

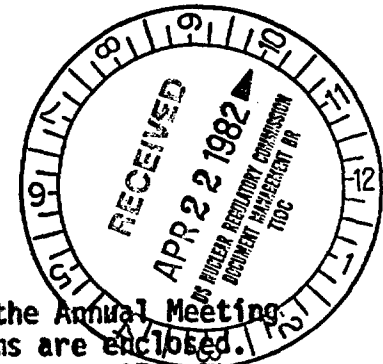
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Dr. Judith B. Moody
Office of Nuclear Waste Isolation
505 King Avenue
Columbus, OH 43201



Dear Dr. Moody:

Thank you for the opportunity to submit an abstract for the Annual Meeting of the Geological Society of America. The completed forms are enclosed. Either Linda Lehman or I expect to present the paper on October 17. The only limitation is the uncertainty of travel funds.

I will notify you if we anticipate any difficulty.

Sincerely,

ORIGINAL SIGNED BY

Ellen J. Quinn
High-Level Waste Licensing
Management Branch
Division of Waste Management

Enclosure: As stated *per E. Quinn, originals mailed - no cys made*

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A WORKING HYPOTHESIS OF GROUNDWATER FLOW SYSTEMS IN THE N^o CENTRAL COLUMBIA PLATEAU: GEOCHEMICAL DATA SUGGEST STRUCTURAL CONTROL AT DEPTH

LEHMAN, Linda L* and QUINN, Ellen J., U. S. Nuclear Regulatory Commission, Mail Stop 697-SS, Washington, D. C. 20555.

Factor analysis was applied to the Columbia Plateau water chemistry to investigate the regional groundwater flow patterns. The study area comprised a large portion of the Columbia Plateau although the Pasco Basin area was emphasized because of the data distribution. Water chemistry data from 85 wells within eight counties was the basis of this analysis. The analysis determined three factors which accounted for 75% of the variability in the data.

A hydrogeochemical model can be developed based on the distribution of the three factors. One factor, related to the variables sulfate, calcium, nitrate, specific conductivity and magnesium, is interpreted as representing water which has been recharged artificially from the extensive irrigation practices of the region. A second factor, associated with silica, iron, magnesium, potassium, and temperature, represents a basalt-equilibrated water. This water type is evenly distributed except in deep wells in the Pasco Basin where mixing with another water type is indicated. The third factor, which correlates with sodium, carbonate, chloride, fluoride, pH and specific conductivity, is not representative of water in most of the basalt sequence. This water type is thought to be associated with the older sedimentary sequence beneath the basalt. Upwelling of this water along the Columbia River is suggested by the decrease in the amount of basalt-equilibrated water and the increase in the sodium-fluoride water. A possible explanation for the discharge, represented by the geochemical anomalies in the well water, may be the presence of a deep linear structure or stratigraphic discontinuity such as a fault beneath the Columbia River. *Now at University of Minnesota.

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- 16 mathematical geology
- 17 micropaleontology
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- 19 paleontology/paleobotany
- 20 petrology, experimental
- 21 petrology, igneous
- 22 petrology, metamorphic
- 23 petrology, sedimentary
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- 25 Quaternary geology
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- 27 stratigraphy
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- 31 other—describe below

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The Geochemistry of Radionuclide Migration/Retardation

⑤ OF THE AUTHORS ON THIS PAPER.

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⑥ SPEAKER'S IDENTITY AND CONTACT ADDRESS:

Speaker's name: Ellen J. Quinn
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