



**GEOSCIENCES AND ENGINEERING DIVISION  
QUALITY ASSURANCE  
SURVEILLANCE REPORT**

PROJECT NO.: 06002.01.212,  
214, 222, 232, 242

REPORT No.: 2006-12

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SURVEILLANCE SCOPE: CNWRA Geochemistry (GC) activities:

- Quality and Chemistry of Water Contacting Engineered Barriers and Waste Packages (QC)
- Radionuclide Release Rates and Solubility Limits (RR)
- Radionuclide Transport in the Unsaturated Zone (RTUZ)
- Radionuclide Transport in the Saturated Zone (RTSZ)

REFERENCE DOCUMENTS:

QAPs-001, 004, 007, 013, 014, 019; TOPs-012, 018; AP-013

START DATE:  
06/08/06

END DATE  
06/19/06

QA REPRESENTATIVE:  
M. Simpson, B. Brient

PERSONS CONDUCTING ACTIVITY:

E. Percy (GC Mgr)

QC - J. Myers (PI), M. Juckett, B. Pabalan, S. Agarwal\*, P. Shukla\*, L. Sabido

RR - D. Pickett (PI), K. Smart, X. He, D. Sarkar, K. Markis, P. Bertetti

RTUZ - J. McMurry (PI)

RTSZ - P. Bertetti (PI), M. Roberts, S. Watson\*, V. Cvetkovic\*, S. Painter, D. Pickett

\* Not interviewed; reviewed qualification, training, and conflict of interest (COI) records only.

SATISFACTORY FINDINGS:

General Observations:

Discussions were held with the GC Manager, Principal Investigators (PIs), and associated staff, consultants, and students to identify current work activities and the implementation of applicable QA program and other Division requirements. The following programmatic elements were assessed: work planning in Quality Requirements Application Matrices (QRAMs), scientific notebooks, software control, control of measuring and test equipment (M&TE), chemical and sample control, personnel qualification, training, and conflict of interest (COI) records, and remote-location trip preparation. No recent deliverables or review documentation were evaluated.

QRAMs have been completed for current Geochemistry work.

Scientific notebooks appear to be generally comprehensive, up-to-date, well maintained, readily available, and reasonably secure. Notebooks include appropriate initial and in-process entries and acknowledgments, software, laboratory, and field-work control references. A couple of isolated and minor corrections were made during the surveillance (see RR below). Various quality improvement practices were suggested. One formal Recommendation is described below.

Software references and controls appear to be complete and up to date. Quality improvement was suggested in RR (see below).

Control of M&TE, samples, and chemicals is satisfactory overall.

Personnel qualification, training, and COI records are up-to-date for listed staff.

Preparations for the RR trip to Nopal I appear to be in compliance with AP-013 requirements.

All contacted personnel were available as scheduled and were cooperative and helpful.

#### QC:

A new PI has been assigned since initial QRAM completion. Salt Deliquescence lab work and modeling activities were addressed. Lab notebook 596 was reviewed. The expected modeling notebook had not yet been initiated but compiled notes intended for possible inclusion in the notebook were reviewed (see "Recommendation" below). Software programs TOUGHREACT-3.0 and StreamAnalyzer-2.0 are in use. TOUGHREACT is a new addition to this activity and is not listed on the QRAM. It is currently undergoing validation and no currently planned deliverables will utilize it. Documentation of dust samples received from USGS was being maintained in an informal location (e-mail). It was suggested and agreed to record the receipt of these samples directly in the notebook or by reference to a sample custody log.

Thermal Hydrology and Chemistry (THC) modeling notebooks 780, 797, and 762 were reviewed. This activity is just getting started and the assigned consultant is training on the software.

Stress Corrosion Cracking (SCC) lab work and modeling were considered for review but no significant documentation yet exists and cognizant staff were not easily available for interview.

Programmatic work with D. Brooks (NRC) on LA strategy for QC work and the review of DOE's Nopal I documentation were also considered but not included in this surveillance because no procedural compliance is required and no deliverables are planned.

#### RR:

Natural Analog Studies (Nopal I) were addressed. Preparations for the upcoming trip to a remote site (Nopal I) were discussed. Staff will observe DOE work and possibly take samples. Field notebooks 121 and 793 and the Work/Safety Plan were reviewed. ARCGIS software will be used for mapping and is being used for a re-analysis of fracture data collected last year.

In-Package Chemistry lab and modeling activities were addressed. Notebooks 172, 133, 706, 791, 783, and 767E were reviewed. Two of the PI's notebooks (not activity-specific) have been open a long time (ten years). A suggestion was made and accepted to submit these notebooks at the earliest convenient time. It was noticed in a lab notebook that prior thermometer and balance calibration dates appeared to have been performed after the date of their corresponding notebook entries. Upon immediate investigation by the cognizant staff member, these were determined to be minor and isolated data entry errors (caused by the subsequent addition of an external form into an otherwise already complete and dated notebook page). Corrections to the notebook were promptly made during the surveillance. The M&TE in question had been correctly calibrated and associated records were in order. Also, a more easily traceable notebook reference to a unique identification for "pore water" was suggested and agreed to by the staff member. Software program GWB version 6 is in use by consultants Sarkar and Markis. Version 6 is not yet under GED control. This is allowable under TOP-018 but is not a best practice in this situation. The PI has been reminded that software validation needs to be completed prior to submittal of a deliverable. GED management has recently been reminded of the need to assure correct versions of software are being used by non-GED personnel.

#### RTUZ:

This activity consists of information gathering and literature review concerning DOE's position on matrix flow. No documentation is currently available for review (or needed). Depending on the results of this

review, a formal study may be initiated in the future, utilizing either existing or newly-gathered data. A consultant has been employed in the past but is not currently assigned.

RTSZ:

Neptunium Sorption in Alluvium lab activities were addressed. Notebooks 742 and 800 were reviewed. While not specifically a sample control issue, it was noted that recent experiments from two consolidated borehole samples will be reworked because of sample handling errors. The PI is initiating an NCR. This situation is noted as a satisfactory finding because the problem was appropriately discovered during normal work review practices and is being correctly dispositioned by the PI. It was also suggested and agreed that notebooks corresponding to this situation contain more specific cross-reference to the planned rework.

Formation and Transport of Colloids into the Saturated Zone; modeling, calculations, and literature activities were addressed. No current work is being performed. The consultant utilized in the past may be reactivated as budget allows. Notebook 318E was reviewed.

UNSATISFACTORY FINDINGS:

None

NCR NO.: NA

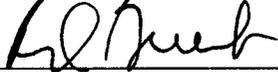
CAR NO.: NA

ATTACHMENTS: None

RECOMMENDATIONS/ACTIONS:

In at least one instance (QC), a notebook is being compiled from selected notes just prior to each normal six-month notebook copying schedule rather than as an ongoing exercise. This method is intended to present a cleaner, clearer, more straight-forward presentation of work by eliminating collected material determined by the presenter to be superfluous or unnecessary to the documentation of necessary evidence. However, this is not the traditionally accepted method for notebook development. While QA personnel performing this surveillance have tentatively concluded that this notebook preparation method seems logical and does not directly contradict procedural requirements, the situation is identified here for management consideration. If this practice is determined to be technically acceptable, it is suggested that QAP-001 be revised to specifically allow for this method; with the stipulation that material collected prior to notebook insertion be controlled in the same manner as the notebook itself. This is the current defacto situation but it is not identified as an option in the procedure.

APPROVED:



DATE:



DISTRIBUTION:

ORIGINAL—QA RECORDS

DIRECTOR, QA

ASSISTANT DIRECTOR - G. Wittmeyer

MANAGER - E. Percy

PRINCIPAL INVESTIGATORS - D. Pickett, J. Myers, P. Bertetti, J. McMurry