Department of Energy
Washington, DC 20585

MAR 1 1 1997

QA: L

R. W. Craig, Technical Project Officer
for Yucca Mountain Site
Characterization Project
U.S. Geological Survey
1261 Town Center Drive
Building 12 , Room 1249, M/S 423
Las Vegas, NV 89134

ISSUANCE OF SURVEILLANCE YM-SR-97-010 RESULTING FROM THE OFFICE OF QUALITY ASSURANCE (OQA) SURVEILLANCE OF THE U.S. GEOLOGICAL SURVEY (USGS)

Enclosed is the record of Surveillance YM-SR-97-010 conducted by the OQA at the USGS Exploratory Studies Facility (ESF), at the Yucca Mountain Site, Nevada.

The purpose of the surveillance was to assess the implementation of quality controls for moisture studies conducted in the ESF.

Performance Report (PR) YM-97-P-004 was issued as a result of this surveillance.

This surveillance is considered completed and closed as of the date of this letter. A response to this surveillance record and any documented recommendation is not required; however, the open PR transmitted separately will continue to be tracked until it is closed to the satisfaction of the Quality Assurance Representative and the Director, OQA.

If you have any questions, please contact either James Blaylock at (702) 794-1420 or John R. Doyle at (702) 794-1465.

James Blaylock for
Donald G. Horton, Director
Office of Quality Assurance

OQA:JB-1150

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Enclosure:
Surveillance Record YM-SR-97-010

WM-11
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MAR 1 1 1997

cc w/encl:
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OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

Surveillance No. YM-SR- 97-010

QUALITY ASSURANCE SURVEILLANCE RECORD

SURVEILLANCE DATA

1. ORGANIZATION/LOCATION:	2. SUBJECT:	3. DATE:
U.S. Geological Survey (USGS), Yucca Mountain Site, Nevada	Moisture Studies in the Exploratory Studies Facility (ESF)	January 23 through February 10, 1997

4. SURVEILLANCE OBJECTIVE:

5. SURVEILLANCE SCOPE:

To assess the implementation of quality controls for Moisture Studies conducted in the ESF.

6. SURVEILLANCE TEAM:
Team Leader:

John R. Doyle

Additional Team Members:

N/A

7. PREPARED BY:		8. CONCURRENCE:	
John R. Doyle 2/26/97		James Blaylock for DGH	3/11/97
Surveillance Team Leader	Date	QA Division Director	Date

SURVEILLANCE RESULTS

9. BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

On January 23 through February 10, 1997, a surveillance was performed at the ESF at the Yucca Mountain Site, Nevada, to evaluate the effectiveness of quality assurance controls in the implementation of Field Work Package (FWP No.) ESF-96-004, "Moisture Studies in the Exploratory Studies Facility," and USGS Hydrologic Procedures (HP) HP-96, "Measurement of Wind Speed using a MET-ONE Inc. Model 014A Wind Speed Sensor," and (HP) HP-97, "Measurement of Temperature and Relative Humidity Using a Temperature and Relative Humidity Probe."

(See pages 2-6 continued)

10. SURVEILLANCE CONCLUSIONS:

Based on documentation reviews and personnel interviews, it has been determined that, except for the issuance of one Performance Report, the overall adequacy and effectiveness of Moisture Studies in the ESF is adequate and effective.

(See page 7 continued)

11. COMPLETED BY:		12. APPROVED BY:	
John R. Doyle 3/5/97		James Blaylock for DGH	3/11/97
Surveillance Team Leader	Date	QA Division Director	Date

Block 9 (continued) BASIS OF EVALUATIONS/DESCRIPTION OF OBSERVATIONS:

Moisture Studies in the ESF consists of several different tests consisting of air flow velocity, temperature, relative humidity and barometric pressure measurements. These tests will determine the moisture conditions of the tunnel and excavated rock providing hydrologic-parameter input for the resolution of design and performance issues.

There are five temperature and relative humidity stations located in the ESF (for locations see equipment reviewed during the course of the surveillance). Campbell Scientific Inc. (CSI) Temperature and Relative Humidity Probes (T&RH Probe) are utilized to collect temperature and relative humidity measurements at these stations. Air flow velocity measurements utilize a MET-ONE Inc. Model 014A Wind Speed Sensor. Readings from these measurement devices are compiled using a calibrated CSI C5121X Data Logger (21X). Data is down-loaded bi-weekly into a Campbell Model 192 Storage Module. Modules are taken to the Hydrologic Research Facility (HRF), down-loaded into a personal computer, compiled, verified, and then duplicated in hard copy and magnetic formats. As of the surveillance, the first Data Package for data collected from November 1996 to January 1997, was being compiled for submission to the Technical Information Database. This package is scheduled to be delivered for an internal technical review in mid-March 1997.

During the course of the surveillance, it was verified that the suppliers responsible for calibrations for the above Measuring and Test Equipment (M&TE) were listed on Qualified Suppliers List (QSL) as of January 28, 1997. It was noted during review of the QSL that CSI was restricted from providing calibration services to the USGS until an acceptable response was received to Deficiency Report (DR) YM-96-D-035. YM-96-D-035 identifies that CSI had not translatted all of the requirements from their QA manual into their implementing procedures, nor were those procedures issued for use at the time of the survey. A review of the Supplier Evaluation Reports (SERs) for CSI dated March 28, 1996, revealed that this restriction was imposed on April 8, 1996. An examination of calibration stickers on instruments located in the ESF revealed that no calibrations were performed during the time frame of April 8, 1996 through May 3, 1996, when an acceptable response was received.

The following selected attributes of the above referenced Technical Procedures were reviewed:

HP-96 "Measurement of Wind Speed using a MET-ONE Inc. Model 014A Wind Speed Sensor"

Paragraphs 4.2.1 and 4.2.2 state:

> *4.2.1 The installation of the Met-One Inc. Model 014A wind speed sensor will be explained in the investigators field notebook for each data collection operation.*

Section 4.3 describes the primary equipment used with this procedure. (See manufacturer's manual for recommended installation criteria).

4.2.2 The wiring connections required for the Met-One Inc. Model 014A with the Campbell Scientific Inc. Datalogger (models CR7X, CR10, or 21X) shall be described in the investigator's field notebook for each data collection operation. A reference to identical wiring connections previously recorded in the field notebook may be made.

o Verified that the installation of the Model 014A Wind Sensor with Data Logger Model 21X was documented in the Principal Investigator field notebook which is stored at the HRF.

Paragraphs 4.2.3 and 4.2.4 state:

4.2.3 Programming the Campbell Scientific Datalogger (models CR7X, CR10, or 21X) for use with the Met-One Inc. Model 014A wind speed sensor will be maintained as a log (record) on the information stores for each data collection operation. The investigator has the option to provide a program sheet for the CSI datalogger used for each data collection operation. The programming log or programming sheet will be stored in investigator's field notebook or in a supplemental notebook to the field notebook. A reference to identical programming of the CSI dataloggers that currently exists in the field or supplemental notebook may be referenced for each data collection operation.

4.2.4 The data contained within the memory of the CSI datalogger is periodically transferred to magnetic tape or other non-volatile storage media either under program or operator control. The data will be recovered by the investigator at intervals sufficiently short to ensure no loss of data. This recovery interval will be determined by the investigator and based upon the logging frequency and number of instruments sampled.

o Verified that programming sheets for the CSI Data Logger Model 21X are located in the Principal Investigator's field notebook, and that data is transferred on a bi-weekly basis to magnetic tape. Data is down-loaded to floppy disks and personal computer hard drive. A hard copy is also maintained at the HRF.

Paragraph 5.0 states:

5.0 *CALIBRATION REQUIREMENTS: Calibration is required as part of this technical procedure. All instruments and/or instrument systems shall be calibrated in compliance with the YMP-USGS-QMP-12.01, Instrument Calibration for producing data under graded QA controls.*

o Verified that M&TE has been calibrated and controlled see equipment examined), with NIST traceability. Verified that the PI has an option to calibrate. (see recommendation No. 1).

HP-97 "Measurement of Temperature and Relative Humidity Using a Temperature and Relative Humidity Probe"

Paragraphs 2.2.2 and 2.2.3 state:

> *2.2.2 The wiring connections required for use of a probe with the specific CSI datalogger being used (21X, CR10, CR7X models) shall be described in the investigator's field notebook if a different wiring is used from standard wiring described by Campbell. A reference to identical wiring connections previously recorded in the field notebook can be made.*
>
> *2.2.3 The CSI datalogger program used with a probe will be noted in the investigator's field notebook or in a supplemental record. A reference to identical programming can be made if noted elsewhere. Notation is necessary when the program is changed.*

o Verified in PI Notebook - See HP-96, Items 1.

Paragraph 2.2.4 states: See HP-96, Items 2.

> *2.2.4 The data contained within the memory of the CSI datalogger is periodically transferred to a portable medium either under program or operator control. The data will be recovered by the investigator at intervals sufficiently short to insure no loss. This recovery interval will be determined by the investigator and based upon the logging frequency and number of instruments sampled.*

o See HP-96, Items 2.

Paragraph 6.0 states:

> *6.0 ACCEPTANCE CRITERIA - Operational limits of each piece of equipment used in this procedures are as follows:*
>
> *6.1 The Temperature sensor's operational error should not exceed + or - 1°C over the range of -33 to +48 degrees Celsius. Calibration results that exceed + or - 1°C shall be evaluated by the P.I. or Co-investigator to determine if rational and justifiable data corrections can be applied to the field data collected.*

6.2 The RH sensor contained within the unit should provide accuracies for relative humidity measurements to within +/- 5% RH from a range of 15% to 85% RH. Calibration results that exceed +/- 5% RH over the range of 15% to 85% RH shall be evaluated by the PI or co-investigator to determine if rational and justifiable data corrections can be applied to the field data collected. Below 15% and above 85% the accuracy is not quantified.

o Verified through review of calibration records that M&TE utilized was calibrated within acceptance criteria: +/- 1 degree C for temperature probes, +/- 5% relative humidity for relative probes. Calibration Reports for CSI Data Loggers 7255, 14227 and 13612 did not have a statement of acceptability as per Quality Management Procedure QMP-12.01 5.1.12, requirements. This condition adverse to quality has been documented in Surveillance Report YM-SR-97-011, which resulted in Performance Report YM-97-P-005.

Paragraph 8.2 states:

8.2 Calibration Records - Calibration records generated as a result of this technical procedure are approved vendor certifications. Disposition of calibration records will be in accordance with QMP-3.04, QMP-7.01, and QMP-17.01 as appropriate.

o Verified via QSL that M&TE has approved vendor certifications.

Paragraph 11.1 states:

11.1 Documents generated from implementation of this procedure may include the following: Field Notebooks, Calibration records, and any information considered by the originator to be pertinent. When in loose-leaf form, each page shall be numbered consecutively. All documents shall be signed (or initialed) and dated by the investigator on a daily basis as entries are made. Any revision to recorded information shall be lined out, initialed, and dated. Any notation by pencil shall be submitted in legible photocopy form.

o Reviewed Scientific Notebook (SN) SN-099, SN daily entries were not initialed and dated as per HP-97 and QAP- 5.5 requirements (see Performance Report YM-97-P-004).

Documents reviewed during the course of the surveillance:

Study Plan 8.3.1.2.1.1, Revision 0, "Characterization of the Meteorology for Regional Hydrology"

FWP-ESF-96-004, Revision 1, "Moisture Studies in the Exploratory Studies Facility"
HP-96, Revision 2, "Measurement of Wind Speed using a MET-ONE Inc. Model 014A Wind Speed Sensor" Revision 1
HP-97, Revision 2, "Measurement of Temperature and Relative Humidity Using a Temperature and Relative Humidity Probe"
SER Campbell Scientific Inc. Dated March 28, 1996
YMP-USGS-QMP-5.05, Revision 4, "Scientific Notebook"
YMP-USGS-QMP-12.01, Revision 7, "Instrument Calibration"
Scientific Notebook SN-099 "ESF Studies"
Deficiency Report YM-96-D-035
QSL dated January 28, 1997

Equipment Reviewed during the course of the surveillance:

Station	Location	Instrument	SN	Last Cal.	Cal Due
Temperature Relative Humidity#1	(Tunnel Boring Machine Observation Deck)	21X	7225	07/05/95	07/05/97
		T&RH Probe	P3420036	01/22/96	07/22/97
Temperature Relative Humidity#2	(Above Tunnel Boring Machine Operator Control Cab)	21X	4941	05/02/95	07/22/97
		T&RH Probe	P3420007	01/22/96	07/22/97
Temperature Relative Humidity#3	Station 07+20 (Outside Alcove 3)	21X	6445	12/04/96	12/07/98
		T&RH Probe	694040	04/19/96	04/19/97
Temperature Relative Humidity#4	Station 11+00 (Outside Alcove 4)	21X	3021	03/14/96	03/04/98
		T&RH Probe	P3510022	04/19/96	10/19/97
		M2029	Wind Speed Sensor	08/26/96	08/26/98
Temperature Relative Humidity#5	Alcove 5	21X	6776	07/27/96	03/14/98
		T&RH Probe	694022	04/05/96	10/05/97

Personnel contacted during the course of the surveillance:

William Guertal, Hydrologist, USGS
Wayne Rodman, QA Specialist, USGS
Martha Mustard, QA Specialist, USGS

Block 10 (continued) SURVEILLANCE CONCLUSIONS:

The surveillance identified one condition adverse to quality and one recommendation during the surveillance. A summary is as follows:

PR YM-97-P-004

YMP-USGS-QMP-5.05 Paragraph 5.6 " In-Process Entries" requires that in-process entries are signed and dated by the individual performing the work. A review of SN-099 revealed that entries have not been initialed and dated by personnel performing the work.

Recommendation:

HP-95 and 96, Paragraph 5.2.2 allows that " ... The PI has the option to calibrate the referenced CSI Data Loggers as shown in Paragraph 5.2.3 (instead of using CSI calibration at Logan, Utah)."

Paragraph 5.2.3 states in part: "The CSI Data Loggers (Models CR7X, CR10 or 21X) used with the MET-ONE 014A Wind Speed Sensor may be calibrated under the jurisdiction of the Principal Investigator using the calibration procedure outlined in the CSI Data Logger user's manual (using a calibrated multimeter). The investigator performing the CSI Data Logger calibration shall keep records of the calibration procedure as outlined in the CSI Data Logger user's manual."

While no PI calibrations have taken place as of the surveillance, it was noted that MET-ONE 014A, Wind Speed Sensor Manuals are not controlled. Recommend that if calibrations are to be performed by the PI that these manuals be controlled.