OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION

QUALITY ASSURANCE SURVEILLANCE REPORT OF

U.S. GEOLOGICAL SURVEY

SURVEILLANCE NO. YMP-SR-92-022

CONDUCTED AUGUST 10 THROUGH 12, 1992

ACTIVITIES SURVEILLED:

CONTROL OF MEASURING AND TEST EQUIPMENT

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ENCLOSURE

1.0 EXECUTIVE SUMMARY

This surveillance was performed to evaluate the U.S. Geological Survey (USGS) Quality Assurance (QA) Program Element 12.0, Control of Measuring and Test Equipment (M&TE) as a follow-up to Audit No. YMP-92-20. The surveillance was conducted at the USGS facilities in Las Vegas, Nevada and the Nevada Test Site (NTS) from August 10 through 12, 1992, by a member of the Yucca Mountain Quality Assurance Division (YMQAD) of the Office of Quality Assurance (OQA) in accordance with Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Administrative Procedure QAAP 18.3, Revision 3.

One Corrective Action Request (CAR) regarding the errors in the calibration tracking register was generated as a result of this surveillance. There were five deficient conditions identified and corrected during the surveillance: 1) no signature and date on two computer generated calibration data records, 2) incorrect identification number (one letter missing) of a pygmy current meter on a calibration record, 3) wrong calibration sticker on a pyranometer, 4) incorrect identification (one number missing) of a seismic telemetry station, and 5) wrong calibration dates of two wind speed sensors on the calibration register.

Except for the above deficient conditions, USGS is satisfactorily implementing an effective M&TE program.

2.0 PURPOSE AND SCOPE

The purpose of this surveillance was to perform an evaluation of QA Program Element 12.0, Control of Measuring and Test Equipment, as a follow-up to Audit No. YMP-92-20. During this audit, it was felt that full effectiveness of QA Program Element 12.0 could not be determined due to the limited amount of M&TE available at USGS in Denver, Colorado. As a result, this surveillance was conducted to further evaluate the effectiveness and control of M&TE utilized by USGS in Las Vegas, Mercury, and remote locations of the NTS.

YMP-USGS-QMP-12.01, Revision 5, Modification No. 2, "Instrument Calibration," is the USGS procedure for implementing QA Program Element 12.0.

3.0 SURVEILLANCE TEAM

Amelia I. Arceo, Surveillance Team Leader, QA Engineer, Science Applications International Corporation (SAIC)/YMQAD, Las Vegas, Nevada

4.0 PERSONNEL CONTACTED DURING THE SURVEILLANCE

David H. Appel, USGS, Hydrologic Investigations Program (HIP) Chief,
James R. Brooks, USGS, Technician
Michelle Boucher, USGS, QA Specialist
Terry L. Campbell, USGS/Foothills, Hydrologic Technician
Patricia M. Cooley, USGS, Water Resources Division (WRD), Hydrologic Technician
William J. Davies, USGS, Hydrologist
Thomas G. Kane, USGS, WRD Supervisor Hydro/Tech Principal Investigator
Clair Martinez, USGS, WRD Physical Scientific Aid
Tracy M. Mendez-Vigo, USGS/SAIC, QA Specialist
Marilyn E. Pabst, USGS, HIP QA Specialist
Patricia G. Reilly, USGS/SAIC, QA Specialist
Wayne Rodman, USGS, QA Specialist
Daniel J. Soeder, USGS, Hydrologist
Rafael Valentin, USGS/Foothills, Hydrologic Technician
James Ziemba, USGS/SAIC, Audit Supervisor

5.0 SURVEILLANCE RESULTS

5.1 The implementing procedure Yucca Mountain Site Characterization Project (YMP) USGS Quality Management Procedure (QMP)-12.01, Revision 5, Modification 2, "Instrument Calibration," was the source of checklist questions used to conduct this surveillance.

Documentation reviews, procedure reviews, personnel interviews and direct observation of instruments being calibrated were performed. Two hydrologic monitoring stations (B1 and H1) using pressure transducers, one manometer streamflow gaging station, two weather data gathering stations, and two seismic monitoring stations (CDH-1 and YMT-5) were observed in the field. Other instruments were checked in the laboratory. See Attachment 1 for identification of instruments observed.

A. Field observations were performed to verify procedural compliance of the following attributes:

- Equipment uniquely identified with model number, serial number or other unique identifier.

- Calibration status sticker affixed.

- Required information on calibration sticker (i.e., identification, date calibrated, recalibration due date, procedure used for calibration, and calibrator).

- Condition and overall protection of sensitive instrumentation from the elements, where required, and operating status of instrumentation when visual observation could be achieved (i.e., some instrumentation subsurface {transducers} except for wiring).

Two deficiencies were identified in this area. Both were corrected during the surveillance. See Section 5.3, Items 1 and 2.

B. Personnel interviews consisted of questioning individuals responsible for the control of instruments and calibrations performed by USGS. These interviews were conducted to ascertain individual's overall cognizance of procedural requirements. The results of these interviews provided positive evidence of an overall working knowledge and understanding of not only USGS-QMP-12.01, but also of the technical procedures used to perform calibrations.

C. Documentation reviews consisted of detailed examination of calibration documentation supplied by vendors and documentation used for recording calibrations performed by USGS personnel. Documentation was reviewed for but not limited to the following:

- National Institute of Standards and Technology traceability information, or similar information when using recognized standards

- Other required information: i.e., organization, individual item's unique identification number, standard's range and accuracy, date of calibration and due date for next calibration, name and signature of person performing calibration, Technical Procedure (TP) used for calibration, data showing indicated values versus standards measured values and calculations to determine if equipment is within required tolerance or accuracy.

Three deficiencies were identified in this area. They were corrected during the surveillance. See Section 5.3, Items 3, 4 and 5.

D. Documentation reviews also included verifying that the information on the Calibration Record, which is the calibration tracking system, is accurate. CAR-YM-92-063 was generated in this area. See Section 5.2 for the summary of the CAR.

E. Review of TPs was performed. TPs used for calibration of instruments listed on Attachment 1 were verified to include methodology, calibration intervals, range, and accuracy requirements.

F. Review of the Approved Vendors List, dated June 5, 1992, revealed that the vendors that performed calibrations were on the list.

G. There were no calibration instruments that were tagged or segregated since there were no Nonconformance Reports (NCRs) issued against calibration instruments. NCR-92-23 regarding nonconforming calibration certificates from Li-Cor, Inc., did not require hold tags as indicated on the NCR. Interview with the originator's supervisor provided justification for not using hold tags and the current status of the NCR.

5.2 Synopsis of Corrective Action Request

CAR YMP-92-063 identified incorrect calibrators on the Calibration Record of the Geologic Division, NTS. An information copy of the CAR is contained in Attachment 2.

5.3 Deficiencies Corrected During the Surveillance:

1. One instrument (pyranometer) had an incorrect calibration sticker. It was verified that the previous sticker was inadvertently left when the instrument was removed for recalibration by a vendor. This was corrected prior to the end of the surveillance by affixing the correct sticker.

2. One Seismic Telemetry Station was identified as CDH instead of CDH-1. This was also corrected on the spot.

3. The calibration record for Instrument ID 4073, Tipping Bucket Raingage (computer generated calibration data) was not signed and dated. The calibration personnel who failed to sign and date the computer generated calibration data records went back to six the calibrations he performed (as listed on the July 24 Calibration Register) and signed and dated them.

4. Instrument ID WR-A-326, Pygmy Current Meter, was identified as WR-326 on the "Discharge Measurements Notes" for Station No. 10251252. This was corrected by the Principal Investigator.

5. The calibration date on the Calibration Record for Instrument ID's B1408, E1683, Wind Speed Sensors was 7/7/92; however, the calibration records from Sverdrup indicated 4/22/92 and 3/30/92, respectively, as dates when the vendor calibrated the instruments. Further investigations revealed that the hydrologist who filled-in the Attachment 2 of the USGS QMP-12.01, "YMP-USGS Notification of Calibration Status," wrote the date that the instruments were deployed in the field as the calibration date. The Chief of HIP wrote a memorandum to the hydrologist regarding the correct completion of Attachment 2, which the hydrologist signed as having read, understood and investigated all wind speed sensor calibration sheets and corrected the records as needed. These were all completed and verified on August 12, 1992.

6.0 RECOMMENDATION

It was recommended that the Calibration Record or calibration tracking system be revised to include information or notation for initial calibration date, date deployed, operational checks or other similar information to help in the tracking of calibration activities.

ATTACHMENT 1

CALIBRATION INSTRUMENTS CHECKED DURING THE SURVEILLANCE:

ID NUMBER	INSTRUMENT NAME	CALIBRATED BY	TECH PROCEDURE
W-344208	Manometer	Operator (T. Kane*)	HP-45, Rev.2
06308	Thermometer	Sverdrup**	HP-91, Rev. 3
0N813	Thermometer	Sverdrup**	HP-91, Rev. 3
092612	Ph Meter	Operator	HP-91, Rev. 2
8009528	Pygmy Current Meter	Operator	HP-91, Rev.2
WR-A-326	Pygmy Current Meter	Operator (T. Kane)*	HP-166, Rev.0
R02	Surveying Rod	Sverdrup**	HP-45, Rev. 2
21X-3021	DataLogger	Campbell Scientific Inc. (CSI)**	HP-97, Rev. 0
21X-7207	DataLogger	CSI**	HP-97, Rev.1
4073	Tipping Bucket Rain Gage	J. Hevesi*	HP-179, Rev. 1
4896	207 Probe	Sverdrup**	HP-97, Rev. 1
4898	207 Probe	Sverdrup**	HP-97, Rev. 1
B1408	Wind Speed Sensor	Sverdrup**	HP-95, Rev. 0
E1683	Wind Speed Sensor	Sverdrup**	HP-95, Rev. 0
F1175	Wind Direction Sensor	W. Davies*	HP-95, Rev. 0
11923	Pyranometer	Li Cor**	HP-168, Rev. 0
10417	Pyranometer	Li Cor**	HP-168, Rev. 0
10702	Pyranometer	Li Cor**	HP-168, Rev. 0
20396	Barometric Pressure Transducer	Sverdrup**	HP-60, Rev. 1
22352	Barometer	YSI**	HP-60, Rev. 2
DCP-00974	Trans-DCP	Valentine/	HP-60, Rev. 2
PXDR-274148	System B-1	Campbell*	HP-71, Rev. 0
DCP-00974	Trans-DCP	Valentine/	HP-60, Rev. 2
PXDR-417336	System B-1	Campbell*	HP-71, Rev. 0
DCP-00975	Trans-DCP	Valentine/	HP-60, Rev. 2
PXDR-448969	System H-1	Baldwin/	HP-71, Rev. 0
DCP-00975	Trans-DCP	Valentine/	HP-60, Rev. 2
PXDR-255373	System H-1	Baldwin/	HP-71, Rev. 0
DCP-00975	Trans-DCP	Valentine/	HP-60, Rev. 2
PXDR-2656DJ	System H-1	Campbell*	HP-71, Rev. 0
DCP-00975	Trans-DCP	Baldwin/	HP-60, Rev. 2
PXDR-41604	System H-1	Campbell	HP-71, Rev. 0

* Logbook or data sheet entries by USGS personnel were verified
** Calibration Record from vendors were verified

TECHNICAL PROCEDURES REVIEWED FOR CALIBRATION REQUIREMENTS

DOCUMENT #	EFFECTIVE DATE	TITLE
HP-45, R2	10/30/91	Method of Installation, Operation, and Examination of a Recording Streamflow Gage Using the Bubble-Gage STACOM Manometer System
HP-60,R1	02/12/90	Method for Monitoring Water-Level Changes Using Pressure Transducers
HP-71,R0	09/01/87	Method for Monitoring Water-Level Changes Using a Campbell Scientific 21X Micrologger
HP-95,R0	08/14/89	Measurement of Wind Direction Using a Met-1 Model 024A Wind Direction Sensor
HP-97,R1	03/15/91	Measurement of Temperature and Relative Humidity Using a CSI 207 Temperature and Relative Humidity Probe
HP-166,R0	05/18/88	Stream Discharge Measurements Using a Pygmy Meter
HP-168,R0	06/09/88	Measurement of Energy Flux Density by a Pyranometer
HP-179, R1	09/09/91	Field Measurement of Precipitation Using a Tipping Bucket Rain Gage

MISCELLANEOUS:

YMP-USGS Approved Vendor List, dated 6/5/92
Nonconformance Report USGS-NCR-92-23, dated 5/11/92
Status of Open Items - USGS Nonconformance Reports (NCRs), dated 7/29/92

ATTACHMENT 2

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

8 CAR NO.: YM-92-063
DATE: 8/17/92
SHEET: 1 OF 1
QA

CORRECTIVE ACTION REQUEST

1 Controlling Document YMP-USGS-QMP-12-01, Revision 5, Modification 2	2 Related Report No. YMP-SR-92-022
3 Responsible Organization USGS	4 Discussed With W. Rodman/J. Brooks/T. Mendez-Vigo

5 Requirement:

Paragraph 5.4.5 of the above document states, "A calibration tracking system is to be maintained by the QA Office for all equipment calibrations and status. The QA Office provides PIs with a quarterly listing of equipment in the calibration register and its status. Upon receipt, the PIs or delegates, shall review the listing and ensure that the information is correct. If errors are detected during review of the listing the PIs, or delegates, shall correct the errors, sign and date the page, and return it to the YMP-USGS QA Office."

6 Adverse Condition:

Contrary to the above requirement, errors were found on the Calibration Record, Geologic Division, Nevada Test Site, dated July 24, 1992, for the Instrument ID Numbers CDE-1 and YMT-5, Seismic Telemetry Stations. The Calibration Stickers and Log Books at both stations identified J. McConnell as the Calibrator; however, the Calibration Record which is the calibration tracking system, identified J. Brooks/D. Gibbons as the persons who performed the calibrations.

9 Does a significant condition adverse to quality exist? Yes___ No X If Yes, Circle One: A B C	10 Does a stop work condition exist? Yes___ No X ; If Yes - Attach copy of SWO If Yes, Circle One: A B C D	11 Response Due Date: 20 days from issuance

12 Required Actions: [X] Remedial [X] Extent of Deficiency [X] Preclude Recurrence [ ] Root Cause Determination

13 Recommended Actions:

Correct the "Calibrated by" information on the Calibration Record of ID Numbers CDE-1 and YMT-5. Investigate the Calibration Record of Geologic Division for similar problem and provide corrective actions to prevent recurrence.

7 Initiator Amelia I. Arceo A. I. Arceo Date 8/17/92	14 Issuance Approved by: QADD R. E. Spence Date 8/19/92
15 Response Accepted QAR Date	16 Response Accepted QADD Date
17 Amended Response Accepted QAR Date	18 Amended Response Accepted QADD Date
19 Corrective Actions Verified QAR Date	20 Closure Approved by: QADD Date

REV. 08/91