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MEMORANDUM FOR: Malcolm R. Knapp, Chief
Geotechnical Branch
Division of Waste Management, NMSS

FROM: Kristin Westbrook
Geology/Geophysics Section
Geotechnical Branch
Division of Waste Management, NMSS

SUBJECT: TRIP REPORT FOR HANFORD HIGH LEVEL NUCLEAR
WASTE SITE - MAY 29-31, 1985

On May 29, 30, and 31st, 1985, I attended meetings in Richland, Washington for the Basalt Waste Isolation Project (BWIP) with the Department of Energy and Rockwell Hanford Operations. The purpose was to improve NRC's understanding of the geologic characterization program for high level nuclear waste siting at Hanford. The objectives of the trip were met in three ways: 1) obtaining a better understanding of and discussing information systems and procedures that may inform NRC of site characterization activities; 2) discussions of current geoscience activities and; 3) examination of core samples.

I. Information Systems and Procedures for Knowing About BWIP Geoscience Work

On May 30, 1985, I met with DOE/RHO and the first part of the meeting was spent discussing information systems and procedures (see Enclosure 1, Summary Meeting Notes - Attachment 2). As indicated in the summary meeting notes, several ideas were discussed but no conclusions were reached.

The most significant topic in our information system discussions was about cataloging and release. During the meeting between the DOE and State and Indians on May 29, 1985, I found the following RHO uncataloged volumes:

- (1) Geophysical Anomaly Status File
Aeromagnetics by Aeroservice
Altitude: 5500 feet [1680m] 1980
- (2) Geophysical Anomaly Status File
Seismic Reflection
Seismograph Service Corporation
Lines 1-8, 1979
Lines 9-14, 1980

WM Record File

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WM Project 10

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(3) Geophysical Anomaly Status File
Integrated Interpretation of
Magnetotelluric, Gravity, and
Aeromagnetic Data
Mitchell and Bergstrom
BWIP, 1983

The existence of uncatelogsed information was discussed with DOE/RHO during our meeting on May 30, 1985. I was told by RHO that they have many "working files" and other "in house" information for site characterization studies as part of ongoing data integration. DOE/RHO indicated their need to be very cautious about releasing information that might turn out to be poor after updated or better integrated interpretations.

RHO indicated that all information releases must be cleared by DOE after peer review. However, for internal Rockwell information such as working files, there does not seem to be a numbering or cataloging system and DOE has no apparent means for using clearance processes.

I pointed out that integration of information will be ongoing in the geosciences and other fields throughout the project and using the same logic as was presented for "working files" no information would be released until site characterization activities were completed.

Follow-up

My discussions with R. Wright and NRC's BWIP team lead to:

- (1) A June 17, 1985 letter from R. Wright (NRC) to O. L. Olson (DOE) requesting a meeting about the BWIP Data, Handling, Storage, and Reporting System (see Enclosure 2).
- (2) A June 19, 1985 letter from R. Wright (NRC) to O. L. Olson (DOE) "Suggestions for the Accession List" (see Enclosure 3).
- (3) A June 20, 1985 letter from R. Wright (NRC) to O. L. Olson (DOE) Formal request for DOE's response to 29 Information Items (see Enclosure 4).

Also, RHO said that the aeromagnetic survey for "working file" #1 (listed above) is summarized in report RHO-BWI-ST-14. However, a review I did after my return shows this survey was not adequately summarized (Enclosure 5).

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II. Current Geoscience Activities

I attended a DOE Quarterly Geoscience Status meeting for the State and Indians on May 29, 1985. During the meeting, several current activities were mentioned (see viewgraphs - Enclosure 6). Of major significance was a viewgraph listing "working files" for Seismicity and Photolineaments. The major topic presented at this meeting was by Al Rohay on the results from a large scale seismic refraction survey done by USGS in 1984. Data summaries and very general analyses of this refraction survey are reported in RHO-BW-SA-435 P.

In Al Rohay's presentation and report RHO-BW-SA-435P indications are that the refracting interface between the basalts and the underlying sediments is different along RAW than under other anticlinal trends. For the station at Rattlesnake Mountain the refracting horizon is at a shallow depth even beneath this highest elevation station. Other anticlines have horizontal refracting horizons that remain horizontal at the basalt sediment interface even with increasing elevation (RHO-BW-SA-435P, pages 1 and 2). This study tends to support an interpretation of RAW as being comparatively vertical as would be expected for a structure capable of lateral (strike-slip) motion.

In my meetings with DOE/RHO on May 30, 1985, most of the day was spent discussing current geoscience activities (summarized in Enclosure 7). I expressed the NRC's position which calls for consultations prior to studies being conducted. I specifically emphasized the importance of NRC/DOE consultations on tectonic modeling assumptions, investigations of RAW, and the effects of the 1984 refraction study on velocity models and earthquake locations and analyses prior to implementation of assumptions or results.

Follow-up

A review of "working files" for seismicity is needed. Photolineament "working files" should also be reviewed.

The seismic refraction study has not been analyzed for nuclear waste repository siting. The implications of the findings on tectonic stability and natural resources remain unaddressed. RHO maintains that additional analyses of the work are planned. No specific plans or time frames were outlined.

A member of NRC's geology/geophysics section should attend the DOE's Quarterly Geoscience Status Meeting for the State and Indians. This activity may be combined with assignment to the ORs office for the purpose of reviewing "working files."

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One of the items discussed on May 30, 1985, was about a DOE/RHO meeting with R. Couch of Oregon State University in April 1985 on tectonic modeling as shown on a DOE supplied activities list (see Summary Meeting Notes). A. Tallman (RHO) began to speak about R. Couch's model and stopped because she wanted to speak from her notes but we ran out of time before the notes were obtained. In a follow-up telephone conference with DOE/RHO on July 1, 1985, I was told that DOE/RHO would not agree to discuss their meeting with R. Couch.

I talked to R. Couch some time before DOE/RHO met with him. His work on tectonic modeling for the Columbia Plateau has been ongoing for years and while unpublished, the results have been discussed at many professional meetings. The highlights of R. Couch's ideas are in Enclosure 7 under Tectonic Models. It may be interesting to note: If R. Couch's ideas about deep vertical faults (associated with large grabens) being activated by current movement along RAW/CLEW, and faults forming hydrocarbon traps in sub-basalt sediments are accurate, this might not have favorable implications for siting a high-level nuclear waste repository at Hanford.

Core Library

On May 31, 1985, I visited the core library. A summary of the samples reviewed and information on relogging are in Enclosure 8. This visit was primarily for my benefit in obtaining a three dimensional understanding of selected core sample zones.

Follow-up

Examine the relogging records for the relogged holes listed in Enclosure 8.

Return to the core library to review additional samples of interest and to review new core samples.

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