

JUL 23 1981

WM-10

PDR

(Return to WM, 623-SS)

MEMORANDUM FOR: Hubert J. Miller, Chief
High-Level Waste Technical
Development Branch

FROM: Paul T. Prestholt
High-Level Waste Technical
Development Branch

SUBJECT: PLAN FOR CONDUCTING BWIP EARLY SITE REVIEW

Attached is a copy of the BWIP Site Review Plan that was prepared at your request. This review would replace a review of the BWIP Site Screening Report, which was cancelled by DOE. When completed, it is intended to satisfy NMSS Program Plan Milestone #31111.

ORIGINAL SIGNED BY

Paul T. Prestholt
High-Level Waste Technical
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Enclosure
As stated

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Plan for BWIP Review

Background

The early site review plan detailed in this memo is intended to take the place of the review of DOE's "Site Screening Report". That review would have been completed in September 1981 and would have been concerned with the site specific geologic and hydrologic characteristics that led DOE to select its primary site on the Hanford Reservation. DOE has now selected a primary site; however the Site Screening Report has been cancelled.

10 CFR 60 subpart A requires DOE to submit a "Site Characterization Report" (SCR). That report is the next formal DOE submittal that the NRC is now scheduled to receive. We expect it to be submitted about mid-1982, approximately 6 months prior to the time that DOE intends to sink a shaft at a site located in the Cold Creek Syncline. DOE considers this the best location for a repository on the Hanford Reservation. This six to seven month review will include a period of 90 days for public comment on the staff's report. The staff report, therefore, must be completed within several months of receiving the DOE submittal. Extensive preparation by the staff before receipt of the SCR is required.

To date, the NRC has received about 180 technical reports relating to the siting of a geologic repository at Hanford. These documents contain data on every phase of the BWIP site investigation including geology, surface and subsurface hydrology, geochemistry, rock mechanics, and repository design. It is expected that the majority of the data that will be presented in the SCR is contained in the documents in the BWIP library.

Therefore, an early review of the Hanford site can be made using these documents. The Project Manager (PM) has sorted through the 180 reports, selected the ones that are likely to be important in an early site review and identified them as to siting or design as the principal areas of interest. These are listed in Attachment 5.

Purpose

An early review of the Hanford site can give the staff a needed head start on the review of the SCR. DOE's current schedule calls for the start of construction of the underground test facility in December 1982. There will be a very tight schedule for the review of the SCR, possibly as little as six or seven months from receipt of the SCR to DOE's planned start of construction of the underground test facility. This, together with the fact that there will be competing staff activities, at the time of SCR reviews suggests that an early site review by WMHT and WMHL staff would be a valuable activity. In addition, this review can serve to prepare those staff members who are now unfamiliar with BWIP for the SCR review.

The early site review suggested here would be different than previous staff efforts connected with BWIP. This would be a coordinated, balanced review that would focus on how the site compares with the criteria of 10 CFR Part 60 rather than assessing the technical quality of individual DOE reports which are routinely reviewed as received. The review would use these documents, taken together, to formulate specific concerns regarding the Hanford site. These concerns would be documented in a final report. The report could form the basis of a letter to DOE informing them of which issues will need greatest attention in the SCR and what kind of attention might be most appropriate.

Program for Review

The goal of the early site review proposed here would be to measure the Hanford site against the criteria of 10 CFR Part 60. This would be done using the information that is available in DOE technical reports. Beyond making preliminary evaluations of the adequacy of the Hanford site, this effort will document the current status of DOE data gathering and development work which will permit final assessment.

In reviewing the BWIP documents and in consultation with the technical staff, the PM has developed a preliminary list of 18 major BWIP issues under the headings hydrology, geochemistry, tectonics, and design. The list is attached as attachment 4. These issues represent what the staff now considers are potentially serious problems in siting a repository at Hanford. By integrating a review of the BWIP technical documents with a development of the listed issues, an understanding of the geologic setting of the Hanford site and of the geologic and design problems in constructing a repository will be achieved by the WMHT and WMHL staffs before they receive a SCR.

It is expected that the development of the 18 listed issues will generate other issues of equal or greater importance and that they will be dealt with in the same manner as the listed issues. The detailed plan for accomplishing the issue development and document review is attached as attachment 1, a schedule is attached as attachment 2.

It is expected that staff input to the P.M. will be received by August 14, 1981. A draft, or working report will be completed by August 25, 1981. A final report is scheduled for September 11, 1981 in time for the planned staff trip to BWIP. An early draft of the report may be used in identifying to DOE in advance of the trip of what issues we will be intending to review with them.

To date, NRC activities relating to DOE HLW disposal sites such as the site visits to BWIP, NTS, and dome and bedded salt have been largely for the purpose of gathering information. It was not intended in these past cases that conclusions be drawn as to the seriousness of geologic problems observed or whether or not the observed problems could be resolved. Conversely, the BWIP Review outlined here and in the attached plan is designed to assess issues (problems) relating to a possible repository at Hanford, more critically -- to assess the importance of the issues and the possibility of successfully resolving them.

This task will be accomplished by performing a coordinated, balanced review that will focus on the BWIP site and will utilize DOE, RHO, and NRC contractor documents (LBL, LLL, Golder) together. Two Golder Associates reviews dealing with the Preconceptual Design and the Test Shaft Plan will be received in early August. These documents will be reviewed as a part of this exercise. A Golder review of the Functional Design Criteria and Corps of Engineer reviews of the geology and hydrology of the BWIP will be received after the August 14 deadline. These documents will not be part of this exercise but will be checked so as to avoid possible contradictions.

An LBL report identifying major hydrological and geochemical issues is due on September 30. Interactions with LBL prior to completion of that report will assure that the issues addressed will be consistent with the issues listed in attachment 4.

The WMHL Performance Assessment Section will not be ready for formal interaction with the WMHT staff prior to the final report deadline of Sept. 30, 1981. However, since WMHT is in serious need of hydrogeologic help, WMHL will cooperate informally as their schedules permit. With this exception, therefore, no direct cooperative effort between the WMHT and WMHL staffs is planned. However, informal interaction between staffs is encouraged and will be actively pursued by project management.

Given the tight schedule and conflicting demands on staff time, this can only be a best effort. It is expected that some issues may go unidentified and that some data may be overlooked; nevertheless, this effort can serve both to educate the technical staff with regard to BWIP issues and to give additional focus to those issues.

ATTACHMENT 1

Procedure

1. A staff member will be assigned the lead for each technical discipline. The disciplines and suggested staff assignment are:
 - a. Hydrology and Stratigraphy - Robert Johnson
 - b. Geochemistry - Don Alexander
 - c. Structure and tectonics - Martha Pendleton
 - d. Seismology - Paul Prestholt
 - e. Environment - Ron Uleck
 - f. Repository Design - Ludwig Hartung

2. Each lead staff member will be assigned one or more of the primary issues for formal development. The "Standard Format and Content Guide" will be used as a basis for issue development as follows:
 - a. WMHT Siting Group will use chapters 13 and 14
 - b. WMHT Design Group will use chapters 15 and 16

Some paragraphs in each chapter are not applicable to every issue. Each lead staff member, with the approval of the P.M. will select those paragraphs appropriate to the issue under development.

3. It is anticipated that the WMHT staff will identify issues, other than the assigned issues, as they research the assigned issues. Issues, other than the 18 assigned issues, will be termed "secondary" issues. Secondary issues will be treated in the same manner as the assigned issues.
4. As each issue development is completed, the text will be given to the P.M. The text need not be typed, double spaced hand written text will be satisfactory.
5. The P.M. will edit, assess the applicability of the secondary issues to 10CFR60, and prioritize the primary and secondary issues. A typed presentation of the prioritized issues, in the format of the S.F. & C.G., will be prepared.
6. The P.M. will meet with branch management and those issues of particular importance and interest to branch management will be discussed and incorporated into a final report. The suggested format of the final report is found in attachment 3.

SCHEDULE

Start review	July 13
Staff input to PM	August 14
PM completes draft report *	August 25
Management review complete	September 4
PM completes final report	September 11

* Individual staff will review and comment on their sections as the draft is developed.

BWIP EARLY REVIEW FINAL REPORT FORMAT

- I. Introduction
- II. Statement of Issues
 - 1.0 Issue
 - 1.1 Statement of Problem
 - 1.2 Importance of Problem
 - 1.3 Resolution of Problem
 - 1.4 Applicable Sections of 10CFR60
- III. Summary and Conclusions
- IV. References
 - III.1 A brief disucssion of the completeness and accuracy of the data contained in the documents.
 - III.2 References listed by organization and author

Geotechnical and Design Issues
In The
Pasco Basin
Partial List

Hydrological

1. Sources of recharge and locations of discharge in deep and intermediate flow systems.
2. Structural (geological) features controlling groundwater flow patterns. Major (regional) folding?
3. Climatological or land use changes and their effects on groundwater flow patterns.
4. Vertical permeability of basalt flows and vertical communication between flows and within flows, especially between the colonade and entablature.
5. Lateral homogeneity of the Umtanum basalt.
6. Identification of hydrostatic units; regional, intermediate, local.

Geochemistry

1. The establishment of the solubilities of radionuclide bearing phases in the BWIP waste/water/rock system
2. The characterization of the mineralogy of fractures, establishing likely phase transformations of the fracture filling minerals under anticipated repository conditions and the effect these changes will have on permeability.
3. The measurement of the sorptive capacity (kd) of the secondary mineral phases which line fractures.
4. The petrological and mineralogical characterization of the Umtanum Unit.
5. Use of geochemical techniques as a tool for evaluating the hydrological question of vertical communication among aquifers.

Tectonics

1. The effect of the Pleistocene faulting found on Gable Mountain on repository integrity.
2. Definition of the regional stress field.
3. Analysis of seismic hazard - surface and subsurface.
4. Assessment of future tectonic stability.
5. Fracture characterization, surface and borehole (core).

Design

1. Compatibility of in-situ tests with the test facility and of the test facility with the repository.
2. Compatibility of the design of the test facility and the conceptual design of the repository with the geotechnical characteristics of the site.
3. Compatibility of the repository with proposed backfill and shaft sealing techniques.

BWIP Document Review List

Siting -

1. RHO-BWI-LD-24, "Identification of Candidate Sites Suitable For A Geologic Repository In Basalt Within Hanford" H-23
2. RHO-BWI-C-62, "Site Locality Identification Study, Vols. I & II H-42
3. RHO-BWI-ST-4, "Geologic Studies of the Columbia River Plateau" H-1
4. RHO-BWI-ST-5, "Hydrologic Studies Within the Columbia Plateau" H-2
5. RHO-BWI-1004Q, "BWIP Quarterly Report" H-141
6. RHO-BWI-SA-83, "Radionuclide Release Scenario, Selection Process for a Possible Repository In Basalt" H-137
7. RHO-BWI-C-82, "Bibliography of the Geology of the Columbia Plateau and Adjacent Areas of Washington" H-121
8. RHO-BWI-80-100, "BWIP Annual Report, Fiscal Year 1980" H-61

Design -

1. RHO-BWI-C-66, "Preliminary Geochemical and Physical Testing of Materials For Plugging of Man-Made Accesses To a Repository In Basalt"
2. RHO-BWI-C-67, "Preconceptual Systems and Equipment For Plugging Of Man-Made Accesses To A Repository In Basalt"
3. RHO-BWI-CD-2, "Nuclear Waste Repository In Basalt - Preconceptual Design Guidelines"
4. RHO-BWI-CD-22 Rev. 1, "Preconceptual Design Management Plan, Basalt Waste Isolation Program Basalt Repository"
5. RHO-BWI-CD-35, "Nuclear Waste Repository In Basalt Project B-301, Preconceptual Design Report"
6. RHO-BWI-CD-38 Rev. 1, "Nuclear Waste Repository In Basalt, Project B-301, Functional Design Criteria"
7. RHO-BWI-CD-39 Rev. 1, "Nuclear Waste Repository In Basalt Project B-301 Conceptual Design Plan"
8. RHO-BWI-CD-49 Rev. 1, "Test Plan For An Exploratory Shaft Test Facility in Basalt"

9. RHO-CD-132, Rev. 3, "Basalt Waste Isolation Program Plan"
10. RHO-BWI-LD-19, "Technical Requirements for Qualification of a Potential Nuclear Waste Repository Site in Basalt"
11. RHO-BWI-LD-23, "The Functions Of An Engineered Barrier System For A Nuclear Waste Repository In Basalt"
12. RHO-BWI-SA-51, "A Technical Approach To Resolving Issues On Rock Mechanics As Applied To Development Of A Nuclear Waste Repository In A Crystalline Rock Formation"
13. RHO-BWI-SA-50, "Sealing A Nuclear Waste Repository In Columbia River Basalt: Preliminary Results"
14. RHO-BWI-SA-49, "Basalt Waste Isolation Project Borehole Plugging Studies - An Overview"
15. RHO-BWI-ST-7, "Engineered Barrier Development For A Nuclear Waste Repository Located In Basalt"
16. RHO-BWI-79-100, "Basalt Waste Isolation Project Annual Report - Fiscal Year 1979"
17. RHO-BWI-80-100, "Basalt Waste Isolation Project Annual Report - Fiscal Year 1980"