



United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA. 22092

In Reply Refer To:
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May 26, 1983

WM Record File

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WM Project WM-10

Docket No. ✓

PDR ✓

LPDR ✓

Mr. O. L. Olson, Project Manager
Basalt Waste Isolation Project Office
U.S. Department of Energy
P.O. Box 550
Richland, Washington 99352

Distribution:

H J MILLER

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Dear Mr. Olson:

This is to confirm that the U.S. Geological Survey (USGS) review committee will be available for your briefing at Richland during the period June 7-10, 1983. We appreciate your staff's willingness to accommodate us during this timeframe, and we will, in turn, make every effort to minimize our disruption of ongoing activities. No one needs "just another meeting;" however, I am sure that we both agree that knowledge is the basis of an objective opinion and that this briefing will be beneficial to all. To facilitate scheduling, we would like to split the briefing into three parts, (1) a field trip to view pertinent features listed in the following paragraph, (2) a presentation to the group of geologic and hydrologic data and information as listed, and (3) some small group discussions on specific topics. The smaller, topical discussions will remain undesignated and should evolve logically from the overall presentation. Hard copy of some of the requested information will be extremely valuable to us in our analysis, and we have indicated where such information is desired.

FIELD TRIP:

It is requested that the following areas and items be included in the 1-day field trip on June 7, 1983.

1. Observe drilling and hydraulic testing, as possible.
2. Exploratory Shaft Site.
3. Site of cross section in SCR (figure 3-29) or comparable area.
4. Exposures of alternate host rocks.

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5. Surface expressions of fault zones near the proposed repository site.
6. Samples of disced core.
7. Total recovered core from pilot hole (RRL-2) and any other more-recently drilled holes in the area through the interval of potential host rocks and interflow zones.
8. Site of discharge of fluids to the river from the N-reactor trenches--(optional; if convenient).

The committee feels that observation of the heater experiments or computer and data-management facilities would serve no useful purpose at this time.

DATA AND INFORMATION:

It is our understanding that detailed hydrologic information, used for characterization and model definition, was obtained principally from nine drill holes. The following information and discussion are requested for presentation to the group:

1. Detailed drilling history of each hole, including types and amounts of drilling fluids used. These histories should contain completion and construction; penetration rates; lithologic descriptions; hole conditions; observed drilling conditions and changes; types of equipment; definition of fluid losses and gains; history and amounts of additions of bentonite, polymers, etc.; and methods used to measure and/or calculate fluid losses and gains. There is also a need to know those intervals within which there was no fluid loss or gain. Hard copies of the above information are requested.
2. Detailed log for each hole defining the type(s) or tracer used in the drilling fluids and how much was recovered. Also needed is an explanation of how it was determined that all tracer had been recovered.
3. Water-level responses prior to and during hydraulic testing of each interval in each hole; equilibration data are needed. Hard copies of this information are requested.
4. Data analysis and results from each interval tested. These should include records of fluid production and methods of measurement during the tests. If slug tests were used, there is a need to know which intervals were tested in this manner and the history and analysis of all such tests. Hard copies of the above information are requested.

5. Types and analysis of geophysical well logs.
6. Hole conditions during and results of borehole tracer (or any other) tests to determine rate and direction of fluid movement in the boreholes under static and dynamic conditions.
7. What information was available prior to 1978, what was the source of this information, and how was it used? Particularly, there is a need to know the history of water-level changes in the Coal Creek Syncline area and the history of ground-water mounding in both the shallow (unconsolidated) and deeper (basalt) units.
8. Distribution and history of pumpage both in and near the reservation and measured effects on potentiometric surface(s). This should include effects of applied irrigation water and development on the Columbia Plateau.
9. Water levels used for calibration of the latest model and methods of measurement. Hard copies of potentiometric maps of each model layer with data points and dates of measurement are requested.
10. Hydraulic-conductivity distribution used in the latest model and methods of determination. Hard copies of hydraulic-conductivity maps for each model layer are requested.
11. Distribution of vertical hydraulic conductivity between model layers and methods by which values were obtained. Hard copies of the above mentioned distribution of values in map form are requested.
12. Distribution of storage coefficients used in the latest model and methods by which values were obtained. Maps for this distribution in each model layer are requested.
13. Effect of changed river stage (due to dams) on both shallow and deep aquifers.
14. Major inorganic chemical data with sample collection and treatment methods. Hard copies of data by sample, date, borehole number, and depth interval are requested.
15. Sampling and analytical procedures for nonconservative properties. Hard copies of data by sample, date, borehole number, and depth interval are requested.
16. Isotope-sample collection, treatment, and analysis with particular attention to carbon-14. Hard copies of data by sample, date, borehole number, and depth intervals are requested.

17. Trace-element sample collection and analytical methods. Hard copies of data by sample, date, borehole number, and depth interval are requested.

In addition, the following items need to be addressed:

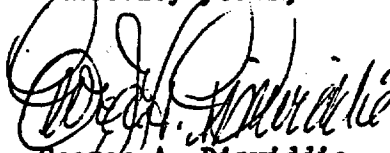
18. Chemical and isotopic analyses of uncontaminated ground-water from the unconfined aquifer. Hard copies of the data by sample, date, and source are requested.
19. Locations of areas and rates of the recharge and discharge used in the latest model.
20. Effects on ground-water flow by prominent structural discontinuities such as Gable Mountain and Umtanum Ridge. What is the evidence for such, if any, effects?
21. Use of chemical data for interpretation of the ground-water flow system.
22. Treatment of external and internal boundaries for the latest, far-field model.
23. Degree of confidence in continuity and areal extension of consistent geohydrologic characteristics of the basalt flow.
24. Data on effective porosity, how the data were obtained (or derived), and how the data will be used in the transport model.
25. Data on state of stress and how they were collected. Hard copies of these data by depth, hole number, and date are requested.
26. Knowledge of composition of rock and fracture filling.
27. Knowledge of seismicity history and potential.
28. Description of type of models of ground-water system and transport to be used and the various options (i.e., double-porosity, equivalent porous media, etc.)
29. Knowledge of material properties and data from laboratory tests. Hard copies of summary charts of the tests are requested.
30. Plans for in-situ tests to determine rock-mass properties.
31. It is our understanding that additional data have been acquired since the SCR was issued. What are these data and what is the significance or impact, if any?

32. Summary presentation of acknowledged major, unresolved, technical issues.
33. Summary presentation of plans to address and resolve these issues.

We recognize that this request for data and information represents a formidable agenda. However, we feel that it is important in order to have a clear picture of the details of the total program. Obviously, the agenda is aggressive and will not accommodate lengthy excursions. With such a lengthy agenda, we obviously will not be able to delve into many of the issues at great length without shortchanging others; even so we would appreciate the opportunity to ask questions as we go. We hope you will be able to chair the sessions so that we can maintain an active dialogue with all parties participating.

Again, let me express our appreciation to you and to all the participants. This is obviously a significant interruption of already overcommitted schedules, and we will make every attempt to make the effort worthwhile. If the USGS can contribute to improving the ability to characterize the Hanford Site and thus contribute to progress and success in this important national program, the time will have been well invested by all.

Sincerely yours,



George A. Dinwiddie
Coordinator,
High-Level Radioactive Waste Program

Copy To:

William Bennett, DOE
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Ralph Stein, DOE

cc:

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ACH/R&TC--MS 414
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