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JUL 31 1985

WM Record File wm-ees B0290 oenl
WM Project 10,11,16
Docket No.
PDR ✓
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Ms. Susan K. Whatley
Oak Ridge National Laboratory
P.O. Box X
Chemical Technology Division
Building 4500N, MS 211
Oak Ridge, TN 37831

Dear Ms. Whatley:

SUBJECT: REVIEW OF JUNE MONTHLY PROGRESS REPORT FOR B0290, "LABORATORY EVALUATION OF DOE RADIONUCLIDE SOLUBILITY DATA AND SELECTED RETARDATION PARAMETERS, EXPERIMENTAL STRATEGIES, LABORATORY TECHNIQUES AND PROCEDURES"

I have reviewed the June, 1985 Monthly Progress Report dated July 15, 1985 for the subject contract. Based on my review, progress to date is satisfactory.

On July 25, 1985, I discussed some aspects of current experiments with Bill Arnold. He answered some of the questions I had concerning the neptunium and the uranium studies. Subsequently, I have come up with a few more concerns.

The discovery that the neptunium studies are complicated by the presence of protactinium raises a question--if the analytical techniques normally used are not sensitive enough to differentiate between these two radiostopes, might there be other radionuclides which exhibit similar characteristics? By relying on counting techniques alone, could the DOE be reporting erroreous sorption ratios for certain radionuclides? The neptunium/protactinium complication highlights one of the major weaknesses of batch experiments--the inability to differentiate multiple species.

Several people from the NRC questioned the significance of the negative sorption ratios in the uranium studies. Inasmuch as the uranium concentration of the solution in contact with basalt is greater than that in the control, it appears that basalt may inhibit the precipitation of a uranium solid (Na-boltwoodite). Also, it is apparent from the uranium loss in the control that the spike/GR2 is unstable. Therefore, this solution should not be considered site specific. As a result, should alternative methods of sample preparation be considered?

In the draft of the October-December 1984 Quarterly the apparent concentration limit of Na-boltwoodite is reported as 7.5×10^{-6} mol/L. Presently, more careful oxygen removal techniques are being used. Did you expect to see an increase in the apparent concentration limit under these new conditions? Three

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of the four tests in Table 1 of the Monthly Progress Report exceed the apparent concentration limit previously reported.

The action taken by this letter is considered to be within the scope of the current contract FIN B-0290. No change to cost or delivery of contract products is authorized. Please notify me immediately if you believe this letter would result in changes to costs or delivery of contract products.

Sincerely,

John W. Bradbury
Geochemistry Section
Geotechnical Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

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