



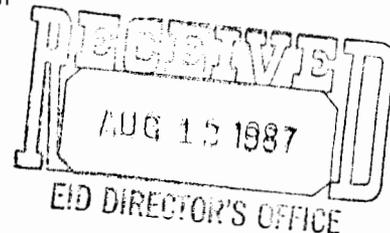
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STATE OF NEW MEXICO

ENVIRONMENTAL EVALUATION GROUP

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file

MEMORANDUM

TO: Mr. Hal Stratton
Attorney General

THRU: Dr. Tom Bahr, Chairman
Radioactive Waste Task Force

FROM: Robert H. Neill, Director
Environmental Evaluation Group

DATE: August 11, 1987

Robert H. Neill

In accordance with the August 6, 1987 telephoned request by Ms. Alicia Mason of your office, EEG has prepared the following materials for your consideration in negotiations with the Department of Energy on changes to the Consultation and Cooperation Agreement via Modifications, Stipulated Waivers or other mechanisms. EEG would like to brief you on these recommendations at your convenience.

1) DOE's request to delete their 1984 Commitment in the C & C Agreement to perform sorbing tracer tests.

In exchange, we recommend the State obtain a ~~commitment~~:

- a. to perform various tests and studies described in Attachment A
- b. to take no credit for retardation of radionuclides during transport by groundwater in the Subpart B Containment calculations of 40CFR191 unless the validity of taking such credit is clearly demonstrated to the satisfaction of EEG on the basis of field or laboratory experiments, and
- c. to provide for independent EEG monitoring of radioactivity in mine air discharged to the environment. Attachment B contains our rationale for this commitment.

When DOE requested comments on the scientific merit of deleting the sorbing tracer tests from the NAS WIPP Panel meeting in Washington in June, I suggested that a meeting be held with scientists from EEG, Sandia and the NAS before EEG would recommend action to the Attorney General. On August 10th DOE finally agreed to hold the meeting on September 4th.

The above material is consistent with my July 24th letter to you except for a revision in the list of requested tests (Attachment C).



Additional items include the following:

Volume of waste to be emplaced during demonstration period

In regard to the provision of allowing 15% of the waste to be emplaced prior to the demonstration by DOE of compliance with Subpart B of the EPA Standards, there have been some new developments of which you may not be aware. During a meeting with DOE on July 23, 1987, we were informed that due to uncertainty in the final choice of backfill and concerns about retrieval, DOE will not emplace backfill on any waste emplaced during the first five years. Because of the difficulties of emplacing backfill around the waste after five years, it would be necessary to relocate and restack the drums in freshly excavated rooms for emplacement of backfill. They expressed an intent to emplace waste to the 15% limit in order to demonstrate the transition from filling one panel to another, a procedure we consider fairly simple and not necessary to demonstrate. This could result in unnecessary radiation risk and increased cost as workers may have to relocate 127,000 drums. If the drums are not moved, it could result in 15% of the waste being emplaced in a substandard fashion without adequate backfill. We believe that given the possible risks to the workers and/or the citizens of New Mexico, DOE should limit the quantity of waste emplaced to that needed for experimental purposes.

A deadline for demonstrating compliance with the Subpart B Containment requirements is also needed in addition to the volume constraint.

Timing of Completion of EPA Subpart B Assurance Requirements (40CFR191)

On May 22, 1987 EPA informed DOE that the Subpart B Assurance requirements should be completed prior to October 1988 (Attachment D). In the same letter, EPA indicated that DOE had concurred with this requirement at a March 26, 1987 meeting. Though the absence of a written objection cannot be construed as approval, DOE has yet to take exception to the EPA assertion of an October 1988 compliance deadline. Compliance before waste arrives was also specified in your April 17, 1987 draft proposal. Modification #2 does not require the work to be completed prior to the emplacement of 15% of the waste.

Compliance with EPA Standard Without Waivers

We also suggest adding at the end of E.1 on page 4, the statement "DOE agrees not to seek compliance with the EPA Standards through grandfathering, variances, waivers, or exemptions." This is especially important now that 40CFR191 has been vacated and it is possible that new standards may not be in place by the time waste arrives at WIPP.

Plans for DHLW Experiments

DOE should publish benefit-risk and cost-benefit analyses for the DHLW experiments. The purpose of these experiments has remained nebulous, and their performance may expose the public and workers to needless risk.

Disposal of Residual Salt Tailings

The purpose of requesting a commitment from DOE to remove the 1.5 million tons of salt tailings in the decommissioning phase was to preclude DOE from making a determination that their presence would be environmentally acceptable and left in place. That option has not been eliminated in Modification #2.

I hope these comments will be of use to you. EEG is at your disposal if you wish to discuss them as well as other items as they develop.

RHN:cs

Enclosures

cc: Tom Bahr, Secretary, Health and Environment Department
✓Mike Burkhart, Director, Environmental Improvement Division

August 11, 1987

ATTACHMENT A

EEG PROPOSED GEOTECHNICAL STUDIES IN LIEU OF THE SORBING TRACER TEST

Geotechnical Studies in lieu of the Sorbing Tracer Test

Purpose: The purpose of these studies will be to gather reliable information for use in the Performance Assessment for showing compliance of WIPP with the EPA Standards contained in CFR 40 Part 191. The following are the specific objectives of these studies.

- A. Completion of regional characterization of the water-bearing zones in the Rustler Formation.
- B. Laboratory Studies related to sorption.
- C. Completion of investigations for the presence of a pressurized brine reservoir under the repository and evaluation of its consequences.
- D. Characterization of the quantity, distribution and mechanics of fluids in the Salado Formation.
- E. Improving understanding of the hydrologic interaction of the Rustler water-bearing zones with WIPP shafts and seals.

The following are the specific studies which will be performed to accomplish each of these objectives. Target date for completion of each study should be first proposed by DOE and should be acceptable to the State. Each test or study will result in a report containing the analyses and results of the study. These proposed studies will replace the Sorbing Tracer Test only and do not in any way release DOE from other commitments made as part of the first C & C Modification of 1984.

A. Hydrologic characterization of the Rustler Formation

- 1. Multi-well flow test to confirm and locate the postulated high transmissivity zone in Culebra aquifer in the SE part of WIPP site. Site for an additional well will be located on the basis of the preliminary hydrologic model and electromagnetic surveys and will be drilled for use in this test.

2. A conservative tracer experiment at the H-11 hydropad. This test will necessitate drilling of a fourth hole at sufficient distance from the H-11 pad to examine whether or not dual-porosity effects indeed decrease in importance with increasing transport distance.

3. Multi-well flow test in the southwestern part of the WIPP site to investigate the postulated low transmissivity zone in the region between the wells H-3 and H-4.

4. Radiocarbon dating to identify the recharge and flow patterns in the Culebra aquifer. Sample existing wells both at the WIPP site and at greater distances from WIPP within the water-balance study area (defined in SAND84-2233; Hunter, 1985) for carbon-14 analyses. The sampled wells should include, but are not limited to, the Culebra at H3, DOE 1, H11, W-30, W-13, H14, H15; the Magenta at H6, H5, and H3; Rustler, Dewey Lake, or Dockum Group wells as available in the Clayton Basin area, Mimosa Ridge, between the site and San Simon Swale, and southern areas between the site and Malaga. Exception can be made for any wells that are known to contain organic agents which were added to prevent circulation losses. Data should also be collected on the metabolic pathway characteristics (and thus $\delta^{13}\text{C}$) of present vegetation and the $\delta^{13}\text{C}$ of modern soil-gas and soil-carbonates. These data should be evaluated using quantitative geochemical modeling.

5. Investigation of the areas and mechanisms of recharge to the water-bearing units in the Rustler. This study will consist of several parts including: an investigation to confirm or deny the presence of a groundwater divide between Clayton Basin and Nash Draw; a study of water levels in units above the Salado in Ts.21 to 23S. R.32E to establish hydrologic conditions east of the site and confirm or deny a groundwater divide between San Simon Swale and the site; and a study of infiltration in areas of possible groundwater recharge

using state-of-the-art techniques to evaluate seepage in surface depressions and infiltration in the saturated and unsaturated zones. A report containing the results of these investigations and synthesizing them into an evaluation of recharge to Rustler aquifer will be prepared.

6. Evaluation of areas and mechanisms of groundwater discharge from Rustler units. Discharge to the Pecos River will be evaluated with seepage runs on the Pecos between USGS gaging stations 4052 and 4075, in late winter. Evapotranspiration rates should be calculated as part of the infiltration study described under #5 as well as from data collected from a WIPP weather station for temperature, relative humidity, wind speed, evaporation from a Class A pan, and evapotranspiration using a lysimeter. A report containing the results of these investigations and an evaluation of discharge from the Rustler will be prepared.

7. A scoping study of the feasibility and usefulness of palynological, vertebrate and invertebrate paleontological and dendrochronological methods for long-term climatic modeling. This will be followed by detailed paleoclimate study using techniques determined to be both feasible and useful.

8. Geophysical surveys (mainly CSAMT) to estimate the lateral variability of the Rustler Formation. This work will be first performed in areas where more reliable interpretations of the Rustler hydrologic properties have been made and then will be extended to areas for which less information is available.

9. Development of a generalized three-dimensional regional flow model extending from the ground surface to the Bell Canyon Formation.

10. Development of transport models for the Culebra following a high-pressure (brine reservoir) breach. The objectives of this work are to estimate the significance of fracture flow in contaminant transport and to determine the most important variables in regional transport, in the event of a high-pressure breach.

B. Laboratory Studies Related to Sorption

1. Evaluation of the solute-rock interactions relevant to transport within the Culebra to estimate the effects of such variables as fluid composition, natural and introduced organics, mineral-surface reactions and sulfide content on distribution behavior of radionuclides within the Culebra dolomite.
2. Matrix diffusion experiments in intact material for representative lithologies from the Culebra dolomite.
3. Column or fracture-flow experiments on the Culebra core, using both conservative and reactive tracers and a range of organic and inorganic fluid compositions relevant to WIPP breach scenarios.

C. Pressurized Brine Reservoir Investigations

1. Completion of geophysical investigations into the extent of pressurized brine in the Castile Formation underlying the WIPP repository. Specific field tests and modeling effort will be based on the results of the investigations completed so far and will be determined in consultation with the N.M. Environmental Evaluation Group.

D. Characterization of Salado Fluids

1. Drilling of arrays of holes into the "far-field" to monitor long-term fluid pressures within the Salado Formation.
2. Drilling and monitoring of a horizontal hole from either the

north or south, into the center of the Pillar between Rooms B and A1 or between Rooms A3 and D, to determine the effect of WIPP excavations on the fluid pressure changes with time, within the "altered zone".

3. Drilling of a series of 3-hole arrays in an interior drift, to estimate permeability and storativity distribution around the facility as a function of distance and time.
4. Drilling of an array of three holes into MB139 at an extreme end of the facility. One hole would be vertical; one at approximately 45 degrees; one as nearly horizontal as practical. Permeability of MB139 will be measured in these holes.

E. Assessment of the Effect of Shafts on Rustler Hydrology

To remove uncertainties created in the interpretation of flow tests by leakage of Rustler water in the WIPP shafts, this effect will be studied by the following three tests.

1. Multi-pad flow tests centered at H-3 well will be repeated after proper grouting of the shafts is completed.
2. Hydrologic response in several wells around the fourth shaft will be monitored as the shaft is drilled.
3. The fourth shaft will be properly instrumented with piezometers and deformation meters to continuously monitor hydrologic and geomechanical parameters.

August 11, 1987

ATTACHMENT B

EEG PROPOSED STACK MONITORING AT THE WIPP SITE

INDEPENDENT STATE OF NEW MEXICO
STACK MONITORING AT THE WIPP SITE

The State of New Mexico Environmental Evaluation Group has requested of the Department of Energy WIPP Operations Office that State on-site monitoring of radionuclide emissions in underground exhaust be permitted and supported for the following reasons:

- 1) The C & C Agreement between DOE and the State clearly provides for State on-site monitoring at WIPP [C & C, Article VIII, (C) ". . . the state shall have the right to conduct reasonable independent monitoring and testing of on-site activities related to the WIPP Project. . ."]. The State has already operated a continuous ambient air sampler within the inner fence for over a year without DOE objection.

- 2) The extraction and counting of independent samples of exhaust air will provide both the State and WIPP/DOE the best possible validation of the absence of routine releases from the disposal of TRU waste underground, and therefore will unquestionably be the most valuable sample of any taken for demonstrating effective operational control.

- 3) An independent State validation program will provide the greatest confidence-building effort undertaken during operation. Should an accident occur underground, the State stack monitoring results will provide highly credible confirmatory evidence of whatever release may have occurred--or the absence of a release. No other on- or off-site sampling results will substitute for such direct data.

- 4) In addition to the precedence established by the existing State on-site ambient monitoring station, a precedent is provided in the State of Washington air quality regulations. Washington has recently promulgated air quality and emission standards for radionuclides (Chapter 402-80 WAC) which provide for applicability to DOE and NRC facilities, and for independent, State sampling ports in such facilities if needed. These standards are consistent with EPA NESHAP 40CFR Part 61 standards, and could be enforced on EPA's behalf.