



Department of Energy
 Office of Civilian Radioactive Waste Management
 Yucca Mountain Site Characterization Office
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NOV 08 1996

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**ISSUANCE OF SURVEILLANCE RECORD YMP-SR-96-028 RESULTING FROM THE
 OQA SURVEILLANCE OF THE CRWMS M&O**

Enclosed is the record of Surveillance YMP-SR-96-028 conducted by the Office of Quality Assurance (OQA) at the Civilian Radioactive Waste Management System Management and Operating Contractor facilities in Las Vegas, Nevada.

The purpose of the surveillance was to investigate the reporting interfaces between Sandia National Laboratories (SNL) and Kiewit/Parsons Brinckerhoff (Kiewit/PB). Based on the results of the surveillance, it has been determined that the reporting interfaces between SNL and Kiewit/PB are marginal.

Two Deficiency Reports (DR) were issued as a result of this surveillance. Response to the DRs, which were transmitted via separate letter, are due by the date indicated in Block 12.

This surveillance is considered completed and closed as of the date of this letter. A response to this surveillance record and any documented recommendations is not required; however, the open DRs will continue to be tracked until they are 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.

Richard E. Spence
 Office of Quality Assurance

OQA:JB-0282

Enclosure:
 Surveillance Record YMP-SR-96-028

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Recip: NMSS/PAHL

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L. D. Foust

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

QUALITY ASSURANCE SURVEILLANCE RECORD

SURVEILLANCE DATA

1. ORGANIZATION/LOCATION: Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O)	2. SUBJECT: Verify effectiveness of Field Work Package (FWP) Exploratory Studies Facility (ESF)-96-003	3. DATE: September 19-27, 1996
4. SURVEILLANCE OBJECTIVE: To investigate the reporting interfaces between Sandia National Laboratories (SNL) and Kiewit/Parsons Brinckerhoff (Kiewit/PB)		
5. SURVEILLANCE SCOPE: To verify controls are in place during the installation and instrumentation of Williams Rock Bolts in the Thermomechanical Alcove Shakedown Phase of the Single Heater Test (SHT).		6. SURVEILLANCE TEAM: Team Leader: <u>John R. Doyle</u> Additional Team Members: <u>N/A</u>
7. PREPARED BY: <u>John R. Doyle</u> <u>9/16/96</u> Surveillance Team Leader Date	8. CONCURRENCE: <u>N/A</u> QA Division Director Date	

SURVEILLANCE RESULTS

9. BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

Surveillance was conducted September 19-27, 1996, at the ESF at the Yucca Mountain Site Characterization Project to evaluate the effectiveness of Quality Assurance (QA) controls in the implementation of FWP-ESF-96-003, "Thermal Testing in the Exploratory Studies Facility," Revision 1. Specific controls investigated were the interface controls between Kiewit/PB and SNL and the methodology to determine the non-Q applicability of the Williams Rock Bolt installation and grouting in the small scale SHT located in the ESF Thermal Testing Facility.

See Page(s) 2-4

10. SURVEILLANCE CONCLUSIONS:

Based on document reviews and personnel interviews and the issuance of two Deficiency Reports (DR), it has been determined that for the scope of this surveillance, the overall adequacy and effectiveness of the quality program for Kiewit/PB and Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O) is marginal.

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11. COMPLETED BY: <u>John R. Doyle</u> <u>11/1/96</u> Surveillance Team Leader Date	12. APPROVED BY: <u>[Signature]</u> <u>11/7/96</u> QA Division Director Date
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Block 9 (continued) BASIS FOR EVALUATION/DESCRIPTION OF OBSERVATIONS:

Background History

One of the results desired from the shakedown SHT phase of Thermomechanical Test Heater Block involves the testing of ground support materials (e.g., steel bolts and cementitious materials) to provide information on the behavior of these materials at elevated temperatures (up to 200 degrees centigrade) as well as the interaction of the ground support with the host rock at elevated temperature.

Two questions are raised regarding this activity: (1) What controls are in place for the transfer of the grout or other materials (Q or Non-Q) by the ESF Constructor to the scientific community; and (2) Why is the installation and grouting of these rock bolts to such an important test considered Non-Q ?

Rock bolts for the Thermomechanical Testing SHT were installed and instrumented by SNL and Kiewit/PB from June 24 through July 11, 1996. Eight Williams B7X rock bolts have been installed and instrumented for the Thermomechanical SHT. ESF-TMA-RB Numbers 1 through 4 are in the heated block, the remaining four, ESF-TMA-RB Numbers 5 through 8, are located opposite the right rib. On June 26, 1996, the rock bolt anchors were torqued in accordance with Kiewit/PB Quality Control Procedure (QCP)-006, "Williams B7X Hollow Core Rock Bolt Inspection and Testing," Revision 1, to 400 ft/lbs and bolts pre-tensioned to 1000 ft/lbs according to manufacturer's specifications. During the pretensioning process, the torque wrench broke and a decision was made to reset both the anchors and bolts on July 1, 1996. On July 3, 1996, all anchors were retorqued to 550 ft/lbs and bolts pretensioned to 900 ft/lbs and the load cells installed; the holes were to be grouted on July 3, 1996.

During this installation and instrumentation process, it came to the Principle Investigators (PI) attention that the shelf-life of the Wil-X cement grout to be used had expired and grout cube tests were requested for rock bolts ESF-TMA-RB Numbers 1 and 2. The samples were tested at the Kiewit/PB Batch Plant Laboratory. The results indicated a 7 day strength of 3125 PSI unconfined compressive strength which passes the specification minimum of 3000 PSI; however, the 28 day strength indicated 2855 PSI, which is below the specifications requirements.

As per FWP-ESF-96-003 the installation and instrumentation of these holes has been graded out as Non-Q. However, these rock bolts have been installed utilizing Kiewit/PB inspection and installation procedures and reports were generated. The letter from Costin to Elkins dated August 8, 1996, indicates that torquing is of some importance for this installation: "Each of the bolts was *preloaded* by torquing each head prior to grouting. For the SHT, it is sufficient to monitor how preload changes through time due to all causes regardless of the initial strength of the grout." Rock bolt information such as anchor torque and type of grout are recorded on a Rock Bolt Load Cell Data Sheet in accordance with Technical Procedure (TP) 245 "Calibration, Preparation, Installation, and Operations of Vibrating Wire Rock Bolt Load Cell," and considered as a *quality* data. During the surveillance, the question of why wasn't this installation

and instrumentation captured under a quality program was raised. The Technical Coordination Office response was that "It would be too hard." and that "procedures would have to be changed," (See DR-YM-97-D-006).

Kiewit/PB QA and Quality Control Managers were not aware of responsibilities and requirements of the FWP-ESF-96-003 or the existence of these types of documents. The meetings with responsible management revealed that indeed Kiewit/PB was not in the review and approval process for these documents. Construction Management Organization (CMO) is in this process and takes responsibility for notifying Kiewit/PB. According to the CMO, in the past these responsibilities have been construction-related with no QA/QC involvement. A decision was made to include Kiewit/PB in the review and approval of future FWPs. The adverse condition that each organization or technical discipline affected by the review shall review the document according to established review criteria has been documented on Deficiency Report YM-97-D-005.

Further investigation of PI provided information reveals that the grouting was done in accordance to a superseded QCP, however, the proper specification was used for this work performed. The combination of not using the proper grouting procedure, the use of grout with an expired shelf life, and the lack of Kiewit/PB in the review and approval of the FWP appears to give the indication of poor planning and putting production ahead of quality.

Documents reviewed during the course of the surveillance:

Study Plan 8.3.1.15.1.6 "In Site Thermomechanical Properties," Revision 0
FWP-ESF-96-003 "Thermal testing in the Exploratory Studies Facility," Revision 1
BABEAF00-01717-2200-00003 "Determination of Importance Evaluation for Phase 1 Testing in the TS Main Drift Thermal Region," Revision 00
BAB000000-01717-2200-00005 "Determination of Importance Evaluation for Subsurface Exploratory Studies Facility," Revision 05
TP 245 "Calibration, Preparation, Installation, and Operations of Vibrating Wire Rock Bolt Load Cell," Revision 00
QCP-018 "Inspection of Rock Bolt Inspection," Revision 3
QCP-006 "Williams B7X Hollow Core Rock Bolt Installation and Testing," Revision 1 (Canceled, Superseded by QCP-018)
Vendor Technical Procedure-002 "Rock bolt Grout Cube Sampling, Handling, and Compressive Strength Testing Procedure," Revision 4
Technical Control Procedure-2.28 "Rock bolt Pull Test Procedure," Revision 5
BABEAB000-01717-6300-02165-VD-12-1 "Rock bolts and Accessories"
Letter L. Costin to N. Elkins dated August 8, 1996

Personnel contacted during the course of the surveillance:

Howard Cox, Quality Control Manager, Kiewit/PB
Robert Armstrong, QA Manager, Kiewit/PB
Ned Elkins, Manager, Field Test Management, M&O/LANL
Richard MacDonald, CMO Manager, M&O/Morris Knudsen (MK)
Toby Wightman, Project Manager, Kiewit/PB
Richard Bennett, QA Engineer, M&O/Duke Pavon
Andrew Burningham, QA Liaison, M&O/TRW
Chuck Garrett, Supervisor Title III Design, M&O/MK
Larry Costin, PI, M&O/SNL
Ray Finley, PI, M&O/SNL
Doug Weaver, Project Engineer, M&O/LANL

Block 10 (continued) SURVEILLANCE CONCLUSIONS:

The surveillance identified two conditions adverse to quality and one recommendation. A summary is as follows:

YM-96-D-005

The Quality Assurance Requirements and Description (QARD) DOE/RW-0333P, Revision 5, requires that each organization or technical discipline affected by the document be included in the review. During the course of the surveillance it was determined that Kiewit/PB was not included in the review process of FWP-ESF-96-003.

YM-96-D-006

Rock bolt tensioning torque is an essential baseline of the Thermomechanical Testing. Rock bolt load cells are installed in accordance with SNL's TP 245 and these values can be used for baseline calculations. This activity was conducted by Kiewit/PB with PI overview and was called out as Non-Q in FWP-ESF-96-003. The QARD, Section 2.2.3, requires that "... The QA program shall apply to site characterization data and samples."

The following recommendations is for management consideration and require no formal response.

Recommendation

Industry-wide high temperature cementitious materials are available. It is recommended that instead of using low temperature with an expired shelf life grout, management and the scientific community should explore the possibility of using high temperature materials for future thermal test experiments.