation

Comment Summary: Several commenters expressed concerns about the type of containers that would be used to transport HALEU to fuel fabrication facilities and the status of the container certifications meeting the current approved design and the NRC requirements, modes of transportations, details on the transportation risk assessments, especially the radiological impacts, Tribal concerns regarding transportation between HALEU facilities and activity sites and transportation planning and emergency management.

4.1.7 Post-Proposed Action Activities

4.1.7.1 Fuel Fabrication

Comment Summary: Several commenters mentioned the array of reactor designs and the wide range of fuel types, and questioned where and how the fuel fabrication would take place. Other comments expressed concern for fabrication of fuel enriched to greater than 20% U-235, economic feasibility, and the necessity for DOE to request additional funding from Congress.

4.1.7.2 Reactor Technologies

Comment Summary: One commenter stated that advanced nuclear reactors are not needed nor are they wanted in Texas. Several commenters mentioned that reactors that use HALEU fuel do not currently exist, have not been designed or have designs that are still evolving, and are not licensed. Another commenter cited a study related to waste generated by small modular reactors and stated that DOE should stop the industry from making unsubstantiated claims about the lessening of nuclear waste production by its new generation of reactors.

Comment Summary: Commenters asked which reactors would use HALEU and expressed concerns about the safety of new reactor designs and parameters, such as quantity of HALEU fuel required, needed

enrichment levels of the fuel, waste forms, burnup rates, decay heat, source terms, and transport of the spent fuel. In relation to the reactor designs, another commenter asked for specifics of how HALEU allows developers to optimize their systems for longer life cores, increased safety margins, and other increased efficiencies. Related to energy efficiency, a commenter referred to statements by DOE that the use of HALEU results in more efficient production of energy (versus LEU) and thus reduces the quantity of U-235 that is needed to produce the same amount of energy.

Comment Summary: The commenter requested quantification of the additional energy produced per MT of U-235 when using HALEU fuel. A comment also mentioned enrichment categories of less than 5%, 5% to 10%, and 10% to less than 20%, and requested that amounts be specified for each category. The topic of cost and timeframe for reactor construction was also mentioned. A commenter stated that it is highly doubtful this effort to commercialize can meet the schedules and milestones necessary to support U.S. demonstration reactor projects, and questioned how the Record of Decision could have merit. One commenter requested that the EIS provide a discussion of the benefits of advanced power reactors in relation to wind or solar power generation.

Comment Summary: Several commenters mentioned that the proposed new reactors have not been licensed or built while another commenter added that a comprehensive analysis detailing the entirety of the new nuclear fuel chain from mining the ore to disposing the "hot" waste is needed.

4.1.7.3 Spent Fuel Management and Disposition

Comment Summary: Commenters were concerned we would be creating SNF that might be even more difficult to manage and isolate/dispose. Additionally, that the EIS should describe the forms and thermal profiles of spent fuel generated by each advanced reactor technology, as well as limitations encountered in providing sufficient information needed to enter a standard contract with DOE to take possession of the fuel.

Comment Summary: Commenters were concerned that we do not have a disposal path forward for SNF and DOE should not take action until the SNF problem is addressed.

Comment Summary: Commenters stated that the cleanup of all nuclear waste should be included in the scope of the EIS. Additionally, they indicated that the waste generated as a result of producing and using HALEU would be much hotter and more radioactive than the LEU fuel cycle. Finally, there was a request to evaluate environmental impacts that are associated with U-235's long decay process.

4.2 Other Project Concerns Identified During Scoping

4.2.1 Accidents & Human Health

Comment Summary: Several commenters mentioned previous reactor accidents, criticality accidents, effects of accidental uranium (including DU) releases, and effects from the releases on food and the environment. A request included looking at the effects of extreme events on the nuclear fuel cycle facilities. Comments requested that effects from facilities at Portsmouth, Ohio, and Erwin, Tennessee, be addressed. A comment suggested that there are increased risks associated with enriching uranium to levels above LEU. Commenters requested that the toxicological profile for uranium and other health effects related references be cited in the EIS while others mentioned radiological effects on communities and the safeguards to prevent injury to the public

Comment Summary: Commenters expressed concerns about the existing radiological environments at sites that could be used for HALEU fuel cycle facilities (particularly mine locations, the Nuclear Fuel Service, Inc. facility in Erwin, Tennessee, and the American Centrifuge Plant in Piketon, Ohio). All three sites have a history of use in the uranium fuel cycle industry. Commenters cite a history of contamination and studies

addressing the radiological impacts from past activities. The commenters stated that the HALEU EIS should include a detailed discussion of the past/existing radiological environment.

Comment Summary: One commenter noted that the impacts of radiological exposure differ between men, women, and children, and requested that in addition to the impacts to "male" gender and radiation issues, these issues be addressed in the EIS.

Comment Summary: One commenter mentioned that the health and safety for all people and of the entire planet needs to be considered as top priorities and not just money-making for the fuel companies. Additional comments indicated that health impacts are multiple, additive, cumulative, and synergistic, and that monitoring, historical research, and epidemiological analysis are required.

4.2.2 Alternatives

Comment Summary: One commenter requested information on existing DOE stockpiles of HEU that could be potential sources for the HALEU Availability Program, including stockpile locations, quantities, and how processing of that material would be performed.

Comment Summary: Commenters stated a preference for safe and renewable energy technologies like Leadership in Energy and Environmental Design buildings, wind, solar, hydro-power, geothermal, and battery storage, and asked that diversion of resources from proven effective climate friendly technologies to unproven technologies like advanced reactors (including breeder reactors) using HALEU must be considered as part of the EIS including its impact on global warming.

Comment Summary: A commenter suggested that it would be more efficient for HALEU to be supplied directly from the producer to the user.

Comment Summary: A commenter suggested that any facility using HALEU (e.g., small modular reactors, fuel fabricators, metals fabricators, etc.) should be a Category I facility.

Comment Summary: Commenters suggested that the costs and risks to the nation, and to the world, of the HALEU Availability Program favor the No Action Alternative.

Comment Summary: A commenter suggested that DOE provide off ramps and mitigation strategies that lessen the potential environmental impacts of construction of an entirely new front end of the nuclear fuel cycle.

Comment Summary: A commenter requested that DOE evaluate all reasonable alternatives that fulfill the Purpose and Need, including alternatives outside DOE's legal jurisdiction and include options for avoiding significant environmental impacts.

Comment Summary: EPA recommended the Draft HALEU EIS clarify all alternative sources or stockpiles of HEU that may be under consideration by DOE for purposes of the HALEU Availability Program and that the environmental analyses include those sources and their present and/or reasonably foreseeable processing and storage location(s) within the scope of the environmental review. EPA believes this would allow DOE to meet NEPA requirements to analyze a full range of reasonable action alternatives in the Draft HALEU EIS.

Comment Summary: EPA recommended the DOE program be designed to include a monitoring program to assess both impacts from the program and activities, and effectiveness of mitigation measures. The HALEU EIS should do the following:

- Describe such monitoring program and how it will be used as an effective feedback mechanism for the program.

- Provide assurances that the program's environmental measures will be adjusted to meet Federal, state, local laws, regulations, and policy objectives during the life of the program.
- Include commitments to using the best available techniques for monitoring, evaluating, and mitigating the program impacts.

Comment Summary: A commenter suggested that DOE's description of HALEU activities should be revised to include the production of UF_6 through enrichment of DOE's DU tails. Global Laser Enrichment won a competitive contract in 2016 to enrich DOE's tails remaining from legacy gaseous diffusion enrichment at Paducah, Kentucky. The enrichment of tails and potential use in the production of HALEU will eliminate a DOE liability and transform it into fuel for reactors. DOE's list of HALEU Availability Program activities subject to NEPA review should include this method of producing natural UF_6 for completeness.

Comment Summary: A commenter requested the Draft HALEU EIS address the option of production of HALEU at the Savannah River Site (SRS). DOE-NE, in the Draft HALEU EIS, should examine the decision by DOE's Office of Environmental Management to send HEU from processed SNF to be discarded in high-level waste glass, and determine if it should be reversed or concurred with. If the decision is not reversed, a large amount of HEU will be discarded into the SRS high-level waste tanks. Does DOE-NE agree that this HEU should be discarded and not downblended to HALEU? Please evaluate assuming costs of HALEU production at H-Canyon.

As foreign and domestic research reactor spent fuel will still have to be managed after 2037, at which time the SRS high-level waste tanks are set to be emptied and closed, the Draft HALEU EIS should evaluate options to place a new separation technology in H-Canyon after the current technology halts operation.

Likewise, the Draft HALEU EIS should discuss construction of a new DOE reprocessing plant that could be used to reprocess DOE SNF and downblend the separated HEU to HALEU. The Draft HALEU EIS should examine if any new reprocessing plant or continued HEU separation at the aging H-Canyon could be integrated into plans to produce HALEU at an enrichment facility.

Comment Summary: A commenter stated that there is no mention in the EIS scope of alternative nuclear fuels such as thorium-based fuels, or recycling of spent nuclear fuel. The commenter believed this is needed to ensure that the EIS will not be used inappropriately to encompass these other systems.

Comment Summary: Commenter recommended that we not permit commercial production of HALEU of nuclear fuels until we safely transition to nuclear fusion.

4.2.3 Cost

Comment Summary: Commenters questioned the high cost of cleanup and long-term management at contaminated DOE sites, the lack of funding to complete cleanups, and where the money for future cleanups would come from. Another commenter suggest that DOE spend this money fixing the pollution at Hanford, Santa Susana, Oak Ridge, Los Alamos, and mining wastes across the United States.

Comment Summary: Commenters stated that nuclear power is the most expensive source of power, and its cost is rising while the cost of a clean renewable energy system including wind, solar, and storage is dropping. Commenters asked that the costs of nuclear power be fully disclosed including full fuel cycle costs, costs of GHG and toxic emissions, costs of waste management and security in perpetuity, and costs of the Price Anderson Act.

Comment Summary: Commenters requested that DOE fully disclose all costs. They requested an accounting and disclosure of the money, the subsidies, that have been spent on the nuclear enterprise to date, including with respect to the subsidizing of reactor fuel development.

4.2.4 Environmental Impacts

Comment Summary: A commenter stated that the intended EIS scope does not mention that full life cycle analysis or holistic analysis methodologies will be employed in the environmental, economic, and socioeconomic alternative analyses required under NEPA. The commenter further stated, given the long radioactive lifetimes of uranium and other nuclear fuels with time scales in excess of 100s of thousands of years, this form of assessment is absolutely mandatory.

Comment Summary: A commenter asked that the HALEU EIS provide all necessary studies and research that support the quantities and composition of air emissions, surface and groundwater discharges, and solid and hazardous waste levels generated by the HALEU Availability Program.

Comment Summary: Commenters expressed the EIS should consider multiple, additive, cumulative and synergistic impacts related to the HALEU Availability Program. Similarly, that impacts on water, air, plants and animals, socioeconomics and environmental justice are considered.

4.2.5 Air Quality

Comment Summary: The EPA recommended that the HALEU EIS provide information on (1) several topics related to impacts from nonradiological and radiological air emissions, and (2) measures to mitigate project air quality impacts.

Comment Summary: A commenter recommends that the HALEU EIS include an assessment of how radiation emitted from the processes that produce HALEU be added to the conventional criteria for air quality.

4.2.6 Climate Change & Greenhouse Gases (GHGs)

Comment Summary: The EPA recommended that the HALEU EIS do the following when evaluating impacts on climate change:

- Consider approaches outlined in the CEQ's "Final Guidance for Greenhouse Gas Emissions and Climate Change Impacts" and include relevant information in the EIS.
- Implement practicable mitigation practices for reducing GHGs from the HALEU Availability Program.

Comment Summary: A commenter asked if the HALEU EIS will include a carbon footprint analysis of the entire HALEU fuel chain from mining to postburn.

Comment Summary: A commenter requested that the HALEU EIS address climate impacts from uranium production, enrichment, and deconversion compared to the use of clean energy sources or power sources that would contribute to atmospheric carbon.

Comment Summary: A commenter requested that the HALEU EIS must consider the additional impacts associated with the greater natural uranium requirements per gigawatt electrical-year for advanced reactors that would use HALEU fuel. These include not only the detrimental health and environmental impacts of uranium mining and milling, both on workers and affected communities, but also their additional carbon emissions.

4.2.7 Environmental Justice

Comment Summary: Several commenters mentioned Indigenous Peoples, Tribes, or other environmental justice communities, and either requested more information on the process involved in coordinating with these groups or requested compliance with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*. Comments were also made requesting the EIS examine the impacts of the

Proposed Action on these groups, including legacy impacts. One commentator noted that positive impacts in the forms of jobs could result as nuclear plants replace coal powered plants that would otherwise be shut down. The EPA recommended Environmental Justice (EJ) Screen for use in conducting environmental justice analysis in the EIS.

4.2.8 National Environmental Policy Act (NEPA)

Comment Summary: Many commenters requested DOE strictly adhere to or speed up the project timeline. Of these commenters, some suggested removing duplicative reviews and others suggested preparing an Environmental Assessment instead of an EIS, with one commenter requesting the preparation of a Programmatic EIS.

Comment Summary: Several commenters stressed the importance of meaningful public engagement. Their concerns included valuing the comments of individuals and community members in the same regard as industries and agencies, recognizing the value of community knowledge, and adhering to Executive Order 14096*, Revitalizing Our Nation's Commitment to Environmental Justice for All.* Additionally, there was one request to involve independent subject matter experts to prepare a fully comprehensive EIS.

Comment Summary: One commenter stated DOE's list of covered NEPA topics is insufficient. This commenter stated there needs to be much more specificity about specific technologies, facilities, and locations that DOE anticipates covering under this NEPA process. Additionally, the commenter suggested that if there are uncertainties or complex considerations, for DOE to be explicit about those uncertainties and considerations.

Comment Summary: DOE received several comments requesting to be added to the notification list, one comment requesting acknowledgement, and one comment requesting a hard copy of the Draft HALEU EIS, when available. Additionally, DOE received several comments asking for clarification on when and where the public meeting recordings would be posted.

Comment Summary: A commenter stated that they understand that EISs are required under the NEPA to objectively evaluate major federal agency actions that could significantly affect the environment, but they could not understand why HALEU activities have been started before an EIS has been completed.

Comment Summary: One commenter expressed that NEPA documents are required to show a comparative analysis of alternatives to the proposed action. Several commenters also expressed the need for comparison to other clean energy technologies.

Comment Summary: One commenter recommended the EIS consider the following topics:

- Demonstrated Purpose and Need
- Alternatives to the Proposed Action
- Environmental impacts (natural, cultural and human)
- Nuclear waste management including storage and spent fuel
- Various reactor technologies
- Transportation of radioactive materials
- Accidents & human health
- Environmental Justice & Justice40
- Nonproliferation
- Support or opposition to the program
- Regulatory concerns

Comment Summary: Another comment recommended leveraging insights from existing EIS documents prepared for relevant facilities as a guide when preparing the EIS for HALEU program activities, and cited as examples previous environmental reviews performed for enrichment at Centrus and Urenco (currently Urenco USA, or UUSA), deconversion of UF_6 to uranium oxide at Portsmouth, Ohio, and Paducah, Kentucky, and fuel fabrication at existing NRC Category I, II, and III uranium fuel fabrication facilities (e.g., Westinghouse Electric Company, LLC [Westinghouse], BWX Technologies, Framatome [formerly AREVA NP], Global Nuclear Fuel – Americas, and Nuclear Fuel Service, Inc.). The commenter also mentioned that much of the HEU Disposition Program EIS can be referenced.

4.2.9 Proliferation and Terrorism Concerns

Comment Summary: DOE received 26 comments from 13 individuals, including 10 individuals representing organizations, requesting that the EIS scope include consideration of United States and international proliferation and nonproliferation concerns associated with use and misuse of HALEU and supporting technologies with implementation of the Proposed Action. One organization stated, "DOE must prepare a Nonproliferation Impact Assessment on the 'Proposed Action' and on any alternatives to it." Another organization suggested that the National Nuclear Security Administration, in coordination with DOE-NE, should assess nonproliferation and security risks associated with HALEU, its potential for expanded global use, and foster an international effort, which could be facilitated by the IAEA, to examine and address these risks. Another organization suggested the EIS needs to fully assess the increased proliferation and security risks associated with the production, processing, and use of HALEU on the scale necessary to supply power reactors.

Other commenters indicated that there were many proliferation issues associated with the use of HALEU fuel and that those issues should be considered in the EIS. The basic concern expressed was that the EIS should consider that higher enrichment of HALEU fuel made it much more likely to be misused and that the security requirements should be much higher. Several expressed concerns that the EIS should address the international implications of U.S. deployment of HALEU fuels and suggested that the NRC, the IAEA, and others initiate studies to reduce the proliferation risks.

Comment Summary: Commenters identified nuclear proliferation and terrorism concerns that uranium enriched up to 20% U-235 might be used in malicious acts. In addition, the use of uranium enriched up to 20% U-235 presents a greater incentive for further enrichment to HEU.

4.2.10 Purpose and Need

Comment Summary: Commenters stated there is no need for domestic HALEU production, and that alternatives are available. Other commenters asked DOE to justify the Purpose and Need for the program based on credible evidence or analysis that the demand for HALEU will justify the need, scope, or cost. A commenter asked where the civilian, commercial, national security, nonproliferation, and defense needs for HALEU are described in the NOI.

Comment Summary: A commenter noted that under the HALEU Availability Program, DOE is to "conduct biennial surveys of industry stakeholders to estimate the amount of HALEU needed for domestic commercial use for the subsequent 5 years." The commenter asked if DOE has conducted such a survey? If not, how does DOE know how much HALEU is needed by "industry stakeholders"?

Comment Summary: Commenters recommended that DOE's statement of Purpose and Need for the proposed agency action clearly reflect that it is the acquisition of HALEU to implement the congressionally mandated HALEU Availability Program and make HALEU available for commercial use and reactor demonstration.

Comment Summary: A commenter noted that the NOI gives several estimates for HALEU demand over the next 10 to 15 years and the annual estimates of HALEU demand by 2035 attributed to DOE and the Nuclear Energy Institute differ by more than an order of magnitude. The commenter requested that the EIS examine the underlying reasons for these differences, as well as factors affecting domestic HALEU demand, such as restrictions on foreign sources of HALEU. The commenter also requested the EIS examine the capacity of uranium enrichment, conversion/deconversion, and reactor fuel fabrication that would be necessary to meet various levels of demand and the relative increase in capacity from the current situation.

Comment Summary: A commenter asked that the EIS address whether only privately owned property will be used for commercial uranium production, conversion, enrichment, and deconversion, or whether there is the potential to use Federal properties or Tribal lands.

Comment Summary: A commenter asked that DOE provide a brief history of HALEU activities in the United States, including the issue of nuclear nonproliferation and how this issue has impacted the production of HALEU in the United States, and a summary of where the United States obtains its current supply of HALEU.

4.2.11 Regulatory Concerns

Comment Summary: A commenter stated that the Draft HALEU EIS must review the potential impact on the production of HALEU of a bill entitled, "Prohibiting Russian Uranium Imports Act," that is currently being discussed by Congress. The EIS should review the potential impact on the project of a halt or constraint on the import of Russian uranium, and the origin of domestic or foreign uranium that would be used in its place.

Comment Summary: A commenter stated that the Draft HALEU EIS must review the potential impact of the Nuclear Fuel Security Act, currently under consideration by the U.S. Senate. According to Nuclear News on May 31, 2023, "S. 452 calls for the DOE to 'expeditiously increase domestic production' of both low-enriched uranium and high-assay low-enriched uranium, aka HALEU, to 'ensure the availability of domestically produced, converted, enriched, deconverted, and reduced uranium,' and to address 'gaps and deficiencies' in that front end of the nuclear fuel cycle by 'partnering with countries that are allies or partners of the United States if domestic options are not practicable.'"

Comment Summary: A commenter stated that the Draft HALEU EIS should address whether the current regulatory process for uranium mining and processing operations is sufficient to ensure that the utilized commercial operators can responsibly operate and subsequently terminate operations without requiring that the U.S. government be financially responsible in the future (e.g., Uranium Mill Tailings Radiation Control Act of 1978 and the U.S. Army Corps of Engineers Formerly Utilized Sites Remedial Action Program).

4.2.11.1 Socioeconomics

Comment Summary: One commenter stated that "re: Socioeconomic impacts, 'potentially affected communities' are really ALL communities."

4.2.12 Tribal Consultation

Comment Summary: Several commenters stressed the importance of Tribal consultation with federally recognized Tribe as a part of the HALEU EIS. One commenter requested Tribal consultation with each Federally Recognized Tribe to ensure national coverage in the absence of known facility locations.

Comment Summary: One commenter highlighted the importance of recognizing Tribal consultation as a separate process than the Justice40 initiative. This commenter stated, "The Biden Administration's Justice40 Initiative, while welcome by underserved and disadvantaged communities, does not replace the

need for government-to-government consultation." Additionally, another commenter stressed the importance of adherence to all formal obligations during consultation procedures.

Comment Summary: Two commenters stressed the importance of consultation throughout the entire HALEU supply chain to including Proposed Action activities and Post-Proposed Action activities. These commenters also requested DOE to consult with Tribes affected by transportation routes between HALEU facilities and activity locations.

4.2.13 Support

During the HALEU EIS scoping period, DOE received 18 comments supporting the implementation of the HALEU Proposed Action. These comments of support were provided based on assumptions that HALEU could be an essential part of creating a reliable clean energy grid; ensuring national energy security; meeting national/global climate goals; preserving jobs; and/or addressing national policy concerns surrounding foreign imports of uranium.

4.2.14 Opposition

During the HALEU EIS scoping period, DOE received 1,677 comments (including 1,664 identical duplicate comments from a comment campaign) opposing the implementation of the HALEU Proposed Action. These comments of opposition were provided based on concerns of previous mismanagement of SNF, previous mismanagement of nuclear waste, lack of advanced reactor technology development, lack of a clear demand for HALEU, and concerns about proliferation.

SECTION 5
REFERENCES

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5.0 References

AEC. (1972). *Environmental Survey of Transportation of Radioactive Materials To and From Nuclear Power Plants.* Atomic Energy Commision, Directorate of Regulatory Standards. Retrieved from https://www.osti.gov/servlets/purl/4569134. December.

AEC. (1974). *Environmental Survey of the Uranium Fuel Cycle.* Atomic Energy Commission, Fuels and Materials, Directorate of Licensing. Retrieved from https://www.leidoseemg.com/haleuEIS.references/.

CEQ. (2021). *A Citizen's Guide to NEPA: Having Your Voice Heard.* Council on Environmental Quality. Retrieved from https://ceq.doe.gov/docs/get-involved/citizens-guide-to-nepa-2021.pdf.

DHS. (2019). *National Response Framework. 4th Edition.* Washington, DC: Department of Homeland Security. Retrieved from https://www.fema.gov/sites/default/files/2020-04/NRF_FinalApproved_2011028.pdf. October.

DHS. (2023). *Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plan.* Department of Homeland Security. Retrieved from https://www.leidoseemg.com/haleuEIS.references/.

DOE. (n.d.). *HALEU Availability Program webpages Frequently Asked Questions*. Retrieved August 28, 2024, from U.S. Department of Energy: https://www.energy.gov/ne/haleu-availability-program. Undated.

DOE. (2008). *DOE M 460.2-1A, Radioactive Material Transportation Practices Manual.* U.S. Department of Energy. Retrieved from https://www.directives.doe.gov/directives-documents/400-series/0460.2-DManual-1a/@@download/file.

DOE. (2021). *Spent Nuclear Fuel and Reprocessing Waste Inventory: Spent Fuel and Waste Disposition.* Prepared for U.S. Department of Energy Office of Nuclear Energy. Retrieved from https://www.leidoseemg.com/haleuEIS.references/.

DOE. (2022). *DOE O 460.2B Departmental Materials Transportation Management.* U.S. Department of Energy. Retrieved from https://www.directives.doe.gov/directives-documents/400-series/0460.2-BOrder-b/@@images/file.

International Energy Agency. (2021). *Net Zero by 2050 A Roadmap for the Global Energy Sector.* Retrieved from https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroby2050-ARoadmapfortheGlobalEnergySector_CORR.pdf.

Kemp et al. (2024). Kemp, R. S., Lyman, E. S., Deinert, M. R., Garwin, R. L., & von Hippel, F. N. The weapons potential of high-assay low-enriched uranium. *Science, 384*(6700), 1071-1073. Retrieved from https://www.leidoseemg.com/haleuEIS.references/.

Leidos. (2023). *Technical Report in Support of the Environmental Impact Statement for DOE Activities in Support of Commercialization of High-Assay Low-Enriched Uranium Fuel Production.* Prepared by Leidos for U.S. Department of Energy Idaho Operations. Retrieved from https://www.leidoseemg.com/haleuEIS.references/.

NAS. (2023). *Merits and Viability of Different Nuclear Fuel Cycles and Technology Options and the Waste Aspects of Advanced Nuclear Reactors.* Washington, D.C.: The National Academies Press. National Academies of Sciences, Engineering, and Medicine. https://nap.nationalacademies.org/catalog/26500/merits-and-viability-of-different-nuclear-fuel-cycles-and-technology-options-and-the-waste-aspects-of-advanced-nuclear-reactors.

NRC. (1975). *Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants: Supplement I.* U.S. Nuclear Regulatory Commission. NUREG-75/038. Retrieved from https://www.nrc.gov/docs/ML1409/ML14091A176.pdf.

NRC. (1977). *Final Environmental Impact Statement on the Transportation of Radioactive Materials by Air and Other Modes, NUREG 0170 , December.* Washington, DC: U.S. Nuclear Regulatory Commission, Office of Standards Development. Retrieved from https://www.leidoseemg.com/haleuEIS.references/.

NRC. (2023a). *Fuel Cycle: Physical Security Requirements for Facilities with Category II Quantities of Special Nuclear Material Informational Sheet.* U.S. Nuclear Regulatory Commission. Retrieved from https://www.nrc.gov/reactors/new-reactors/advanced/rulemaking-and-guidance/fuel-cycle.html.

NRC. (2023b). Certificate of Compliance for Radioactive Material Packages - Safety Analysis Report for the DN30-X Package. 0045-BSH-2020-001-Rev.3. Docket No. 71-9388, USA/9362/AF-96, Rev. 0, March 27. Nuclear Regulatory Commission. Retrieved from https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML23083B978.

USDA. (2013). *Draft Environmental Impact Statement for Roca Honda Mine Sections 9, 10 and 16, Township 13 North, Range 8 West, New Mexico Principal Meridian, Cibola National Forest, McKinley and Cibola Counties, New Mexico.* U.S. Department of Agriculture, U.S. Forest Service Southwestern Region. MB-R3-03-25. https://www.govinfo.gov/content/pkg/GOVPUB-A13-PURL-gpo40498/pdf/GOVPUB-A13-PURL-gpo40498.pdf.

USDOT. (2024). *Emergency Response Guidebook.* Washington, DC: U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration. Retrieved from https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2024-04/ERG2024-Eng-Web-a.pdf.