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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

January 16, 1986

MEMORANDUM: Robert E. Browning, Director
Division of Waste Management

FROM: F. Robert Cook, Senior On-Site Licensing Representative, Basalt Waste Isolation Project (BWIP)

SUBJECT: OBSERVATIONS, COMMENTS AND RECOMMENDATIONS FOR THE PERIOD NOVEMBER 30, 1985 TO JANUARY 10, 1986

TECHNICAL ITEMS

1. Waste Package--

a. BWIP continues to work on the Advanced Conceptual Design report. It is now expected that this major report will be completed by the end of March, 1986. The "Waste Package Preliminary reliability Analysis Report" which I mentioned in my previous report is now scheduled for completion by the end of February.

b. Completion of BWIP's "Waste Package Materials Testing Science Plan" is being delayed even though significant materials testing is on going and planned. Attachment A identifies activities in these categories. RHO has indicated that a delay in this plan will not delay any other Waste Package milestones. With this conclusion on BWIP's part it is apparent that test planning is still not a prerequisite to testing in the waste package area. This appears to be significant departure from or non-compliance with design control principles and is analogous to the problem recently highlighted in the hydrologic testing area at BWIP by the Staff in meetings with the DOE. It points out that there are still ineffective controls on testing in this area, potentially warranting additional discussions with DOE to highlight a general problem with the control of testing at BWIP.

2. Repository Engineering--

a. RHO is proceeding with the repository advanced conceptual assuming there is no MRS facility in the system and with the assumption that consolidation of fuel rods will occur at the repository. This is a major feature of the repository which to my knowledge waste management staff has not addressed in detail. Consideration should be given to this item in future workshops with DOE.

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3. Geology--

a. I recently learned that RHO has chemistry data from chip samples from three deep commercial wells off the Hanford reservation, including the well on Saddle Mountain about 15 miles North of the RRL, recently drilled by Shell Oil Corp. The chemistry of the chip samples was determined by a laboratory at Washington State University under contract to RHO. Data on the depth of the chip samples received from Shell is considered by RHO to be proprietary and not releasable to the public at this time. As a result of my interest in the data, RHO and DOE decided to return part of the information they received from Shell concerning the key to the depth location of the chip samples from the well so as not to be subject to potential violation of the proprietary nature of the information.

Although I indicated that NRC has provisions for handling information which is proprietary they apparently felt the data may escape NRC's control and fall into the hands of our contractors. The action taken by RHO with DOE's apparent approval effectively prevents the Staff from assessing the stratigraphic data previously available to the DOE and RHO and still available to them in the way of unwritten knowledge about the geology of the environs.

The information concerning the location of the chip samples in the Shell well may be released by Shell in April of this year when other information provided to the State by law becomes public information.

b. The handling of the information from the Shell well raised questions in my mind as to how RHO and DOE receive and enter information into their document control system, particularly geoscientific/geotechnical information. It appears controls are ineffective in this area. I have discussed this issue with DOE/RL. I have requested procedures for handling proprietary data, whether it is company proprietary or proprietary per separate agreement with a second party. (Data provided by the USGS concerning their assessments of groundwater water levels in the area around Hanford falls in this category.)

I am particularly interested in understanding DOE's and RHO's labeling requirements for information which is proprietary in any regard so as to be alerted to that status during my reviews and to know to take necessary actions to protect the information.

If NRC has any agreements with DOE concerning sharing of such information, I request that these provisions be forwarded to me for by knowledge and use. I am aware of provisions for handling classified information in this regard. Also provisions with the USGS in this area would be of interest to me, since it may provide for my access to the DOE/RHO/USGS working group meetings from which I have been excluded in the past because of the proprietary nature of the information discussed at these meetings.

4. Performance Assessment--

a. Attachment C provides schedules for various activities in the performance assessment area.

b. RHO recently completed their Performance Assessment Plan (SD-BWI-PAP-003) and has submitted this to DOE for review and comment. This is the plan for coordinating the performance assessment activities throughout the project. I am requesting a copy of this plan for the Staff's information.

5. **Geochemistry--**

a. During the subject period DOE and RHO met with USGS representatives and other technical experts on the subject of hydrochemistry investigations for the BWIP Site. The major comment for the USGS was the need for better coordination among the hydrologists, geologists and hydrochemists in the planning of site investigations. I fully endorse the USGS observation. I reviews in these areas of BWIP planning should specifically focus on this issue of coordination among these technical areas.

b. The USGS indicated that they believe that the geochemistry of the groundwater will be significantly influenced by the presence of methane at saturation. They noted that this characteristic of the groundwater has not been factored in to models which account for dominate chemical reactions expected in the system.

c. Data was presented that sulfate disappears at about 2200 feet at the RRL and its environs, and that the presence of pyrite may be indicative of the reason the sulfate concentrations decrease at this depth. Understanding the origin and transport of sulfate was considered important in deducing the natural groundwater flow systems in and around the RRL.

d. It was suggested that the investigation of the presence of ethane and the organic acids should be accomplished to further understand the reactions and the Eh of those reactions associated with methane in the water. In addition the source of the methane may become clearer given data on the other organic substances noted.

e. A general conclusion from evaluation of the geochemical data is that the anticlines appear to be areas of vertical mixing in the Wanupum basalts. In the region around the RRL the Wanupum represents a zoning of transition between the Umtanum and the Saddle Mountains basalts.

f. From an overall viewpoint I consider the BWIP hydrochemistry group is taking aggressive, unbiased actions in their planning and investigation of the site. I will attempt to obtain the numerous viewgraphs presented to the USGS during the meeting for the Staff's information.

6. **Site/Environmental--**

a. The DOE's draft EIS for defense waste disposal is expected to be issued shortly. This document represents a major discussion of the site and is pertinent to repository concerns. Considerable review and comment time by the Staff should be allocated to this item. Major issues involve the definition of high level waste, the handling of mixed toxic wastes which may be present along with the high level wastes, and the definition of the inventory of radioactive nuclides

in the ground water system, including the vadose zone above the water table.

7. **Hydrology--**

a. Drilling operations have started on DC-24W and DC-23GR. Clearing and preparing a drilling location for DC-25 is also progressing. A drilling crew with a new RHO foreman with no on-site (Hanford) experience is being assembled for drilling DC-18 (for hydrochemistry). Coring operations in RRL-17 are also progressing. These operations occurring at once represent a considerable increase in the level of effort associated with on-site drilling operations. Attachment B contains a summary of planned activities.

b. As a result of the hydrology workshop in December, plans for large scale pump testing in February are being reconsidered. Currently there are no definite plans for this test.

8. **Quality Assurance--**

a. During the QA workshop with DOE early last year it was noted that the Systems Engineering Management Plan (SEMP) would be operational in October 1985. However, RHO has indicated that effort on the EA's and other planning-type documents, including the SCP, are causing the delays in test planning noted above in item 1b. This appears to be the main reason RHO management has used to justify delays in implementation of their SEMP which is intended to provide the vehicle to control R&D activities as well as other design activities. DOE (RL) appears to accept this reason in that testing, including site investigation and exploration testing, is allowed to proceed. Other motives for holding up full implementation of SEMP and its subordinate Science and Engineering Plans, unknown to me, may also exist. I recommend that this item be explored with DOE with the objective of obtaining a firm commitment date to complete and implement the SEMP design controls.

b. Implementation of other aspects of the BWIP Quality Assurance Plan is progressing. Subcontractors (under RHO technical direction) are slowly becoming more familiar with the scope of the Quality Assurance requirements and actions needed to accomplish effective implementation. Of concern is the realization that significant changes from current practices are being indicated and that it will be difficult to effectively implement the new requirements with an organization continuing in the major part of its activities under different incentives and controls. It appears warranted for the staff to carefully assess organizations which plan to operate under two or more separate quality assurance plans, given common problems with this mode of operation and probability for failure. It would also appear warranted to discuss this issue with DOE management to understand how they plan to resolve this potential problem in their prime contractors doing nuclear work not subject to the NRC's requirements, for example the on-site contractors, Westinghouse, PNL, Kaiser and potentially others.

c. There has been confusion in the BWIP project as to what the Staff means by the term "safety-related". I do not believe we have used the term consistently in our communications with DOE and their

contractors. The term is used in Part 50 Appendix B along with the term "important to safety" (which has a different meaning in the Appendix B context, given previous implementation of Appendix B, than its defined meaning in Part 60). If we use the term "safety-related" in our official documents, we should provide a definition which encompasses all issues related to public health and safety concerns, including isolation issues and Part 20 requirements on occupational radiological safety. These definitions, including the meaning of "important to safety" in the context of Part 50 Appendix B should be clarified in our QA review plan or other suitable document.

Also as noted in previous memoranda the definition of "design" is causing problems in the BWIP organization. The definition in the Atomic Energy Act for "design" should be incorporated into the QA review Plan or other Staff Technical Positions as appropriated. The definition of this term, which includes R&D information, is crucial in the establishment of the scope of design control procedures.

MISCELLANEOUS ITEMS

a. DOE/RL direction/notification to their contractors and subcontractors concerning Appendix 7 agreements on the ground rules for OR interactions still does not exist, and hence the provision in the agreement requiring such direction/notification is unfulfilled. This lack of action on DOE's part restricts free communication with some people within RHO and most people in subcontractors, since they are uncertain as to how to interact. Although I have raised the question with DOE (Mecca, Olson and Anttonen) five or six times over the last seven months no action has occurred. I recommend you take this item up with DOE to help achieve fulfillment of their agreements in Appendix 7.

b. DOE is planning to request NRC Staff interaction in readiness reviews of various activities which have been completed prior to proceeding to the next phase of the project. Their objective is to obtain Staff agreement as to the adequacy of the actions taken and/or plans for the future as they regard construction authorization or license to handle waste. These meetings (readiness reviews), involving NRC/DOE agreements, probably should be conducted under some formal agreement such as the Appendix 7 agreement. Such an agreement could clearly define the role of the Staff and establish the rules for other party interaction to observe or participate in the DOE/NRC interaction. I recommend that staff initiate preparation of such an agreement with DOE.

c. The activities noted in the area of waste package testing and site drilling warrant consideration of supplementary OR staff to cover them. I recommend that such assignments be made in the near future for about a week's time for each area.

Relative to assignment of additional OR personnel, DOE (Anttonen) has informed me that only one OR staff, i.e., me, will be allowed routine access to the on-site activities and project personnel. This DOE/RL position appears to be inconsistent with the provisions of Appendix 7. This item should be discussed with DOE headquarters personnel to reinforce the conditions of the Appendix 7 agreement to assure effective and free interactions in the future, including specific OR assignments considered warranted in the near future.

d. During recent discussions with RHO personnel I was informed that some of the procedures provided to me in the past which are pertinent to BWIP QA program may now be considered company proprietary. Some of the procedures in this category are noted in Attachment D, which is a memorandum I provided to DOE (Mecca) upon receipt of the requested documents. I noted to the RHO representative that some of the documents may be in our public document room (I have not done a check), however, I thought that documents associated with their QA system were of significant public interest and should not be considered proprietary in the future. I have advised DOE/RL of this issue and my inclination as to the appropriate category for such BWIP documents. This item along with other issues associated with the handling of proprietary information should be considered and resolved with DOE with establishment of some clear cut guidance as to what information is appropriately restricted from the public's purview within the provisions of NWPA.

F. Robert Cook

F. Robert Cook, Senior
On-Site Licensing
Representative, Basalt
Waste Isolation Project
(BWIP)

ATTACHMENTS A THRU D.

cf:
JOBunting
HJMiller
MRKnapp
JMHoffman
JTGreeves
PTPrestholt
TRVerma
FRCook
ACGiarratana
OLOlson

MILESTONE NUMBER	TITLE	DUE DATE	FORECAST DATE	% COMPLETE YTD PLANNED	% COMPLETE YTD ACTUAL
L2K01	Report on "Release Behavior of DWPF DHLW Glass in an NWRB"	1/86	1/86	40%	40%
L2R01	Complete Draft Waste Package Materials Testing Science Plan	2/86	5/86	5%	0%
L2R02	Complete Draft Waste Package Performance Analysis Engineering Plan	5/86	5/86	0%	0%
L2R03	Complete Draft Waste Package Design and Development Testing Engineering Plan	6/86	6/86	0%	0%
L2R05	Complete Draft Waste Package Qualification Testing Engineering Plan	9/86	9/86	0%	0%
L2K02	Evaluate Iron and Copper-Base Container Materials and Submit Report	9/86	9/86	16%	7%
L2R04	Update BWIP Design Data Package (DP-001)	9/86	9/86	13%	13%
L2K03	Report on "Spent Fuel Radionuclide Release Characteristics"	9/86	9/86	12%	12%
L2P01	Complete "Advanced Conceptual Design Supplemental Report"	9/86	3/87	16%	4%
L2K04	Complete Sensitivity and Uncertainty Analyses of the Waste Package	9/86	9/86	16%	9%
L2E1EM2	Submit "Waste Package Advanced Conceptual Design Report for Three Waste Forms"	9/85	3/86	100%	95%
L2F13N	Submit "Waste Package Preliminary Reliability Analysis Report"	9/85	2/86	100%	96%
1.2 Waste Package					
L2D4W	Begin Hydrothermal Replication Testing		4-30-86	4-30-86	5 5
L1-Systems					
L1E4-1	Issue final report on "Development of Incident/ Accident Statistics for Preclosure Safety Assessment"	7/86	7/86	14%	14%
L2-Waste Package					

L2C1P	Complete nitric acid and solubility test and issue annual report.	9/85	10/85A	100%	100%
L2D2R	Issue report summarizing the copper-base materials slow-strain-rate behavior.	3/86	3/86	18%	0%
L2D3P	Start up pressure vessel.	10/85	12/85	100%	90%
L2D3P	Start titanium system fabrication.	2/86	2/86	40%	40%
L2D3P	Issue solubility topical report.	3/86	3/86	33%	33%
L2D3P	Issue topical report on surface studies.	7/86	7/86	19%	19%
L2D4P	Issue formal report summarizing the results of test programs with fully-loaded glass.	11/85	11/85A	100%	100%
L2D4P	Issue informal report on the status of zircaloy experiments under hydrothermal waste package conditions.	3/86	3/86	33%	33%
L2D4P	Issue formal report on the results of the first matrix of tracer injection experiments.	5/86	5/86	25%	25%
L2D4P	Issue informal report on the hydrothermal experiments using copper.	6/86	6/86	22%	22%
L2D4P	Issue formal report comparing solution results of two initial 300°C runs with 200°C runs.	8/86	8/86	18%	18%
L2D4P	Complete a formal status report on the results from STF testing.	8/85	12/85	100%	85%
L2D4R	Improve pH sensors and deliver working units.	7/86	7/86	21%	16%
L2D4R	Improve reference electrodes and deliver working units.	7/86	7/86	21%	11%
<u>L3-Site</u>					
L3E2B	Issue progress report on recirculating basalt column studies.	7/86	7/86	18%	18%
L3E2B	Issue progress report on radionuclide sorption studies.	9/86	9/86	17%	17%
L3E2C	Develop testing procedures for ^{220}Rn and column studies.	9/86	9/86	13%	13%
L3E2C	Issue draft of report on "Uranium/Thorium Disequilibrium in Basalt Groundwater: In Situ Retardation Coefficients"	9/86	9/86	10%	10%

Attachment B

MILESTONE NUMBER	TITLE	DUE DATE	FORECAST DATE	% COMPLETE YTD PLANNED	% COMPLETE YTD ACTUA
3C GEOLOGIC CHARACTERIZATION					
L3R06	Submit Grande Ronde Stratigraphic Paper for Clearance	8/86	8/86	19%	15%
L3R04	Complete New Velocity Model Earthquake Locations	5/86	5/86	12%	10%
L3K06	Complete a Position Paper on Tectonic Model(s)	9/86	9/86	13%	10%
L3R03	Complete Letter Report on Intraflow Structure of Cohassett, East Sentinel Gap	3/86	3/86	33%	32%
L3K03	Submit a Position Paper on Need for Deep Borehole	6/86	6/86	0%	0%
L3K[illegible]	Submit Document on Disruptive Geologic Scenarios	9/86	9/86	5%	0%
L3K07	Submit Document on 3-D Stratigraphic and Structural Model	9/86	9/86	16%	10%
3D HYDROLOGIC CHARACTERIZATION					
L3R02	Issue LHS Test Plan	12/85	12/85	64%	64%
L3K02	Initiate Grande Ronde LHS Testing	11/85	2/86	100%	50%
L3K04	Complete 1 (LHS) Test prior to Start of ES Drilling	8/86	8/86	0%	0%
L3R08	Complete RRL-2 LHS Test Analysis Status Report	9/86	9/86	0%	0%
3E GEOCHEMISTRY					
L3R09	Submit Status Report on Mineralogy/Petrology of Sedimentary Interbeds	9/86	9/86	10%	8%
L3R05	Electron Microprobe Analysis of Basalt Flows	5/86	5/86	27%	27%
L3R01	Draft Letter Report on Additional Hydrochemistry Wells	10/85	10/85	100%	100%
L3K08	Complete Far-Field Sorption Report	9/86	9/86	0%	0%
L3F DRILLING					
L3K01	Initiate Drilling of Hydrochemistry Hole DC-18	11/85	1/86	100%	50%
L3R01	Complete Hydrochemistry Borehole DC-18	9/86	11/86	0%	0%
L3K05	Complete Drilling and Instrument Piezometer Boreholes	8/86	8/86	0%	0%
L3K02	Initiate Drilling DH Series Boreholes	11/85	1/86	100%	25%
L3K09	Complete One RRL Core Hole	9/86	9/86	0%	0%

Attachment C

MILESTONE NUMBER	TITLE	DUE DATE	FORECAST DATE	% COMPLETE YTD PLANNED	% COMPLETE YTD ACTUAL
L1M02	Provide Draft System Engineering Management Plan (SEMP) to DOE-HQ	02/85	05/86	100	80
L1K11	Establish Technical Procedures System	07/85	04/86	100	90
L1K08	Verification and Benchmarking of CHAINT	12/85	10/85 A	95	100
L1K02	Technical Reports for PORFLO and MAGNUM 3-D Codes	01/86	01/86	75	80
L1K05	Update the Performance Assessment Reference Data Source Document	07/85	08/86	100	1
L1M01	Update Performance Assessment Plan	11/85	11/85 A	100	100
L1R01	Transmit Interim Project Plan to DOE-RL for Review	12/85	03/86	62	70
L1K01	Complete Rockwell Approved Management & Integration Plan.	12/85	09/86	66	0
L1R02	Draft BWIP MGDS Requirements Document to DOE-RL for comment or approval	01/86	03/86	50	40
L1R03	FY 1986 System Engineering Transition Completed to Support ES Drilling	08/86		20	20
L1K03	Baseline System Description Document to DOE-RL	09/86		12	0
L1K04	Test Plan for Validation of Waste Package PA Codes	09/86		10	!
L1K07	Update Assessment of Site Subsystem Performance	09/86		5	!
L1K06	Update Assessment of Waste Package Subsystgem Performance	09/86		5	!