ROTATIONAL ASSIGNMENT CONTRACT

PARTICIPANT INFORMATION:

Allen H. Fetter
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U.S. Nuclear Regulatory Commission
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ASSIGNMENT LOCATION:

Center for Nuclear Waste Regulatory Analyses
Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78228-0510

HOST SUPERVISOR:

Gordon Wittmeyer
CNWRA
6220 Culebra Road
San Antonio, TX 78228-0510

ASSIGNMENT PERIOD:

October 30, 2005 to November 17, 2005

OVERVIEW OF PLANNED ACTIVITIES:

The primary activities of this rotational assignment will be to 1) collaborate with CNWRA staff on flow and transport modeling; 2) discuss potential proactive colloids work with both Center and NRC staff; 3) participate in the NRC-CNWRA Mega-Team Meeting; 4) attend the annual CNWRA review.

NMSS COMMITMENTS:
Not Applicable.

TRAINING:
Not Applicable.

ASSESSMENT OF POTENTIAL FISCAL AND PROGRAMMATIC IMPACTS FROM THE EXCHANGE:

The cost of the exchange is estimated to be around $3700. There are no expected programmatic impacts of this exchange.

DETAILS OF PROGRAM PLAN:

The work performed during this staff exchange will focus on flow and transport modeling in the saturated zone, and examine the effects of contaminant decay and dispersion during flow. The secondary goal of the exchange is the discussion of potential proactive colloids work in the coming year, and address uncertainties regarding the formation, stability and transport of colloids. This will involve interacting with the cognizant Center staff and members of the Integrated Subissue (ISI) Teams who are potentially affected by the colloid issue. Dr. Fetter will

work closely with Dr. Gordon Wittmeyer to coordinate the various technical and team building activities related to the objectives of this rotation.

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Purpose

1. This rotation to the CNWRA will enhance collaboration on flow and transport modeling and improve the realism of contaminant transport simulations.
2. The discussions of proactive colloid work for this and the coming fiscal year will help focus on new approaches for understanding the formation, stability and transport of colloids.
3. The CNWRA letter entitled "Discussion Between CNWRA Staff and King Stablein 11/19/98" discusses the desire of the CNWRA staff to interact technically with NRC staff members for two or more weeks.

CNWRA Mentor

Gordon Wittmeyer

Objectives of Assignment

1. Perform flow and transport modeling using GMS with MT3D to evaluate the effects of chemical dispersion on contaminant flow paths and the size of the potential contaminant plume.
2. Discuss and formulate plans for proactive colloid work in FY06 and FY07, as well as possible experiments for long-term performance confirmation.
3. Assess the potential cross-over technical topics between preclosure and postclosure ISIs with the NRC preclosure team and CNWRA counterparts during the November 1-3, 2005 MegaMeeting.

Anticipated Activities

1. Work with David Farrell and other Center staff on learning and running the GMS and MT3D modeling codes. We will consider the effects of dispersion for more realistic transport simulations and the potential to affect the contaminant plume dimensions.
2. Meet with CNWRA and NRC staff to discuss proactive technical work related to colloids.
3. Participate in the preclosure Mega-Meeting, looking specifically proposed interim staff guidance, YMRP enhancement, and cross-over technical topics between preclosure and postclosure teams. .
4. Evaluate and interpret the results of the flow and transport modeling runs.

Anticipated Products

1. A better understanding of the GMS modeling code and more realistic simulations of solute transport using the MT3D model.
2. A plan for proactive work addressing the formation, stability and transport of colloids.
3. Enhanced communication and integration between NRC and CNWRA staff across ISI teams affected by the colloid issue.
4. Presentations of results at future professional society conferences and Yucca Mountain Team Meetings.

Statement of Professional Qualifications

Allen H. Fetter

The United States Nuclear Regulatory Commission
Office of Nuclear Materials Safety and Safeguards

Dr. Fetter is a Hydrologist in the Repository Site Section of the Division of High-Level Waste Repository Safety. Currently, he serves as Lead Author and Project Officer for the Integrated Subissue (ISI) SZ1 (Flow Paths in the Saturated Zone).

Dr. Fetter received his Bachelor's degree in Geology from Guilford College in Greensboro, North Carolina, after which he worked for three years as a geologist/project manager for the environmental consulting firm BPA Environmental and Engineering, Inc.

Dr. Fetter then received his M.S. in Geology from the University of North Carolina - Chapel Hill, and his Ph.D. in Geology from the University of Kansas in Lawrence. Both his master's and doctoral research involved utilizing isotope geochemistry and geochronology to study crustal growth processes, and constrain the timing of tectonic events during major continental assemblies. Nonetheless, during his graduate studies, he also took courses in hydrology and aqueous geochemistry to supplement his previous professional work experience. His masters research focused on the Precambrian and Paleozoic tectonic evolution of the southern Appalachians, and his doctoral studies concentrated on reconstructing the assembly history of northeast Brazil during the amalgamation of the West Gondwana supercontinent. During his Ph.D., he also engaged in collaborative research with geoscientists on projects in Africa, Antarctica, the southern Appalachians and the Rocky Mountains.

Prior to joining the U.S. NRC, Dr. Fetter worked as a postdoctoral researcher at São Paulo State University - Rio Claro in Brazil, where he set up and managed an isotopic geochemistry and geochronology laboratory. His research involved collaborative research with geoscientists from several other Brazilian universities, with the objective obtaining precise age constraints on the structural development of two Precambrian orogenic belts along the southern margin of the São Francisco craton in southeast Brazil. In addition to his own research, Dr. Fetter assisted four graduate students with their research projects, served as a committee member in three doctoral and two master's defenses, and taught several graduate level seminars.

Dr. Fetter has twenty publications in peer review journals and has given talks at six national and international professional conferences.