



Department of Energy  
 Richland Operations Office  
 P.O. Box 550  
 Richland, Washington 99352

JAN 18 1983

Dr. Robert J. Wright  
 Senior Technical Advisor  
 High Level Waste Technical  
 Development Branch  
 Division of Waste Management  
 U. S. Nuclear Regulatory Commission  
 Washington, DC 20555

Dear Dr. Wright:

**NRC REQUEST FOR CLARIFICATION OF BWIP SCR (SCR-3)**

As requested by your letter of December 14, 1982, and discussed by telephone on January 4, 1983, with you, P. Justus, D. Brooks, J. Starnes, and R. Cook, NRC; J. LaRue, P. Salter, K. Kim and C. Shepard, Rockwell Basalt Project; and D. Squires of my staff, the following response is provided in answer to the questions presented.

Question

Was a two-step pre-equilibration process used in high temperature Kd measurement, i.e., was the tracer pre-equilibrated at high temperature (150° or 300°C) in the absence of basalt with a groundwater solution that had previously been pre-equilibrated with basalt at high temperature?

Response

A two-step pre-equilibration process is not used in the high temperature Kd measurement. The tracer is pre-equilibrated with the groundwater at 25°C before the basalt is added to the system. After addition of the basalt, the system is brought up to T and P. A pre-equilibration of the groundwater with basalt at high temperature is not appropriate since the system would have to be brought down to ambient T and P to add the tracer. The quenched groundwater will not have the same composition as the high temperature groundwater due to precipitation of silica and other components from solution as the temperature is dropped. Steady-state is reached fairly rapidly in these high temperature systems, so an at temperature pre-equilibration is not considered necessary. Ref. Ch. 6 - Section 6.4.2.

WM-10

WM Record File .. 101.2	
WM Dir. ....	
WM Dep. Dir. ....	
WMPI .....	WMML .....
WMHT. RW. ....	WMHL .....
WMUR.....	Others.....

rec'd 1-25-83  
 nb

WM Record File	WM Project
101.2	WM-10
Docket No.	
PDR	<input checked="" type="checkbox"/>
LPDR	<input checked="" type="checkbox"/>
Distribution:	
(Return to WM, 623-SS)	

Question

Was an aliquot of the twice pre-equilibrated tracer used as a blank? Was another aliquot of this solution added to the basalt for a Kd determination? Similarly, was the tracer pre-equilibrated at low Eh with a groundwater solution that had previously been equilibrated with basalt in the presence of hydrozine? Ref. SCR 6.4, pp. 8, 9, 10, and 11.

Response

A two-step pre-equilibration is not used at low temperature either. The tracer is pre-equilibrated with the groundwater at temperature. The equilibrated tracers groundwater is then added to the basalt, also at temperature and the system is allowed to equilibrate for 30-60 days. An aliquot of the equilibrated tracers groundwater is used as a blank. In the low Eh experiments, the tracer is pre-equilibrated in groundwater that has had hydrozine added before contacting the basalt. The groundwater composition is close to the steady-state groundwater composition at ambient repository temperature and a pre-equilibration of the groundwater with the basalt is not deemed necessary. Only the tracer is pre-equilibrated with the groundwater.

If you have any questions on the above material, please call D. J. Squires of my staff.



O. L. Olson, Project Manager  
Basalt Waste Isolation Project Office

BWI:DJS

cc: R. Stein, DOE/HQ