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OSTIENVIRONMENTAL IMPACT STATEMENT FOR INITIATION OF
TRANSURANIC WASTE DISPOSAL AT THE WASTE ISOLATION PILOT PLANT

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ABSTRACT

The long-standing mission of the Waste Isolation Pilot Plant (WIPP) is to demonstrate the safe disposal of transuranic (TRU) waste resulting from United States defense activities. In 1980, to comply with the National Environmental Policy Act, the U.S. Department of Energy (DOE) completed its first environmental impact statement which compared the impacts of several alternatives for transuranic (TRU) waste disposal. Based on the 1980 analyses, the DOE decided to proceed with the construction of the WIPP facility in 1981. In a 1990 decision based on the examination of alternatives in a 1990 Supplemental Environmental Impact Statement, the DOE decided to continue development of the WIPP by proceeding with a testing program to further examine WIPP's suitability as a TRU waste repository.

Now, as the DOE's Carlsbad Area Office (CAO) attempts to complete its regulatory obligations to begin WIPP disposal operations, the CAO is developing the WIPP's second supplemental environmental impact statement (SEIS-II). To complete the SEIS-II the CAO will have to successfully rise to a number of challenges. This paper explores both the past and present environmental impact statements prepared to evaluate the suitability of WIPP. Several challenges associated with completing an objective comparison of alternatives, while simultaneously finalizing other critical-path compliance documents; controlling costs, and keeping stakeholders involved during the decision-making process are addressed.

DISPOSAL DILEMMA

Prior to 1970, the U.S. Department of Energy (DOE) buried its transuranic (TRU) waste resulting from U.S. defense activities along with low-level waste in shallow trenches without planning to retrieve it. TRU waste is radioactive waste that, without regard to source or form, is contaminated with alpha-emitting TRU radionuclides having atomic numbers larger than 92 and half-lives longer than 20 years in concentrations greater than 100 nanocuries per gram of waste.

In 1970, the U.S. Atomic Energy Commission, a DOE predecessor, required that TRU waste be placed in containers that could be retrieved from storage, contamination free, within 20 years. Since that time TRU waste has been placed in retrievable storage pending shipment to a permanent geologic repository. DOE is currently storing TRU waste at sites where it was generated until a permanent storage facility becomes operational.

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In 1980, the U.S. Congress passed "The National Security and Military Applications of Nuclear Energy Act of 1980 (Public Law 96-164)" which authorized the DOE to develop a research and development facility to demonstrate the safe disposal of radioactive waste that has resulted or will result from defense activities and that is exempted from regulation by the Nuclear Regulatory Commission. That research and development facility is the Waste Isolation Pilot Plant, also known as the WIPP site. WIPP is located in southeastern New Mexico about 26 miles east of the town of Carlsbad.

HISTORICAL EVALUATION OF THE WIPP SITE

From the late 1970s to date, the DOE and its regulators have scrutinized the facility to determine whether WIPP can meet applicable environmental and safety standards required to demonstrate its ability to isolate TRU waste for thousands of years to come. In 1980, following several years of arduous site selection, the DOE completed its first comprehensive environmental impact statement [1] which compared the impacts of several alternatives for TRU waste disposition. In the United States, an environmental impact statement (EIS) must be prepared whenever a federal agency proposes an action that is likely to significantly affect the environment. The law under which environmental impact statements are prepared is the National Environmental Policy Act (NEPA) as interpreted by the Council on Environmental Quality (CEQ). Preparation of a thorough EIS contributes to agency decision-making by providing information about the likely impacts of its proposed action. Federal agencies are also required to solicit public comments before and during the EIS preparation process.

At the heart of each environmental impact statement is a detailed comparison of reasonable alternatives, i.e., those alternatives that might reasonably be expected to satisfy the agency's purpose and need for action. The CEQ's regulations require that along with an evaluation of reasonable alternatives, the impacts of the "No Action" alternative be considered to establish a baseline of impacts that might occur if the agency were to do nothing [2].

The 1980 EIS explored several alternatives and subalternatives to addressing the national TRU waste disposal problem. The following were the primary alternatives considered:

- The No-Action Alternative - A research and development facility would not be developed and post-1970 TRU waste would continue to be retrievably stored
- Developing the WIPP in southeastern New Mexico
- Disposing TRU waste in the first available repository for high-level radioactive waste.

Alternative disposal methods to deep geologic disposal were also considered, but rejected as impractical. These included emplacement in deep ocean sediments, emplacement in very deep drill holes, transmutation, and ejection into space. The No-Action alternative was also rejected because it would leave TRU waste exposed to possible volcanic action or human intrusion. In January 1981, based on the analysis in the first EIS the DOE decided to proceed with the development of the WIPP site [3].

CEQ regulations dictate that a supplemental EIS must be prepared whenever the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts [4]. In 1990, DOE issued a supplemental EIS (SEIS) [5] to analyze potential environmental impacts resulting from "new information or changed circumstances." These changed circumstances included the elimination of planned experiments with high-level radioactive waste, and the introduction of phased experiments, i.e., conducting a thorough test phase in the WIPP underground prior to initiating disposal operations.

Alternatives considered in the WIPP's first SEIS included:

- The No-Action Alternative - No waste would be emplaced at WIPP. Storage of TRU waste would continue at the generator sites, and new storage facilities would have to be built.
- Continue with a phased approach to develop WIPP, as authorized by Public Law 96-164 and modified by changes proposed by beginning the WIPP Test Phase.
- Only those tests that could be performed without emplacing waste underground would be conducted until it is determined that WIPP complies with Environmental Protection Agency standards and other regulatory requirements for the long-term protection of the environment from the disposal of TRU waste.

In its June 1990 Record of Decision [6] DOE announced its decision to continue the phased development of the WIPP, and committed to preparing a second supplemental environmental impact statement prior to beginning WIPP disposal operations. The DOE was to conduct test phase activities in the WIPP underground facility to demonstrate compliance with applicable radioactive disposal regulations, but in October 1993 DOE announced that it would conduct tests in above-ground laboratories rather than the WIPP's underground facility. This decision was made to save time and costs while obtaining comparable test results [7].

SECOND SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

DOE is now proposing to continue the phased development of WIPP by beginning the disposal of defense-related TRU waste. To satisfy CEQ requirements and the commitment made in the 1990 ROD, the DOE Carlsbad Area Office (CAO) has begun preparing a second supplemental environmental impact statement (SEIS-II). The SEIS-II will examine the impacts of pertinent "new information or changed circumstances" relative to WIPP disposal operations that have become apparent since 1990. It will build on previous NEPA documentation prepared for WIPP and will use environmental data currently available such as performance assessments, technical progress reports, and updates to safety analysis reports.

ALTERNATIVES

The following alternatives are being considered in the SEIS-II:

- No Action Alternative 1 - WIPP would be dismantled and closed. The waste would be treated and packaged in accordance with applicable regulations, and then be consolidated and stored in new monitored retrievable storage facilities at consolidation sites indefinitely.
- No-Action Alternative 2 - WIPP would be dismantled and closed. TRU waste would be packaged and treated to meet the current planning basis waste acceptance criteria (WAC), then continue to be stored at the generator sites.
- Continue with the phased development of WIPP by beginning the disposal phase of TRU waste operations at the facility. WIPP would dispose of newly generated TRU waste and post-1970 defense-related TRU waste treated to planning basis WAC that is in retrievable storage in the DOE complex over a 35-year operating lifetime.
- Continue with the phased development of WIPP by beginning the disposal phase of TRU waste operations at the facility. WIPP would accept for disposal ALL TRU waste that is owned or controlled by DOE treated to planning basis WAC, including the non-defense related, commercial, and pre-1970 buried waste.
- Continue with the phased development of WIPP by beginning the disposal phase of TRU waste operations at the facility. WIPP would dispose of newly generated TRU waste and post-1970 defense-related TRU waste that is in retrievable storage in the DOE complex. All TRU waste would be treated thermally to meet the Land Disposal Restrictions for mixed TRU waste.
- Continue with the phased development of WIPP by beginning the disposal phase of TRU waste operations at the facility. WIPP would dispose of newly generated TRU waste and post-1970 defense-related TRU waste that is in retrievable storage in the DOE complex. All TRU waste would be treated by a shred and grout process.

The No-Action alternatives will provide a baseline against which the impacts of each of the other alternatives can be compared. Particular issues of importance to be analyzed in the SEIS-II include:

- Potential effects on the public and on-site workers from releases of radiological and non-radiological materials
- Potential effects on soil, air, and water quality and other environmental consequences during normal operations and reasonably foreseeable accidents
- Potential cumulative effects during operations at the WIPP site
- Potential effects on endangered or threatened species, other species of concern and archaeological sites
- Potential effects from normal transportation and reasonably foreseeable transportation accidents

- Environmental justice considerations
- Unavoidable adverse environmental effects
- Short-term uses of the environment versus long-term productivity
- Potential irretrievable and irreversible commitments of resources

CHALLENGES FOR EVALUATING REASONABLE ALTERNATIVES

For the SEIS-II, the major challenge will not be performing the analysis, but presenting the results of the analysis succinctly and understandably. Two important CEQ requirements for EISs are that they be presented within a reasonable number of pages (150-300 pages) and in "plain language." EISs should not drown people in lengthy dissertations consisting primarily of "technospeak." Instead, technical and lay people alike should be able to use the EIS as a tool to evaluate the proposed federal action for themselves.

Separating Alternatives

For the SEIS-II the DOE has decided to separately analyze the impacts of contact-handled and remote-handled TRU waste and to further separately analyze the waste that would be disposed under the proposed action and the additional waste included in the remaining action alternatives. This decision has effectively transformed the proposed action and three action alternatives into 14 subalternatives for analysis. The challenge posed by presenting the results of 14 separate analyses in a form that can be easily digested and understood by the public is formidable. The current plan is for the SEIS-II to present a tabular summary of the impacts for comparison, but even that could prove unwieldy because the large amount of information cannot easily be summarized in one table.

Characterizing Certainty Versus Uncertainty

Another challenge in presenting the impacts in the SEIS-II is properly characterizing the level of uncertainty inherent in the analysis. Geologic and hydrologic properties are important factors in WIPP's performance. More than most types of information, these properties are difficult to determine with certainty. This is especially true at the WIPP because groundwater is scarce and moves very slowly. In short, the very factors that tend to make WIPP suitable as a repository make it difficult to determine how it would behave as a repository. Even when the behavior of a geologic formation is well understood, the mechanisms that govern that behavior may still be the subject of dispute. This relative lack of certainty (when compared to that usually expected from other scientific disciplines) regarding the behavior of WIPP as a repository has been seized on by WIPP detractors as a reason for not proceeding with TRU waste disposal. The SEIS-II preparers are faced with the task of explaining why, despite the inherent uncertainties, the DOE has a high degree of confidence that the WIPP repository will perform as expected to isolate the waste for long time periods.

Environmental Justice Considerations

Still another potential challenge for the SEIS-II analysts is posed by an Executive Order requirement that the SEIS-II address environmental justice concerns. Environmental justice issues are those that arise when poor or minority populations are adversely impacted to a greater degree than other populations by a particular action. Environmental impact statements have always considered the potential socioeconomic impacts of proposed actions. In 1994, President William J. Clinton issued an Executive Order entitled, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" [8]. In the accompanying memorandum, he stated that all NEPA documents should address "significant and adverse environmental effects of proposed Federal actions on minority communities and low-income communities."

Because the evaluation of environmental justice impacts is relatively new, standards for such evaluations have not been fully established. Also, some potential environmental justice issues are particularly difficult to recognize, because many minority groups, particularly Native American populations, have nontraditional viewpoints and perceive impacts differently. Historically, environmental impact statements have focused on physical impacts, not psychological impacts (particularly those that disproportionately affect one segment of the population because of their cultural beliefs). The SEIS-II preparers must be aware of potential psychological impacts that might come about due to initiating WIPP disposal operations, and be prepared to address them if necessary within the context of environmental justice.

The approach that will be taken to address each of the aforementioned challenges in the SEIS-II has not yet been fully defined, but the SEIS-II preparers will have to deal with these issues candidly in preparing a document that is sufficient to support the DOE's decision whether to begin TRU waste disposal operations at the WIPP.

CHALLENGES FOR COMPLETING A QUALITY STATEMENT

Doing More for Less

All government agencies are faced with doing more for less, and the DOE is no exception. In June of 1994, the Secretary of Energy, Hazel R. O'Leary, issued "The Secretarial Policy on the National Environmental Policy Act" [9]. Her proclamation challenged the DOE to minimize costs and the time required for EIS preparation and review. The policy introduced numerous reforms including the requirement that the median preparation time for DOE EISs would be reduced to 15 months, with no decline in quality.

To meet the goals set forth by the Secretarial NEPA Policy, the CAO will have to successfully rise to a number of challenges. Beyond completing a technically sound analysis of the proposed action and its reasonable alternatives the CAO will have to prepare the SEIS-II, while simultaneously finalizing other critical-path, compliance documents, control the SEIS-II costs, while pursuing timely completion, and ensure that WIPP's stakeholders are offered ample opportunities for involvement in the process.

Simultaneous Development of Compliance Documents

Between now and October of 1997, the CAO intends to prepare and obtain regulatory approval for several compliance documents. Major compliance documents include:

- No-Migration Variance Petition
- Resource Conservation and Recovery Act Part B Application
- 40 CFR 191 Compliance Certification Application.

Without explicit coordination and planning, concurrent document preparation could present a stumbling block to reaching an expeditious, disposal decision. Coordinating the flow of information is not an easy task. Using the most current information and analyses as they become available will be crucial to make the SEIS-II a quality, decision-making document.

The SEIS-II team is reviewing data from WIPP's other compliance documents and studies as they are developed to "feed" the SEIS-II analysis. As new data become available, preparation team members glean information, and review it within the context of the EIS.

Controlling the SEIS-II Schedule And Costs

Controlling costs and compressing the schedule for EIS development will be especially demanding for the CAO. The SEIS-II will examine environmental impacts throughout the DOE complex and discuss issues that generate interest, and sometimes heated debate throughout the United States. To control costs and keep the analysis on schedule, the CAO is pursuing a number of strategies. The following are expected to be the most effective.

Extensive use of information contained in other available WIPP studies and compliance documents. For the SEIS-II extensive use of "boilerplate information" was planned to avoid rewriting or reanalyzing topics already covered within another report. Examples of documents being used to capture existing information include the WIPP's Annual Site Environmental Report [10], and the draft EM Programmatic Environmental Impact Statement [11].

Cohesive DOE Management/Review Team. The CAO is relying on a cohesive, DOE management/review team to assist in controlling SEIS-II schedule and costs. The team is comprised of staff-level personnel from the CAO and various branches of the DOE Headquarters who are responsible for reviewing and approving the SEIS-II during all phases of its development. The management/review team is working to assure that a high quality document is prepared and that it is consistent with DOE's programmatic policies. The management team has and will continue to concurrently review key portions of the SEIS-II so that the most is made of each month allowed for document preparation on the schedule.

Reducing Travel Expenses. To reduce travel expenses, the SEIS-II public outreach team used community centers whenever possible for stakeholder meetings. The document preparation team uses phone and video conferences in place of face-to-face meetings whenever feasible. These measures allow participants from New Mexico, Washington, and Washington D.C. to interface regularly at reduced cost.

Review of Mitigation Commitments. The CAO is obligated to assure that mitigation-measure benefits are commensurate with their costs. Therefore, each mitigation commitment will be carefully reviewed before it is recommended for inclusion in the ROD. This will ensure that necessary precautions are taken for the protection of the workers, the public, and the environment, and that the maximum value is added for mitigation dollars spent.

Ensuring Stakeholder Involvement

Ensuring ample opportunity in the DOE's decision-making process is of critical importance to the CAO. Following the issuance of the Notice of Intent in August 1995 [12], the CAO began working with the public outreach team in earnest, preparing the participants to become less threatening, less bureaucratic, and more responsive to public concerns. Training sessions were conducted for potential public outreach team members, and a format was set for public meetings that would encourage and stimulate comments.

Two of the topics emphasized during the training [13] were the importance of being an active listener and not a lobbyist. CAO representatives were urged to view stakeholders opposed to WIPP not as adversaries, but rather as individuals who are genuinely concerned about the problems posed by TRU waste disposal.

To further involve WIPP's stakeholders, CAO is circulating a "Stakeholder Consultation and Coordination Plan for Public Comment and Hearings." This is providing stakeholders the opportunity to influence the number and format for the public hearings that will be held on the draft SEIS-II.

CONCLUSION

The importance of successfully completing the task of obtaining regulatory and scientific approvals necessary to operate the WIPP are illustrated in a 1995 congressional task force report entitled "The Top 20 Ways to Turbocharge DOE Cleanup" [14]. In it, task force members made the following statements:

The WIPP is a world-class facility designed specifically for the management of transuranic waste. Unfortunately, it presently sits idle. The facility costs American taxpayers millions of dollars to maintain, while related testing and regulatory hurdles are ongoing. Failure to open WIPP also costs taxpayers millions in related storage, inspections, and monitoring for waste destined for shipment to the WIPP, but which currently remain stored at numerous sites around the country. It's time to open this critical facility.

The DOE has invested several years in meeting compliance hurdles and increasing its scientific awareness of the WIPP's expected repository behavior. With the completion of the SEIS-II analysis and the WIPP's other final compliance documents the CAO hopes to employ a long-awaited solution for its TRU waste disposal problem.

CAO is dedicated to making the SEIS-II a thorough, quality environmental impact statement. The challenges associated with this task are unique, but manageable. The CAO, together with DOE Headquarters representatives, its contractors, and stakeholders will assure that the SEIS-II

decision is sound, timely, and cost effective, and that the public is given the opportunity to be involved in the DOE decision-making process.

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