



Department of Energy

Washington, DC 20585

QA: L

JUL 24 1997

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for Yucca Mountain Site
Characterization Project
U.S. Geological Survey
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**ISSUANCE OF SURVEILLANCE RECORD USGS-SR-97-036 RESULTING FROM THE
OFFICE OF QUALITY ASSURANCE (OQA) SURVEILLANCE OF THE U.S. GEOLOGICAL
SURVEY (USGS) REVIEW OF MAPS AT THE YUCCA MOUNTAIN SITE**

Enclosed is the Quality Assurance Surveillance Record USGS-SR-97-036 conducted by the OQA
of USGS at the Nevada Test Site, on June 4-5, 1997.

The surveillance addressed implementation of the technical review process during the field review
of portions of map deliverable "Geologic Map of the Yucca Mountain Site Area."

It was determined that implementation of the Quality Assurance Requirements and Description
document and the applicable USGS Quality Management Procedures are satisfactory and
effectively implements the applicable elements of the Office of Civilian Radioactive Waste
Management Quality Assurance Program.

If you have any questions, please contact either James Blaylock at (702) 794-1420 or
Donna J. Sinks at (303) 236-0516, extension 317.


Donald G. Horton, Director
Office of Quality Assurance

OQA:JB-1954

Enclosure:
Surveillance Record USGS-SR-97-036

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recip. NMSS DATA

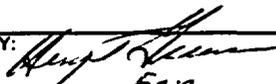
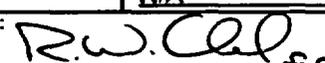
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**OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.**

Surveillance No. USGS-SR-97-036

QUALITY ASSURANCE SURVEILLANCE RECORD**SURVEILLANCE DATA**

1. ORGANIZATION/LOCATION: United States Geological Survey (USGS)/Yucca Mountain Site	2. SUBJECT: Technical Review of Central Block Map of Yucca Mountain	3. DATE: June 4-5, 1997
4. SURVEILLANCE OBJECTIVE: Determine adequacy of the USGS review process		
5. SURVEILLANCE SCOPE: Observe the formal USGS review of the Central Block Map of Yucca Mountain to verify implementation of applicable QARD requirements and USGS procedures.		6. SURVEILLANCE TEAM: Team Leader: Donna J. Sinks Additional Team Members: N/A
7. PREPARED BY:  Donna J. Sinks Surveillance Team Leader	Date 5/28/97	8. CONCURRENCE:  Donald G. Horton Director, OQA
		Date 5/29/97

SURVEILLANCE RESULTS

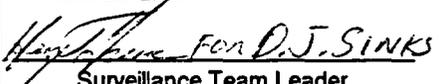
9. BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

A surveillance of the field technical review process for a map deliverable in support of CWBS 1.2.3.2.2.1.2, Structural Features Within the Site Area, was conducted at the Nevada Test Site and Nellis Air Force Range. Selected portions of the "Geologic Map of the Yucca Mountain Site Area" (deliverable SPG22M3) were reviewed. The authors of the map are Warren Day, Bob Dickerson, Chris Potter, Don Sweetkind, Carma San Juan, Chris Fridrich, and Ron Drake. The two technical reviewers on the field review were Mike Chornack and Dan Soeder. This surveillance verified that the review process was conducted adequately and appropriately in accordance with applicable requirements of the QARD and YMP-USGS-QMP-3.04.

The field technical review concentrated on the more complex areas of the site area map that had not been previously reviewed. The site area map incorporates newly mapped areas with the following two previously mapped and reviewed areas:

- Bedrock Geologic Map of the Central Block Area, Yucca Mountain, Nye County, Nevada; by W.C. Day, C.J. Potter, D.S. Sweetkind, R.P. Dickerson, and C.A. San Juan (technical review completed; in final preparation for submittal to the Project)
- Geologic Map of the Paintbrush Canyon Area; by R.P. Dickerson and R.M. Drake III (technical reviews completed)

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10. SURVEILLANCE CONCLUSIONS: Based on observation of the field technical review process and discussions with the authors and reviewers of the site area map, it was determined that the personnel involved in the review process were very familiar with the procedural requirements and the technical issues of the mapped area. In addition, the technical discussions between the authors and USBR personnel enabled the authors to correlate surface-based data with subsurface data. Therefore, it was determined that implementation of QARD and the QMP is satisfactory and effectively implements the applicable elements of the OCRWM QA program.	
11. COMPLETED BY:  Surveillance Team Leader	12. APPROVED BY:  Director, OQA
Date 7/17/97	Date 7/23/97

9. BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS: (Cont'd)

Surveillance personnel accompanied technical and review personnel to Windy Wash (northwest of the Prow) and to an area northwest of Ambush Pass (northwest of Busted Butte) to observe the field review and to discuss the review process. Initially, a check was made to determine if the USGS review process met the requirements of the QARD. QMP-3.04 adequately incorporates the QARD requirements of Sections 2.2.10 and Section III.2.4. Next, a determination was made if the field review of this map met the requirements of QMP-3.04, primarily Section 5.2. General review criteria are established in QMP-3.04 (Section 5.2.2) and are to be considered by the reviewers. The specific objectives and/or established requirements, required by Section 5.2, are provided in the USGS Summary Account Planning Sheet (Summary Account Number OG32212FB2) and were available for the reviewers. Since the field technical review did not cover the two mapped areas previously reviewed, a data transcription check (QMP-3.04, Section 5.2) was not necessary at this time. There were no source data for the mapped areas covered during this field technical review.

Each reviewer was provided with a draft of the site area map and other maps at various scales to assist in locating stratigraphic contacts, structural features, etc. During the surveillance the authors and reviewers discussed various structural and stratigraphic features and interpretations. The discussions were enthusiastic and comprehensive for the areas examined. In some cases, the locations of lithologic contacts and fault traces were revised on the review copies of the map to reflect comments from the reviewers and consensus by the authors.

Mapping was conducted using methods detailed in technical procedure YMP-USGS-GP-01, R2-M1, Geologic Mapping. Topographic maps at 10-foot contour intervals were used as base maps. These were then composited onto orthophoto maps. The 1:24000 site area map was produced from Mylar topographic sheets and digitized using AutoCAD (versions 12 and 13).

Three reviewers were selected to review the map. Mr. Chornack and Mr. Soeder are very familiar with the complex lithology and stratigraphy of the site area. Both have been reviewers of Project maps and reports of surface-based and underground mapping. Mr. Soeder had previously accompanied the authors of this map to Windy Wash, Dune Wash, Busted Butte, and Solitario Canyon. He has also conducted technical reviews of the full-periphery geotechnical maps (FPGMs) of the ESF, produced by the U.S. Bureau of Reclamation (USBR). Mr. Chornack also previously accompanied the authors to Fran Ridge, Dune Wash, Busted Butte, as well as conducted technical reviews of the FPGMs and the ESF detailed line surveys. Both will be conducting technical reviews of the final site area map and accompanying manuscript. R. Ernest Anderson, a geologist with the Geologic Division of the USGS, also was selected to conduct a technical review of the final map and manuscript. He is a recognized expert in structural geology and regional tectonics of the Southern Great Basin and also is a member of the Probabilistic Seismic Hazards Analysis review team. Based on his expertise, his review will provide a valuable perspective of the structural interpretation of the mapped area.

As mapping has progressed, the authors also have discussed their structural and stratigraphic interpretations with the USBR personnel who have mapped the ESF and produced the detailed line surveys and the full-periphery geotechnical maps. These discussions have enabled the authors, and USBR personnel, to assist one another in making interpretations which correlate the surface-based mapping with borehole data and the ESF mapping.

PERSONNEL CONTACTED:

<u>Personnel</u>	<u>Organization</u>	<u>Role</u>
M. P. Chornack	USGS	Technical Reviewer, Hydrologist
W. C. Day	USGS	Principal Investigator, Geologist
R. P. Dickerson	USGS/PWT	Geologist
C. J. Potter	USGS	Geologist
D. J. Soeder	USGS	Technical Reviewer, Hydrologist

REFERENCED DOCUMENTS:

- DOE/RW-0333P, R7, U.S. DOE OCRWM Quality Assurance Requirements and Description.
- YMP-USGS-GP-01, R2-M1, Geologic Mapping.
- YMP-USGS-QMP-3.04, R9, Review and Approval of YMP-USGS Data. Interpretations of Data, and Manuscripts.