Citizens Advisory Board

Idaho National Engineering and Environmental Laboratory

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EIS001230

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Ms. Wendy Dixon, EIS Program Manager
U.S. Department of Energy Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 30307, M/S 010
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Dear Ms. Dixon:

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Note: The Site-Specific Advisory Board for the Idaho National Engineering and Environmental Laboratory (INEEL), also known as the INEEL Citizens Advisory Board (CAB), is a local advisory committee chartered under the Department of Energy's (DOE) Environmental Management SSAB Federal Advisory Committee Act Charter.

The INEEL CAB reviewed the Draft Environmental Impact Statement (EIS) for a Geologic Repository for Spent Nuclear Fuel and High-Level Waste, Nye County, Nevada. The enclosed recommendation, INEEL CAB Recommendation #66, was reached through consensus at our January 2000 meeting. It is submitted in response to the DOE's invitation to comment on the Draft EIS during the public comment period that will end February 9, 2000.

We commend the Department's recognition of the importance of public comment on this decision of National significance, as evidenced by the 180-day public comment period.

We await your response to this recommendation and look forward to receiving the Final EIS.

Sincerely,

Charles Rice, Chair
INEEL CAB

cc: Dieter Knecht, INEEL CAB Spent Nuclear Fuel Committee Chair
Beverly Cook, DOE-ID
Carolyn Huntoon, DOE-HQ
Martha Crosland, DOE-HQ
Fred Butterfield, DOE-HQ
Governor Dirk Kempthorne
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Citizens Advisory Board
Idaho National Engineering and Environmental Laboratory

Draft Environmental Impact Statement for a Geologic Repository for Spent Nuclear Fuel and High-Level Waste, Nye County, Nevada

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The Idaho National Engineering and Environmental Laboratory (INEEL) Citizens Advisory Board (CAB) reviewed the Draft Environmental Impact Statement (EIS) for a Geologic Repository for Spent Nuclear Fuel and High-Level Waste, Nye County, Nevada.

The INEEL CAB supports the Federal commitment to permanently dispose of spent nuclear fuel (SNF) and high-level radioactive waste (HLW), as articulated in the Nuclear Waste Policy Act enacted in 1982 by the U.S. Congress. We understand from Section S.2.1, "Purpose and Need" of the Draft EIS that: "Congress affirmed that the Federal Government is responsible for the permanent disposal of spent nuclear fuel and high-level radioactive waste." We further understand from the "Overview" Section that the purpose of the EIS is "to provide information on potential environmental impacts that could result from a Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at the Yucca Mountain site."

1 The INEEL CAB supports the Proposed Action analyzed in the Draft EIS, but we do recommend that the EIS be modified (as described herein) in order to ensure that it will provide adequate environmental documentation to support future decision making. Our comments and recommendations for improving the Draft EIS follow.

2... *Metric Tons of Heavy Metal*

The Nuclear Waste Policy Act was enacted in 1982 for the purpose of developing a geologic repository to protect the population and the environment from the hazards of radioactive waste. The Nuclear Waste Policy Act limited the amount of SNF and HLW to 70,000 metric tons of heavy metal (MTHM) that could be placed in the Nation's first geologic repository until a second repository could become operational.[1] The limitation was meant to provide "regional equity" among potential repository sites.

We understand that the material that could eventually go to the geologic repository includes civilian SNF (from commercial nuclear powerplants), DOE SNF (from DOE production reactors, naval reactors, and experimental reactors), and DOE HLW[2] (primarily waste that resulted from the chemical extraction of weapons-usable materials from defense SNF). In order to project the impacts that would result from the geologic repository, DOE must determine the quantities and characteristics of each of the three materials that would be disposed.

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[1] The Draft EIS explains that: 1) quantities of SNF are traditionally expressed in terms of metric tons of heavy metal, not including other materials such as cladding and structural materials, 2) a metric ton is 1,000 kilograms or 2,200 pounds, and 3) uranium and plutonium are called heavy metals because they are extremely dense.

[2] Including HLW from West Valley

2 cont. DOE determined that 90% (63,000 MTHM) of the 70,000 MTHM (allowed into the geologic repository) would be allocated for commercial SNF and the remaining 10% (7,000 MTHM) for DOE SNF and HLW. It has further been determined that 33% of the DOE's allotment (2,334 MTHM) would be allocated for DOE-owned SNF and 67% (4,666 MTHM) for HLW.

Calculation of the MTHM of SNF is relatively straightforward, based on the actual heavy metal content of the SNF. Calculation of the equivalent MTHM for HLW (which was not specified by Congress) is somewhat more complicated, however, and will affect the quantity of waste that can be accepted into the geologic repository. Both commercial SNF and DOE HLW contain the radioactive elements that are formed in a nuclear reactor. However, DOE SNF was generally retained in the reactor for a much shorter time than is the case for a comparable amount of commercial SNF. Because the amount of waste that is produced in SNF is dependent upon the length of time it stays in the reactor, much less radioactive waste material was produced per metric ton of DOE SNF compared to waste produced per metric ton of commercial SNF. In addition, DOE's HLW consists only of the radioactive waste elements, which were separated from DOE SNF using a technology known as reprocessing, and no longer includes the heavy metals. Because of these differences, we recommend that the most consistent and comparable measure for comparing HLW with SNF is in terms of an "equivalent MTHM"—or the quantity of HLW that would produce the same radioactivity or radiotoxicity as a metric ton of SNF.

In the Draft EIS, impacts are evaluated using a method for calculating MTHM equivalence based on historical projections of radioactivity in HLW. Those historical projections are no longer valid, however, because the radioactivity levels in HLW now being produced are significantly lower. If the historical projections method is applied, the level of radioactivity that would result from each MTHM of HLW disposed in the geologic repository would be significantly lower than the level of radioactivity that would result from each MTHM of commercial SNF disposed. We believe there is no scientific basis for this inequitable and overly restrictive approach. In addition, the geologic repository capacity restriction of 4,666 MTHM for HLW will be inadequate to accommodate all of the HLW under DOE's purview if DOE uses the historical projections method.

This dilemma is recognized in Appendix A of the Draft EIS through the discussion of the methods for calculating MTHM. One method, the Total Radioactivity Method, would establish equivalence based on a comparison of the radioactivity inventory (curies) of HLW to the average curies found in a metric ton of commercial SNF. The second, the Radiotoxicity Method, would involve calculation of the "relative radiotoxicity" (based on the inventory of specific radionuclides present and their respective regulatory release limits). Using either of these two methods for calculating the MTHM equivalency for HLW would allow a more equitable allocation of storage space in the geologic repository between the commercial and DOE materials. Both of these alternative methods would allow DOE to dispose of all of its HLW at the geologic repository, without exceeding maximum limits established by Congress.

Accordingly, the INEEL CAB recommends that DOE adopt either the total radioactivity method or the radiotoxicity method in this EIS as a more equitable and scientifically justifiable estimate of equivalent MTHM for the inventory of HLW. This approach would pose no additional risk to human health and the environment (above the risks evaluated in the Draft EIS). It would also reduce risks and costs associated with managing those risks at the sites where the undisposed HLW would remain, pending development of another repository at some undetermined point in the future.

2 cont. *Hazardous Constituents*

Under its current design, the geologic repository will accept no waste with hazardous constituents as defined by the Resource Conservation and Recovery Act (RCRA). However, the DOE-owned HLW that is currently at INEEL contains listed hazardous constituents and is classified as "RCRA hazardous."[3] In order for the HLW presently at INEEL to be disposed at the proposed geologic repository, various additional activities would have to occur. The INEEL CAB is concerned that the Draft EIS does not address what actions would be required to dispose of HLW that contains listed hazardous constituents, the impacts of those actions, nor the impacts of disposing those wastes at the proposed geologic repository. We note that these wastes constitute a significant portion of the HLW under DOE's control, and that DOE is responsible for permanent disposal of the entire inventory of HLW under the Nuclear Waste Policy Act.

Under the current regulatory framework, two options exist that could allow eventual disposal of these hazardous wastes at the proposed geologic repository at some point in the future. DOE could decide to seek a permit for the geologic repository as a disposal facility under RCRA. Such a permit would require approval by the State of Nevada (as the State has regulatory authority under RCRA within that state). Alternatively, DOE could seek to have the HLW with hazardous constituents "delisted" (following treatment) to allow their disposal in the geologic repository. That strategy would require documentation of the treatment methodology and extensive coordination among the states of Nevada and Idaho and two regions of the U.S. Environmental Protection Agency. Both strategies could prove difficult to implement. **Nevertheless, the INEEL CAB recommends that DOE evaluate the Proposed Action in the Final EIS based on an assumption that all of the HLW with hazardous constituents will eventually go to the geologic repository for permanent disposal.** This approach would allow development of environmental documentation that could support follow-on decision-making should DOE eventually overcome the challenges to acceptance of hazardous constituents at the geologic repository.

Closure of the Geologic Repository

3 The Draft EIS describes the Proposed Action ending with closure of the proposed geologic repository by 2033. The Idaho Settlement Agreement requires that DOE complete treatment of all HLW at INEEL, making it "road-ready" by the year 2035. The Draft EIS for Idaho's HLW and Facilities Disposition (HLW EIS), written in compliance with the Idaho Settlement Agreement, will allow meeting the 2035 deadline. **As the geologic repository closure date is not specified by the Nuclear Waste Policy Act, the INEEL CAB recommends that it be extended to allow for acceptance of the INEEL's HLW.**

Waste Acceptance Requirements

The DOE has begun specifying repository waste acceptance requirements for HLW from Savannah River and Hanford as well as other DOE SNF (in the Waste Acceptance Systems Requirements Document). Those requirements have been modified as more is known about the characteristics of the wastes after treatment. **The INEEL CAB recommends that DOE further modify the Waste Acceptance Systems Requirements Document to accommodate the INEEL HLW forms described in the Draft HLW EIS.**

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[3] HLW currently at Savannah River Site does not contain hazardous constituents and is believed to be acceptable at the geologic repository.

4 *Full Analysis*

According to the "Purpose and Need for Action," in the Draft EIS, this EIS is being prepared to support DOE decision-making related to the Federal Government's responsibility for permanent disposal of all SNF and HLW. **Therefore, the INEEL CAB recommends that each alternative include a full description of what would be done to manage the entire inventory of SNF and HLW, including any portions that would not be disposed at the geologic repository for any reason. In addition, the description of impacts under each alternative should include those impacts that would result from ongoing management of those wastes (any not disposed at the geologic repository) at their present locations.**

Conclusions Regarding Our Recommendations for Changes to the EIS

If DOE incorporates all of the above recommendations, the Final EIS will:

- Support informed decision making regarding future management of all SNF and HLW, in accordance with the federal government's responsibilities under the Nuclear Waste Policy Act,
- Allow the design of the geologic repository to accommodate all of the SNF and HLW in DOE's inventory (within the capacity limitations specified in the Nuclear Waste Policy Act), and
- Preclude the need for further environmental documentation under the National Environmental Policy Act, as the Final EIS would provide bounding estimates of the impacts of the geologic repository and other reasonable management alternatives for the entire inventory of SNF and HLW under DOE management.

5 *Alternatives Evaluated*

The two no-action alternatives considered for continued storage and management of SNF and HLW in existing facilities are completely unacceptable because of the risks posed by the wastes to human health and the environment and the exorbitant costs that would be associated with responsible management of those risks. Assuming that the additional analysis recommended above doesn't result in significant additional impacts under the Proposed Action, the INEEL CAB supports construction, operation and monitoring, and eventual closure of a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at the proposed geologic repository site.

6 **One final note:** the INEEL CAB commends DOE on the detailed descriptive information about SNF and HLW (including quantities and characteristics) as compiled in Appendix A to the Draft EIS (and cited references). Such a compilation is a significant improvement over other DOE environmental documentation and Integrated Data Base reports. The data should be incorporated into other databases, such as the one currently being prepared to support DOE's stewardship planning.