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ENVIRONMENTAL EVALUATION GROUP
320 E. MARCY STREET
P.O. BOX 968
SANTA FE, NEW MEXICO 87503
(505) 827-8280



ENTERED

WIPP: Lessons Learned for State/DOE
Consultation and Cooperation

by

Robert H. Neill

The High Level Waste Business -
Transportation, Storage and Disposal

ATOMIC INDUSTRIAL FORUM

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Organization of EEG

The Environmental Evaluation Group (EEG) was established by mutual agreement between the State of New Mexico and the U.S. Dept. of Energy in 1978 to conduct an independent technical review of the health and safety impact and potential environmental degradation of the WIPP Project. It is a full-time, multidisciplinary group administratively located in the Environmental Improvement Division of the NM Health and Environment Department which is the agency with the primary responsibility to protect the health and safety of the citizens of New Mexico. Staff includes a geologist, hydrologist, environmental engineer, health physicist, quality assurance engineer, radiological monitoring expert, scientific liaison officer, librarian, administrative officer and two secretaries. The operation has been funded 100% by the DOE.

Output

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 both maintain scientific credibility and to insure viability thru visibility. The breakdown of 33 reports is as follows:

SUBJECT OF REPORTS

Site Characterization	14
Breach Scenario Modeling	7
Transportation	3
Review of Regulatory Documents	7
Environmental Monitoring	2

While it was expected that most of our work would entail the evaluation of DOE published material, the following shows that it has been just the reverse with an emphasis on original EEG identified issues. A list of these reports is contained at the end of the paper and copies are available.

EEG REPORTS (1979-86)

Review of DOE Reports	6
Original Work	27

What is WIPP?

WIPP is intended to be a repository for permanent disposal of 6,200,000 cu ft of transuranic waste generated from the nation's defense programs. The waste is not fixed, up to 1% can be respirable and it is stored in conventional 17-C Type A Carbon steel drums with a design life of 20 years. (Storage began in 1970). The waste form is not fused in an insoluble glass matrix and there is no commitment by DOE for getters.

UP to 12,500 cu ft of the RH-TRU can have a maximum surface dose rate of 1000 r/h. Note that WIPP is also a temporary facility for DHLW.

RADIOACTIVE INVENTORY OF WIPP

	Radioactivity (Curies)	Emplacement	Volume (Cubic Ft.)	Maximum Surface Dose Rate (R/Hour)
CH-TRU	2,800,000	Permanent	6,200,000	0.2
RH-TRU	5,100,000	Permanent	250,000	1,000
HLW	17,000,000	Temporary	150	30,000

About 0.6 Billion \$ have been spent thru FY86 on this 2.1 Billion \$ project.

The following shows the change of radioactivity as a function of time. Note how ²³⁹Pu becomes the dominant survivor before 1,000 years.

RADIOACTIVITY IN WIPP

Time (Years)	Amount of Radioactivity (Curies)	% Pu-239	Other Radionuclides
0	7,900,000	7%	Pu-241 and Sr-90, CS-137
1,000	540,000	79%	Pu-240 Am-241
10,000	350,000	91%	Pu-240
100,000	24,000	99%	
200,000	1,300	99%	
300,000	120	60%	U-235
500,000	50	.5%	U-235

How does WIPP differ from the proposed HLW repository?

1. Elimination of NRC licensing. Congress excluded NRC licensing of WIPP in the 1979 Authorization Act (PL 96-164).

DEFENSE WASTES

	<u>NRC LICENSING</u>
URANIUM MILL TAILINGS	YES
TRU	NO
HIGH LEVEL WASTES	YES

I have never been able to explain satisfactorily the apparent inconsistency of Congress on requiring NRC licensing in the 3 different types of radioactive defense wastes. In effect, WIPP is akin to an AEC project in which the same agency has the responsibility to proceed with the development of the repository and to also determine its degree of safety. This places a very heavy burden on EEG to insure that the States' health and safety concerns are fully met.

2. No veto power. While congress provided this power to the Governor and Legislature for States under the NWPA, it was denied New Mexico. The original commitment of veto power to New Mexico eroded to consultation and concurrence and subsequently to consultation and cooperation.

Accomplishments

What are some of the accomplishments of the EEG efforts?

1. Relocation of the repository. After a 15 to 25 million barrel brine reservoir 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, did not have anticlines, or an observed brine reservoir. 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. Unfortunately the work has proceeded very slowly.

3. DOE agreed to redesign the shipping container (TRUPACT), to be used for the 24,000 CH-TRU shipments to incorporate NRC requirements of double containment for shipments exceeding 20 Ci Plutonium and to eliminate venting - also required by DOT and NRC. (The average shipment will contain 120 Ci Pu.)

4. EEG sponsored 5 major meetings providing a forum for dissenting 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. After attending a two-day session on the adequacy of the site characterization of WIPP, the Deputy Attorney General of NM told me "I didn't understand any of it, but I am convinced that the process of scientific debate has been completely open and nothing is being hidden under the table".

PROBLEM AREAS

While many of the experiences have been productive, the following illustrates some examples of areas that have not been resolved.

Compliance with EPA Standard

EPA issued standards for the disposal of TRU and HLW in August 1985. Fourteen months later, The Albuquerque Operations Office, (ALO), DOE has still not issued a schedule or plan to demonstrate compliance with the standard. DOE has informally indicated that compliance will not be completed until 1991 or 1992 which will be several years after waste emplacement begins in October 1988. Their rationale is that WIPP will be only a research and development facility for 5 years until a decision is made to retrieve. At that time it would become a repository and, only then, be subject to the Part B disposal provisions of 40 CFR 191. The only experiment for TRU Waste at WIPP will be emplacement of 800 drums each week which will amount to 200,000 drums and boxes in 5 years. By contrast, NRC is implementing the EPA standards to require the demonstration of conformance by DOE prior to issuing a license to begin construction.

The emplacement of over 20% of the waste with no experiments, and no intent to retrieve is not R&D but is disposal. Additionally, DOE has been working for over a year on permanent land withdrawal legislation for WIPP - hardly a necessary requirement for an R&D facility.

Land Withdrawal Legislation

The State has been unable to obtain the DOE/DOI proposed legislation which is now slated to be introduced in Congress after the first of the year. We understand that it does not contain a provision to

require DOE to dispose of the 1.2 million tons of salt left over on the surface at the conclusion of the project. (DOE has only agreed to study what to do with the residue), nor does it require the Dept. to ban the mining after decommissioning of potash located 500 above the waste horizon. (Again, ALO DOE has only agreed to reexamine the temporary mining ban one year before decommissioning in 2013.)

The EPA assurance requirements, [191.14(e)] however, require DOE to avoid sites where there is a reasonable expectation of exploration of scarce minerals, unless there are compensating favorable characteristics. Such documentation has not been published by DOE. NM only has assurances to ban mining until 2013. By contrast we note that the NWPA side of DOE has flatly committed to a ban on mining at the HLW repository site.

Although DOE is requesting the Congress to give them control of this land in perpetuity, they have said that it is premature for the Dept. to publish their plans for the management of that land including the length of time to maintain guards, fences, prevention of mineral exploration, markers, etc.

Consultation and cooperation evidently does not include sharing a copy with NM of a proposal to Congress to take permanent title to 16 square miles of NM land.

TRUPACT Design

Although DOE stated in the 1980 WIPP FEIS that the shipping containers would meet the regulation of the U.S. DOT and NRC, the 1978 TRUPACT design with single containment and venting has been in violation of DOT, NRC and DOE regulations. EEG informed DOE in Aug. 1985 that these deficiencies made the TRUPACT unacceptable for use in New Mexico. We listed a number of potential solutions to the dilemma

including the option of asking NRC for an exemption to the double containment requirement.

In May 1986, ALO announced that they were redesigning the TRUPACT to include double containment and the elimination of venting. Subsequently DOE funded a committee of the American National Standards Institute to determine whether new standards should be written to permit waste shipments containing more than 20 Ci plutonium to have single containment and permit venting. ALO has also submitted a request to the Office of the Ass't. Secretary of Defense Programs to certify the single containment TRUPACT I design for WIPP despite its failure to meet DOE's own regulations. We published our analyses in September (EEG-33) on the adequacy of the TRUPACT I design. DOE has not yet published their justification for their 1978 design which fails to meet a 1974 AEC regulation! DOE has not asked NRC for an exemption or variance for their design - possibly because NRC rejected DOE's request to exempt waste in 1979.

OCRWM is to be praised for their commitment to ship the defense high level wastes in an NRC certified cask. Unfortunately, we have not been able to secure a similar commitment to ship the DHLW to WIPP in an NRC certified cask nor the cask for the 250,000 cu ft of RH-TRU waste. The DHLW canisters for WIPP will contain 0.42 million curies and may have a maximum external gamma dose rate of 30,000 rh/h. Some bare waste experiments may contain 20,000 curies of fission products.

High level waste experiments

The question arises of the need and desirability to perform experiments with high level wastes at WIPP. The original purpose in the Oct 1980 WIPP FEIS stated "...the experiments are not so much concerned with the WIPP itself, as they are with planning future high level waste repositories. They are to answer technical questions

about the disposal of high level waste in bedded salt and to provide a valid demonstration of the concepts involved." The purpose now is to provide information for RH-TRU disposal and to generate scientific knowledge that may be helpful to others and not to demonstrate high level waste disposal.

There are other valid reasons to question the work.

1. The Secretary reassigned the responsibility to demonstrate the safe disposal of defense HLW to OCRWM.
2. OCRWM is not planning similar in-situ HLW testing in either basalt or volcanic tuff in order to predict the behavior of HLW in those media.
3. NRC does not require such tests as a licensing requirement in 10 CFR 60 for a HLW repository.
4. It does not appear that the Savannah River Plant (SRP) can produce the desired thermal and radiological characteristics for the experiments.
5. The potential beneficiaries are OCRWM, NRC and the State of Texas. None have participated in the design of the experiments.
6. The rapid rate of plastic deformation of salt at WIPP suggests that the retrieval of these wastes may be more complicated than originally thought.

Definition of C&C

At one time the Governor of NM expressed his concern that DOE had been less than candid in informing us of their work on the transportation

problem associated with the generation of hydrogen gas thru radiolysis of waste, and requested the DOE Inspector General to investigate the matter. The IG replied that he had examined the 1981 C&C Agreement and noted that the several reports identified in the Agreement to be provided to the State had been provided to us. Therefore, the IG concluded the legal commitment to consult and cooperate with the State had been fulfilled. This means that consultation and cooperation must be clearly defined by states and the DOE. And cooperation, like pornography, is very difficult to define but most people can recognize it when they see it.

States clearly have responsibilities and authority under the NWPA and an independent multidisciplinary scientific review and evaluation is one of the most important tasks since a State's interests are not necessarily served by the various federal agencies involved in the disposal of spent fuel, high level and transuranic waste.

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- KEG-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.
- KEG-5** Channell, James K. Calculated Radiation Doses From Deposition of Material Released in Hypothetical Transportation Accidents Involving WIPP-Related Radioactive Wastes, November 1980.
- KEG-6** Geotechnical Considerations for Radiological Hazard Assessment of WIPP. A Report of a Meeting Held on January 17-18, 1980, April 1980.
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- 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.
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