



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

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|-----------------------------------|--------------------|-----------------|
| PROJECT<br>NO.: 20.06002.252-.282 | REPORT No.:2006-07 | Page _1_ of _3_ |
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SURVEILLANCE SCOPE: Hydrology Activities

REFERENCE DOCUMENTS: AP-001, Evaluation of Potential for Conflict of Interest, QAP-001, Scientific Notebook Control; ; QAP-004, Surveillance Control; QAP-005, Quality Indoctrination and Training; QAP-007, Professional Personnel Qualification; and QAP-013, Quality Planning; and QAP-019, control of Measuring and Test Equipment.

|                      |                                    |   |
|----------------------|------------------------------------|---|
| START DATE: 03/13/06 | END DATE 03/14/06<br>30 APR 4/5/06 | QA REPRESENTATIVE:<br>Mark R. Ehnstrom <i>MRE</i> |
|----------------------|------------------------------------|---|

PERSONS CONDUCTING ACTIVITY: G. Wittmeyer, S. Stothoff , C. Manepally, S. Painter, D. Farrell, A. Sun, C. Dinwiddie, R. Green, M. Necsoiu, S. Colton, D. Waiting, R. McGinnis, D. Bannon, and M. Musgrove

**SATISFACTORY FINDINGS:** Quality Requirements Application Matrices were developed for the four Integrated Subissues managed by Hydrology and appeared to be complete and accurate. The Professional Personnel Qualification files for the following staff members and consultants were reviewed for completeness and accuracy and were found to be satisfactory: G. Wittmeyer, S. Stothoff , C. Manepally, S. Painter, D. Farrell, A. Sun, C. Dinwiddie, R. Green, M. Necsoiu, S. Colton, D. Waiting, R. McGinnis, D. Bannon, David Woolhiser, S. Sandberg, R. Smith, and Kelly Bradbury. The qualification file for consultant Dani Or is currently being processed.

The calibration documentation for critical measuring and test equipment was located in the Electronic Library Facility. See Attachment A for a listing of the equipment reviewed.

#### **Climate and Infiltration**

Work has commenced on evaluating the NRC rule on deep percolation. Literature searches on climate data in the Yucca Mountain region were performed by two staff members. The results of one search will be documented in Scientific Notebook 741 and the other search is documented in a summary report. Test results for precipitation and infiltration were compared to USGS results obtained on 11 different basins with satisfactory results.

A FieldSpec 3 field spectral radiometer was recently purchased and will be used for reflectance measurements of rocks, soils, and vegetation. These measurements will be used to create land cover maps of the infiltration area. Calibration check discs, traceable to the National Institute of Standards and Technology, were included in the purchase to provide the ability to perform a calibration of the system prior to use.

#### **Flowpaths in the Unsaturated Zone**

Work continues on ambient flow and thermal pulse characteristics. The 20% Drift Scale experiment will be starting again to obtain additional data. Measuring and test equipment for this experiment was reviewed (Attachment A) and was determined to be acceptable. A second experiment evaluating the effects of flow in rubble will begin in the near future.

Analysis is being performed on Bishop Tuff Permeability Data. The data being analyzed was compiled earlier by CNWRA staff. Kelly Bradbury is a qualified consultant on this work. Data used for the analysis are contained in Scientific Notebooks 526 and 639.

#### **Flowpaths in the Saturated Zone**

Alluvium zone model uncertainty is being reduced by assimilating hydraulic data. Software to aid in performing these activities include MATLAB V 7.0.1 (exempt from TOP-018) and GMS 5.1 (controlled and validated).

Review of the QA software records found only a package for GMS 5.0. However, version 5.1 had actually been controlled and validated. The inconsistencies are from the vendor's practice of keeping old (i.e., 5.0) file names even when the code is revised. The software release notice and all other references to version 5.0 were corrected.

SATISFACTORY FINDINGS (Continued):

A limited amount of work has begun on the development of a validation test plan for ArcView V 3.3 to incorporate spatial analysis based on additional grid information. An additional activity is utilizing EarthVision 7.5 as a visualization tool to construct the hydro geologic framework. These activities, including the evaluation for possible use of Arc/Info V 8.0.2, should be well underway during the next scheduled surveillance.

**Concentration of Radionuclides in Groundwater**

Activity concentrated in evaluating geophysical data to support the hydraulic conductivity work in the alluvium zone is being performed by A. Sun. Software used in these analyses included Surfer V 8.0 and Earth Vision V 7.5. Both Surfer V8.0 and Earth Vision V 7.5 have been placed under control and validated. The validation test for MT3DMS V 4.5 was completed in October 2005 and the software files are maintained in the QA records room.

UNSATISFACTORY FINDINGS: None

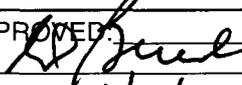
NCR NO.:N/A

CAR NO.: N/A

ATTACHMENTS: Attachment A containing additional information.

RECOMMENDATIONS/ACTIONS: None

APPROVED:



DATE:

4/4/2006

DISTRIBUTION:

ORIGINAL—QA RECORDS

DIRECTOR: G. Wittmeyer

MANAGER: N/A

PRINCIPAL INVESTIGATORS

## Measuring and Test Equipment reviewed during the surveillance:

| Item                           | Serial No.  | Cal. Date | Cal Due Date |
|--------------------------------|-------------|-----------|--------------|
| Hewlett Packard Switch Unit    | US37011843  | 12/27/05  | 12/27/06     |
| Agilent Switch Unit            | MY44010920  | 1 /27/06  | 1 /26/06     |
| Fluke Data Logger              | 5832650     | 12/9/05   | 6/9/06       |
| Power Transducers              | 03080276-79 | 9/26/05   | 9/26/06      |
| Parascientific Gauge           | 60999       | 10/6/06   | 4/6/06       |
| Humidity and Temp. Transmitter | W1840037    | 12/30/05  | 12/29/06     |