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

Dear Mr. Olson:

Enclosed are our comments on RHO-BW-ST-19P "Preliminary Interpretation of the Tectonic Stability of the Reference Repository Location, Cold Creek Syncline, Hanford Site", March 1983. These are in the form of a write-up of the comments presented by Philip Justus in Richland on March 14, 1984, as part of the status workshop on BWIP geology.

If you have any questions on this material, please address them to Philip Justus (FTS 427-4684).

Sincerely,

"ORIGINAL SIGNED BY"

Robert J. Wright
 Senior Technical Advisor
 Repository Projects Branch
 Division of Waste Management

Enclosure:
 Comments on RHO-BW-ST-19P

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SUMMARY OF COMMENTS ON RHO-BW-ST-19P¹
PRESENTED AT DOE/NRC STATUS WORKSHOP ON BWIP GEOLOGY
BY PHILIP JUSTUS - MARCH 14, 1984²

It is difficult to separate a discussion of ST-19P from a discussion of topics that are the focus of this workshop. The NRC staff doesn't want to spend much time discussing a document that is based on two-year-old information which is billed as preliminary. Much of the introductory material presented by RHO yesterday was based on the ST-19P results and follow-up studies. RHO has mentioned those aspects of ST-19P work that are continuing or are being modified. The comments herein are only directed at selected topics and focus on how the presentation of information and conclusions can be improved.

The first topic we addressed was regional tectonic models. STP-19 contains a good summary of main concepts, but how these concepts constrain the local tectonic model is not analyzed. What is (are) DOE's preferred or working regional geologic model(s)?

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1. RHO-BW-ST-19P. "Preliminary Interpretation of the Tectonic Stability of the Reference Repository Location, Cold Creek Syncline, Hanford Site," March, 1983.
 2. Two NRC contractor reviews of RHO-BW-ST-19P were made available at the meeting. These had been placed in Public Document Rooms upon being received at NRC headquarters: Corps of Engineer report dated Oct. 31, 1983; Lawrence Livermore National Laboratory report dated September 28, 1983.

Our second topic addressed was local tectonic models. Models of the study area are emphasized in most of the figures, but how RAW is related to the RRL remains insufficiently analyzed. The Rattlesnake Mountain section is anomalous, but NRC sees no reason to exclude it from consideration and analysis of anticlinal structures. What is (are) DOE's preferred or working local tectonic model(s)?

The third topic addressed was tectonic modeling. The adequate evaluation of the potential impacts of tectonic processes necessitates conceptual models in which all available data are applied to alternative interpretations, both favorable and unfavorable to site suitability. The summary of regional tectonic models is useful reference material. Integration of data on seismicity, deformation, stratigraphy, structure, geophysics and plate tectonics which support or invalidate ideas is not presented for the various models.

The fourth topic addressed was the Rattlesnake Wallula Alignment (RAW). The need remains to completely describe the RAW parameters, such as timing of activity and tectonic character. Its effect on tectonic stability and potential seismic hazard remain to be evaluated.

The fifth topic addressed was Yakima Fold Belt. The east-west trend of Yakima folds is anomalous (for example, ST-19P, p. 3-5, Para. 3). No complete discussion of the Yakima fold belt anomaly or its implications for site characterization is given. A clarification of what is a typical Yakima fold or fold domain is needed. For example, Umtanum Ridge is considered typical

in some ways (ST-19P, p. 4-16, Para. 3) and the Snively Basin area typical in some ways (p. 7-19, Para. 2), yet both may be anomalous features (p.8-3, Para. 1). The development of and present stage in the development of the fold belt is not adequately accounted for.

The sixth topic to be addressed was the Pasco Basin. The summary of the basin geology and tectonic features lacks detail. For example, the intact block concept of the basin (p.2-5, Para 2; p. 8-5, Para. 4) lacks detail sufficient for making an evaluation of the concept as applied.

The seventh topic to be addressed was seismicity. The existing data are referenced but not critically evaluated. What is DOE's position on the maximum credible earthquake that might affect the RRL? What is DOE's position on the seismic hazard analysis of the WNP-2 nuclear reactor site? What is DOE's position on the significance of Holocene scarps on Toppenish Ridge and the typicality of Toppenish as a Yakima fold? The lack of historical seismic activity (p. 6-20, Para. 2,3) may not indicate absence of tectonic activity, especially in the 10,000 year timeframe. To demonstrate the alignment of hypocenters on thrust faults, cross sections across strike of suspected buried thrusts are needed. The recurrence relationships of earthquakes (p. 6-15 to 6-17) may or may not fit the data for larger earthquakes in this area.

The eighth topic to be addressed was deformation rates. The paleoslope projection method of chapter 5 disregards Rattlesnake Mountain. The Assessments of stability are based mainly on local deformation rates (in Pasco Basin area); relationships to surrounding regional deformation rates need to be established. Deformation rates may not be uniform; ranges of deformation rates commensurate with confidence in the data need to be expressed. Strain effects may concentrate on individual structures yielding larger displacements than those calculated from the assumption of uniform distribution of strain across broad belts. How is strain rate affected if imbricate fault models are used?

The ninth topic to be addressed was geophysics. Gravity values are relatively high beneath Pasco Basin. How does this fit the crustal model? The conclusion of p. 3-12 that existing geophysical data are insufficient to resolve subsurface structures/models needs to be underscored by plans to get the data based on an assessment of the significance of the targets.

The final topic was the manner of data presentation. There is not a tectonic map and a geologic map presented that is adequate for readers to comprehend the first and second order structural features discussed in ST-19P. Stratigraphic columns in different chapters are internally inconsistent and cause some confusion. The focal mechanism summaries can benefit from the graphic display of distribution of mechanisms used in the compilations. Some maps showing boreholes and faults were incompletely labelled;

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the scale of one was half of the actual scale. The Figure 4.7, geophysical anomaly map, is misleading because, for example, not all of the gradients present are labelled.

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