

MAR 11 1982

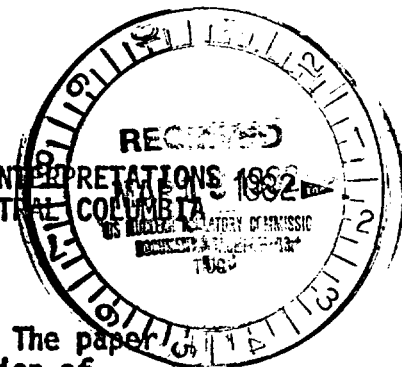
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MEMORANDUM FOR: Linda Lehman, WMHL
Ellen Quinn, WMHL

FROM: David L. Siefken
Low-Level Waste Licensing Branch

SUBJECT: REVIEW OF PAPER ENTITLED "GEOCHEMICAL INTERPRETATIONS OF GROUND-WATER FLOW SYSTEMS IN THE CENTRAL COLUMBIA PLATEAU"



As per your request, I have reviewed the subject paper. The paper presents a very interesting, and innovative, interpretation of the hydrogeochemistry of the ground-water systems in the Pasco Basin. Although admittedly suffering from the same sparsity of data and data points (wells) as other ground-water studies performed for BWIP, the paper demonstrates both chemically distinct water types for the shallow, intermediate, and deep aquifer systems and abrupt changes in hydrogeochemistry along the Columbia River for the intermediate and deep basalt aquifer systems. These observations, together with supporting structural and geophysical data, indicate there may be both structural control of the Columbia River from the horn to Richland and localized discharge of the intermediate and deep basalt aquifer systems and underlying sedimentary aquifers along that portion of the river.

The paper, therefore, is significant for primarily two reasons. First, the paper presents a substantially different interpretation of the deep ground-water flow systems using the same hydrogeochemical data used to support previous interpretations. Second, the paper ties together lines of evidence from several distinct disciplines to support the conceptual model and conclusions on the deep ground-water flow system. Perhaps the major shortcoming of the paper is the omission of references to supporting ground-water flow modeling studies performed by PNL and the USGS.

Given the uniqueness of the study and its significance to repository siting at BWIP, the paper should be published so that it can receive discussion from the technical community and hopefully stimulate further studies to support or refute the conceptual model and conclusions. Prior to publication, however, I recommend that the cited personal communications with NRC staff be replaced by citations of written communications. This then permits review, if requested, of the basis for the statements supported by the staff communications and removes a connotation of speculation or conjecture often associated with personal communications which are unavailable to anyone but the authors.

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Linda Lehman
Ellen Quinn

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Other than minor editorial corrections, I have few additional comments on the papers. I suggest that the figures follow the text rather than be interspersed within. I also suggest that the first paragraph on page 19 precede the discussion of factor 3 which is on page 12. In addition, the significance of Figure 16 is not well established in the text.

Please contact me if you have any questions.

Original Signed By

David L. Siefken
Low-Level Waste Licensing Branch

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