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ENVIRONMENTAL EVALUATION GROUP

P.O. BOX 968

SANTA FE, NEW MEXICO 87504

(505) 827-0556

U. S. SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES

HEARINGS ON WIPP LAND WITHDRAWAL BILL S1272

Revised

Testimony

by

Robert H. Neill

Environmental Evaluation Group
Environmental Improvement Division
Health and Environment Department

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Mr. Chairman:

Thank you for the opportunity to appear here regarding EEG's technical evaluation of the WIPP Project. Dr. James K. Channell, Environmental Engineer and Dr. Lokesh Chaturvedi, Engineering Geologist are also here to help respond to any questions.

Background

The Environmental Evaluation Group was created in 1978 to conduct an independent technical evaluation of the potential radiation exposure to people from the proposed Waste Isolation Pilot Plant (WIPP) Project in southeastern New Mexico, in order to protect the public health and safety and ensure that there is minimal environmental degradation. The EEG is part of the Environmental Improvement Division, a component of the New Mexico Health and Environment Department -- the agency charged with the primary responsibility for protecting the health of the citizens of New Mexico.

The Group is neither a proponent nor an opponent of WIPP.

Staff includes a geologist, hydrologist, environmental engineer, two health physicists, quality assurance engineer, radiological monitoring expert technician, scientific liaison officer, librarian, administrative officer, and three secretaries. Our office at the WIPP Site has five staff members.

The full-time multi-disciplinary review is funded entirely by the U. S. Department of Energy through Contract DE-AC04-79AL10752 with the New Mexico Health and Environment Department.

Amounts of Radioactive Waste

WIPP is intended to eventually be a repository for permanent disposal of contact handled (CH-TRU) and remote handled (RH-TRU) transuranic waste generated from the nation's defense programs. Transuranic (greater than uranium in atomic weight) wastes contain more than 100 n Ci/g of wastes.

The waste is not fused in an insoluble glass matrix and can contain respirable sized particles up to 1% by weight. Waste is stored in conventional DOT type 17-C 55 gallon carbon steel drums or in steel boxes with a design life of 20 years. WIPP is also scheduled to contain a limited amount of Defense high Level Waste (DHLW) which will be used for experimental purposes and retrieved prior to closure of the facility. The quantities of radioactivity and volumes of each waste type are shown below.

Inventory of WIPP

| Waste Type | Radioactivity (Curies) | Volume (Cubic Feet) | Maximum External Dose Rate (R/Hour) |
|------------|---------------------------|------------------------|--|
| CH-TRU | 14,100,000 | 5,500,000 | 0.2 |
| RH-TRU | 5,100,000 | 150,000 | 1,000 |
| HLW | 17,000,000 | 1,000 | 30,000 |

(Reference: Integrated Data Base, 1987)

Although there is a tendency to describe TRU waste as "Low-level Waste (LLW)", the transuranic waste to be emplaced at WIPP is not low level waste. LLW can be disposed with shallow land disposal technology at a cost of \$15 per cubic foot. If WIPP were LLW, the 6 million cubic feet could be disposed at a cost of \$100 million and not the \$2.1 billion being spent on WIPP. Needless to say, one would not unnecessarily spend an additional \$2 billion to place the wastes at a depth of 2,150 feet if this were LLW. Additionally, the U. S. Environmental Protection Agency Standards for the disposal of High Level Waste apply equally to TRU waste. In their judgement, the hazards, while different, require comparable geological isolation to protect the public health and safety.

Method of Operation

Analyses are conducted of available data concerning the proposed site, the design, operations, and long-term stability of the repository and the transportation of wastes. These analyses include independent

investigations as well as assessments of reports issued by the U. S. Department of Energy (DOE) and its contractors, and other Federal agencies and organizations as they relate to the potential health, safety and environmental impacts from WIPP.

Thirty-five major reports have been issued to date and distributed to 450 different recipients including the Governor and his policy advisors, the Congress, the Legislature, the scientific community, the Department of Energy, its contractors, and the general public.

From the beginning we believed it to be necessary to publish our analyses and reports and to subject our work to scientific peer review in order to maintain scientific credibility and to insure the broadest possible dissemination of our findings. The breakdown of 35 reports is as follows:

SUBJECT OF REPORTS

| | |
|--------------------------------|----|
| Site Characterization | 16 |
| Performance Assessment | 7 |
| Transportation | 3 |
| Review of Regulatory Documents | 7 |
| Environmental Monitoring | 2 |

The EEG approach to assessing the public health and safety consequences of WIPP has not been limited to a critique and review of published DOE positions. EEG has established an independent position on every major radiological health issue. These reports are listed at the end of the testimony and copies are available.

EEG REPORTS (1979-87)

| | |
|-----------------------|----|
| Review of DOE Reports | 6 |
| Original Work | 29 |

Unlike Congressional legislation requiring NRC licensing for the disposal of defense wastes in the form of defense uranium mill tailings and defense high level wastes, Congress excluded NRC licensing of WIPP in the 1979

Authorization Act (PL 96-164). This places a very heavy burden on EEG to insure the States' health and safety concerns are fully met while operating under the non-regulatory provisions of the 1978 Contract and the 1981 Consultation and Cooperation Agreement between New Mexico and the U. S. Department of Energy.

Accomplishments

What are some of the accomplishments of the EEG efforts?

1. Relocation of the repository. After a brine reservoir estimated to be 5 to 17 million barrels was intercepted at a point 460 feet north and 600 feet below the planned location of radioactive waste, EEG recommended the relocation of the repository 1-1/4 miles to the south to a zone that was structurally less complex. Eight months later, DOE concurred.
2. DOE agreed to conduct additional tests to flow a brine reservoir, delineate the extent of brine under the repository through geophysical techniques and to measure the flow and transport characteristics of the aquifer most likely to be involved in a breach scenario.
3. After EEG notified DOE in August 1985 that the design of the TRUPACT-I shipping container to be used to transport transuranic wastes to WIPP was unacceptable for use in New Mexico, DOE agreed in May 1986 to redesign the shipping container to incorporate U. S. Nuclear Regulatory Commission (NRC) requirements of double containment for shipments exceeding 20 Ci Plutonium and to eliminate venting. Subsequently, DOE has agreed to have all shipping containers used to bring waste to WIPP certified by the Nuclear Regulatory Commission.
4. EEG sponsored 5 major meetings providing a forum for differing views on the adequacy of the geology to prevent the waste from returning to the biosphere and to quantify the radiation doses from different breach and leach scenarios. While these sessions did not achieve a technical consensus, they did approach agreement on the information needed to be able to predict long-term future behavior based on reconstruction of the past

history. Credit for these very successful sessions is also shared with DOE and Sandia, the U. S. Geological Survey, the National Academy of Sciences and universities of New Mexico and other universities. It is essential that technical concerns be aired through structured scientific debate, not only to try and resolve their future significance but to provide assurance to policy makers and the public that these issues are being openly and adequately addressed.

5. Continuing technical interactions with DOE to insure a good system. An example is the work this past year by EEG on the ability of the DOE monitoring system in the exhaust air duct from the mine to detect radioactivity during operations and divert the air flow to pass through high efficiency filters before discharge to the environment.

Work to be Done

There is still a considerable amount of work to be performed by EEG on WIPP.

1. An evaluation of the WIPP's conformance with the September 1985 EPA Standards (40 CFR 191) governing the disposal of both transuranic and high level waste. The standards were vacated by the First Circuit Court of Appeals in Boston on July 17, 1987 and remanded to the agency for reconsideration. The basis for the decision was that parts of the Rule did not contain adequate justification, the rule-making procedures were flawed, and they were not as restrictive as Congress intended in the Safe Drinking Water Act. EPA has not yet announced their plans for re-promulgation. EEG testified at public hearings, the EPA Scientific Advisory Board meetings and provided written comments on the proposed standards in the past, and we anticipate working with EPA on this in the future as well.

Pending promulgation by EPA of new standards, we will continue to measure the performance of the repository against the old standards as agreed to by New Mexico and DOE in the recent Modification to the Consultation and Cooperation Agreement.

The Department of Energy does not expect to complete their determination of whether WIPP will meet the standard for safe disposal until 1992.

2. Monitoring for radioactivity both on-site and off-site. Under terms of the Stipulated Agreement to the 1981 lawsuit of the New Mexico Attorney General, the Department of Energy has provided funding for our pre-operational monitoring program for background radioactivity at both the WIPP site and in the surrounding communities. The NM Attorney General is currently negotiating with the Department of Energy for an independent isokinetic stack monitoring system for radioactivity in exhaust air at the point of discharge to the environment to be operated by EEG. The purpose of this independent monitoring is to document the presence and or the absence of any radioactivity being released and thereby validate the results of DOE as provided by the C & C Agreement.

3. Overview of the plans and procedures to minimize occupational radiation exposure to workers at the WIPP Site.

Specific Activities During The Next Year:

1. Evaluation of the design of the new Type B TRUPACT shipping container to be used for the transportation of Contact Handled Transuranic waste.

2. Evaluation of the RH-TRU shipping cask.

3. Completion of the EEG preoperational monitoring program at the site and in the surrounding communities.

4. Design and install the EEG monitoring system in the exhaust stack.

5. Complete our evaluation of DOE's on-site continuous air monitoring systems.

6. Evaluation of the air underground ventilation system for both normal and accidental conditions for the new air intake shaft scheduled for completion in October 1988.

7. Complete our evaluation of WIPP's compliance with Part A of the EPA Standard relating to management and storage (Part A, 40CFR191) and evaluate DOE's determination of compliance.
8. Evaluate the DOE plans for CH-TRU and RH-TRU experiments at WIPP when published.
9. Evaluate DOE's estimated schedule and description of the process that will be used to show compliance with the Assurance Requirement of Part B of the EPA Standard.
10. Integrate information from ongoing studies to determine high probability breach scenarios and their assessment in view of the Containment Requirement of Part B of the EPA Standard.
11. Provide technical assistance to other state agencies in areas such as response training.
12. Integrate information from ongoing hydrologic studies with existing data to form a reliable model of WIPP area hydrology. Evaluate ongoing geochemical work to determine the radionuclide transport properties for WIPP release scenarios.

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Reports**

- EEG-1 Goad, Donna, A Compilation of Site Selection Criteria Considerations and Concerns Appearing in the Literature on the Deep Disposal of Radioactive Wastes, June 1979.
- EEG-2 Review Comments on Geological Characterization Report, Waste Isolation Pilot Plant (WIPP) Site, Southeastern New Mexico SAND 78-1596, Volumes I and II, December 1978.
- EEG-3 Neill, Robert H., et al, (eds.) Radiological Health Review of the Draft Environmental Impact Statement (DOE/EIS-0026-D) Waste Isolation Pilot Plant, U. S. Department of Energy, August 1979.
- EEG-4 Little, Marshall S., Review Comments on the Report of the Steering Committee on Waste Acceptance Criteria for the Waste Isolation Pilot Plant, February 1980.
- EEG-5 Channell, James K., Calculated Radiation Doses From Deposition of Material Released in Hypothetical Transportation Accidents Involving WIPP-Related Radioactive Wastes, November 1980.
- EEG-6 Geotechnical Considerations for Radiological Hazard Assessment of WIPP. A Report of a Meeting Held on January 17-18, 1980, April 1980.
- EEG-7 Chaturvedi, Lokesh, WIPP Site and Vicinity Geological Field Trip. A Report of a Field Trip to the Proposed Waste Isolation Pilot Plant Project in Southeastern New Mexico, June 16 to 18, 1980, November 1980.
- EEG-8 Wofsy, Carla, The Significance of Certain Rustler Aquifer Parameters for Predicting Long-Term Radiation Doses from WIPP, September 1980.
- EEG-9 Spiegler, Peter, An Approach to Calculating Upper Bounds on Maximum Individual Doses From the Use of Contaminated Well Water Following a WIPP Repository Breach, September 1981.
- EEG-10 Radiological Health Review of the Final Environmental Impact Statement (DOE/EIS-0026) Waste Isolation Pilot Plant, U. S. Department of Energy, January 1981.

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- EEG-11 Channell, James K., Calculated Radiation Doses From Radionuclides Brought to the Surface if Future Drilling Intercepts the WIPP Repository and Pressurized Brine, January 1982.
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- EEG-13 Spiegler, Peter., Analysis of the Potential Formation of a Breccia Chimney beneath the WIPP Repository, May, 1982.
- EEG-14 Not published.
- EEG-15 Bard, Stephen T., Estimated Radiation Doses Resulting if an Exploratory Borehole Penetrates a Pressurized Brine Reservoir Assumed to Exist Below the WIPP Repository Horizon, March 1982.
- EEG-16 Radionuclide Release, Transport and Consequence Modeling for WIPP. A Report of a Workshop Held on September 16-17, 1981, February 1982.
- EEG-17 Spiegler, Peter, Hydrologic Analyses of Two Brine Encounters in the Vicinity of the Waste Isolation Pilot Plant (WIPP) Site, December 1982.
- EEG-18 Spiegler, Peter, Origin of the Brines Near WIPP from the Drill Holes ERDA-6 and WIPP-12 Based on Stable Isotope Concentrations of Hydrogen and Oxygen, March 1983.
- EEG-19 Channell, James K., Review Comments on Environmental Analysis Cost Reduction Proposals (WIPP/DOE-136) July 1982, November 1982.
- EEG-20 Baca, Thomas E., An Evaluation of the Non-radiological Environmental Problems Relating to the WIPP, February 1983.
- EEG-21 Faith, Stuart, et al., The Geochemistry of Two Pressurized Brines From the Castile Formation in the Vicinity of the Waste Isolation Pilot Plant (WIPP) Site, April 1983.
- EEG-22 EEG Review Comments on the Geotechnical Reports Provided by DOE to EEG Under the Stipulated Agreement Through March 1, 1983, April 1983.

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- EEG-23 Neill, Robert H., et al., Evaluation of the Suitability of the WIPP Site, May 1983.
- EEG-24 Neill, Robert H. and James K. Channell Potential Problems From Shipment of High-Curie Content Contact-Handled Transuranic (CH-TRU) Waste to WIPP, August 1983.
- EEG-25 Chaturvedi, Lokesh, Occurrence of Gases in the Salado Formation, March 1984.
- EEG-26 Spiegler, Peter, Environmental Evaluation Group's Environmental Monitoring Program for WIPP, October 1984.
- EEG-27 Rehfeldt, Kenneth, Sensitivity Analysis of Solute Transport in Fractures and Determination of Anisotropy Within the Culebra Dolomite, September 1984.
- EEG-28 Knowles, H. B., Radiation Shielding in the Hot Cell Facility at the Waste Isolation Pilot Plant: A Review, November 1984.
- EEG-29 Little, Marshall S., Evaluation of the Safety Analysis Report for the Waste Isolation Pilot Plant Project, May 1985.
- EEG-30 Dougherty, Frank, Tenera Corporation, Evaluation of the Waste Isolation Pilot Plant Classification of Systems, Structures, and Components, July 1985.
- EEG-31 Ramey, Dan, Chemistry of the Rustler Fluids, July 1985.
- EEG-32 Chaturvedi, Lokesh and James K. Channell, The Rustler Formation as a Transport Medium for Contaminated Groundwater, December 1985.
- EEG-33 Channell, James K., John C. Rodgers and Robert H. Neill, Adequacy of TRUPACT-I Design for Transporting Contact-Handled Transuranic Wastes to WIPP, June 1986.
- EEG-34 Chaturvedi, Lokesh, (edi), The Rustler Formation at the WIPP Site, January 1987.
- EEG-35 Chapman, Jenny B., Stable Isotopes in Southeastern New Mexico Groundwater: Implications for Dating Recharge in the WIPP Area, October 1986.
- EEG-36 Lowenstein, Tim K., Post Burial Alteration of the Permian Rustler Formation Evaporites, WIPP Site, New Mexico, April 1987.