

## THE WASTE ISOLATION PILOT PLANT: A NEW REGULATORY AND INSTITUTIONAL ENVIRONMENT

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### ABSTRACT

The U.S. Department of Energy (DOE) is ready to embark on a multi-year test program, using radioactive waste, at the Waste Isolation Pilot Plant (WIPP). WIPP is a deep geologic repository, constructed in ancient salt beds in southeastern New Mexico. It was authorized by Congress in 1979 as a research and development (R&D) facility to demonstrate safe disposal of the nation's defense transuranic waste.

While nonradioactive testing in the repository has been underway for several years, it is now necessary to conduct underground tests with small amounts of radioactive waste. Radioactive waste testing in an actual repository environment (using a volume limit of 0.5% of WIPP's design capacity of transuranic wastes and mixed hazardous/transuranic wastes) will reduce uncertainties associated with long-term repository performance assessments, which are required to determine compliance with long-term disposal standards.

However, authority for DOE to begin this new phase of the test program no longer resides within the Department. The passage of the WIPP Land Withdrawal Act, P.L. 102-579, signed on October 30, 1992, resulted in a new regulatory and institutional environment for WIPP. WIPP is now subject to formal regulatory oversight by the Environmental Protection Agency (EPA), who is responsible for certifying WIPP's compliance with disposal standards. The Act also provides approval, certification and review roles for six other Federal agencies on various aspects of the WIPP program, as well as formal oversight roles by independent review groups such as the National Academy of Sciences, the Environmental Evaluation Group, and the State of New Mexico. The general public has an increased role through its participation in various rule-makings required by the Act.

With this increasing level of involvement by independent agencies and groups, the suitability of WIPP can be determined with a greater level of public confidence. This paper discusses the new regulatory and institutional environment surrounding the WIPP program.

### BACKGROUND

Since the mid 1970s the characteristics of the WIPP site have been studied, resulting in more than 18 years of data on the project. Non-radioactive tests have been underway at WIPP since the early 1980s. These tests include laboratory, modeling, and field studies in rock mechanics, sealing systems, salt bed studies and other rock formation studies. To date, more than 100 bore-holes, drilled at a depth ranging from 200 feet to 6500 feet, have provided data on the characteristics of the WIPP site.

WIPP is now ready to begin underground experiments at WIPP with small amounts of transuranic waste. Radioactive waste testing in an actual repository environment is necessary to reduce the uncertainties associated with performance assessments required to demonstrate compliance with long-term disposal regulations. These regulations include the following:

- Radioactive waste disposal regulations at 40 CFR 191, Subparts B and C (which are now being proposed by EPA). These regulations will contain 10,000-year curie limits for specific radionuclides, individual protection dose limits, and groundwater protection dose limits.
- Hazardous waste regulations under the Resource Conservation and Recovery Act (RCRA). 40 CFR 268 requires a No-Migration Determination to assure no migration of hazardous constituents as long as the wastes remain hazardous. 40 CFR 264, Subpart

X, requires permitting of the facility for disposal operations.

WIPP's designation as a disposal facility is dependent upon demonstrated compliance with these regulations.

Radioactive tests will be accomplished with small amounts of transuranic wastes (including mixed transuranic/hazardous wastes), starting with test bin shipments from the Idaho National Engineering Laboratory (INEL) and the Rocky Flats Plant. The volume of Test Phase waste to be shipped to WIPP is 0.5% of WIPP's design capacity, as set forth in Congressional legislation. The radioactive tests will include the following:

- Bin Tests, which will provide information on gas generation to reduce model uncertainties. Bin tests will be conducted in the WIPP underground test rooms using a phased approach (dry, humid, and inundated). These tests will involve a *minimum* of 95 drum-equivalents of waste over a 5-to-7 year period. As of this writing, 6 bins are loaded at INEL and ready for shipment to begin the Test Phase.
- Source Term Tests, which will measure concentrations of radionuclides and hazardous constituents in brine. These tests will be conducted at Los Alamos National Laboratory and will involve about 20 drum-equivalents of waste.
- Alcove Tests, which will collect data on volatile organic compounds and other gases in order to reduce uncertainties from headspace sampling. These tests will be conducted in the WIPP underground in rooms

that simulate a real repository environment. Alcove tests will involve a minimum of 1,000 drum-equivalents of waste.

The WIPP Land Withdrawal Act (P.L. 102-579) resolved a key issue raised in a lawsuit by permanently withdrawing the public lands surrounding WIPP and authorizing the Test Phase with radioactive waste, given that certain prerequisites are completed. But more importantly, the Act sets forth about 140 separate requirements for the start and conduct of the Test Phase, Disposal Phase and Decommissioning Phase of the WIPP Project. Of these new requirements, 80% are new requirements for DOE and seven other Federal agencies.

DOE is working diligently with each of the agencies to assure that all of the Act's requirements will be met within the mandated time-frames. Given the requirements contained in the Act, the earliest that Test Phase shipments can begin, as of this writing, is August 1993. Below is a summary of the major requirements in the Act.

#### PREREQUISITES TO STARTING THE TEST PHASE WITH WASTE

The Act established certain requirements that must be met before the new Test Phase can begin. These include the following:

- EPA Issuance of Final Disposal Regulations. EPA must issue final disposal regulations under 40 CFR 191, Subpart B, within six months from the date of enactment (April 30, 1993).

While the Act reinstated those portions of 40 CFR 191, Subpart B, that were not the subjects of the Court's remand in 1987, it requires that the groundwater protection and individual protection requirements, which were the subject of the Court's remand, be repromulgated. As of this writing, EPA is ready to propose its revised regulations, including a new Subpart C containing the groundwater protection requirements, which will be consistent with the Safe Drinking Water Act.

- EPA Approval of Test Phase Plan and Waste Retrieval Plan. DOE must submit to EPA its Test Phase Plan and Waste Retrieval Plan within seven months of enactment (May 30, 1993). EPA must approve the plans, by rule-making, within 10 months of enactment (August 30, 1993).

Drafts of these plans were submitted for review in 1990 to EPA, NAS, the Environmental Evaluation Group, and the State of New Mexico in 1990. However, the Act places an unprecedented level of formal review and approval by EPA on what was traditionally viewed as internal DOE planning documents. By requiring a public rule-making as part of the EPA approval process, all interested parties, including the public, will now have another opportunity for input into the Test Phase and retrieval planning process. DOE is optimistic that this open process will enhance public trust and confidence in the Test Phase activities.

- EPA Determination of Compliance with No Migration Determination. EPA must determine WIPP's compliance with terms and conditions of the No Migration Determination issued by EPA under the

Resource Conservation and Recovery Act (RCRA) regulations.

In March 1990, DOE submitted a Petition to EPA, along with documentation demonstrating no migration of hazardous constituents under RCRA. EPA issued a No Migration Determination to DOE in November 1990, which followed a formal public review process. The Act now requires that EPA make a formal determination that the terms and conditions of the No Migration Determination have been met prior to starting the Test Phase. EPA's review will be based on DOE's submission of its 1992 WIPP No Migration Determination Annual Report, the Quality Assurance Program Plan, the Waste Characterization Program Plan, and additional documentation and audits as needed by EPA.

- DOE Issuance of and MSHA Concurrence on Room Stability Plan. DOE must issue a plan to ensure stability in the underground test rooms, and the Mine Safety and Health Administration (MSHA) must concur in the adequacy of DOE's plan. The Bureau of Mines (BOM) is to conduct annual safety evaluations of WIPP.

DOE's Room Stability Plan, which is to be submitted to MSHA for review in early 1993, consists of a summary plan plus other relevant documentation regarding stability of the underground. Documentation includes reports completed in 1991 by two independent panels of geotechnical experts; the Room 1, Panel 1, support system final design and geotechnical monitoring reports; and a statement by the State Mine Inspector attesting that from a safety standpoint, WIPP is the best underground mine in the State of New Mexico and that the engineered support added to Room 1, Panel 1, will assure stable openings "at least a decade." In addition to MSHA's review of the documentation submitted by DOE on underground stability, MSHA also plans to conduct on-site visits. MSHA has indicated that it will work closely with BOM, who will be performing annual safety evaluations.

- OSHA Certification of Accident Prevention and Emergency Response Training. Prior to Test Phase shipments, the Occupational Safety and Health Administration (OSHA) must certify DOE's accident prevention and emergency response training for compliance with OSHA regulations at 29 CFR 1910.120. This certification will be based on submission of documentation by DOE on its training course materials, random visits by OSHA representatives to ongoing training classes, and observance of WIPP emergency response exercises.
- DOE Certification of the Safety of Test Phase Activities. DOE must certify, through issuance of safety analysis documentation, that the safety of Test Phase activities can be ensured through procedures that would not compromise the type, quantity, and quality of data collected.

A Final Safety Analysis Report (FSAR) was issued in May 1990 for the WIPP facility. An FSAR Addendum for Dry Bin-Scale Tests was issued in September

1991. DOE is now finalizing a modification of this Addendum to address humid bin tests. Additional FSAR addenda for subsequent waste tests are also under development. This approach is consistent with DOE's phased approach to waste testing. No waste tests will be conducted until FSAR documentation is in place and DOE has certified the safety of the tests.

#### **DISPOSAL PHASE PREREQUISITES SET FORTH BY P.L. 102-579**

The Act also established a number of requirements that must be met before WIPP can be designated a disposal site. These prerequisites include the following:

- EPA must certify, through rule-making, that DOE will comply with the disposal regulations under 40 CFR 191, Subpart B.
- DOE must notify Congress of compliance with all applicable environmental laws and regulations.
- DOE must submit to Congress recommendations for the disposal of all transuranic waste under DOE control, including a timetable for disposal of such waste.
- DOE must submit to EPA a survey identifying all transuranic waste types at all sites from which wastes are to be shipped to WIPP.
- DOE must submit to Congress decommissioning and post-decommissioning plans.

- DOE must acquire two existing oil and gas leases, unless EPA determines such acquisition is not required.

#### **OTHER LEGISLATIVE REQUIREMENTS**

The Act contains numerous other requirements that must be met during the Test Phase, Disposal Phase, and Decommissioning Phase. These include periodic safety inspections by BOM and MSHA, biennial DOE publication of performance assessment reports, review of emergency response training by the National Institute of Occupational Safety and Health (NIOSH), periodic documentation issued by DOE demonstrating continued environmental compliance, and various consultations with Federal agencies and review groups.

#### **CONCLUSION**

Implementation of Public Law 102-579 is a top priority for DOE. DOE is working diligently with all involved agencies to assure that necessary approvals and certifications are in place prior to the first Test Phase shipments. As of this writing, the earliest that the Test Phase with waste can begin, assuming all the above Test Phase prerequisites are met, is August 1993.

While DOE has obtained independent reviews by EPA and other agencies and review groups throughout its preparation for Test Phase readiness, DOE views the Act's new regulatory framework as a positive step toward enhanced public trust and confidence in the WIPP program.