

OCT 15 1993

Mr. Dwight E. Shelor, Associate Director  
 for Systems and Compliance  
 Office of Civilian Radioactive Waste Management  
 U. S. Department of Energy  
 1000 Independence Avenue, SW  
 Washington, DC 20585

Dear Mr. Shelor:

**SUBJECT: ACCEPTANCE REVIEW OF THE TOPICAL REPORT TITLED "EVIDENCE OF EXTREME EROSION DURING THE QUATERNARY PERIOD" AT YUCCA MOUNTAIN, NEVADA**

The subject of this letter is the Nuclear Regulatory Commission's acceptance review of the U.S. Department of Energy's (DOE) Topical Report, "Evaluation of the Potentially Adverse Condition of Extreme Erosion During the Quaternary Period" at Yucca Mountain, Nevada, dated March 1993. This review was conducted in accordance with the guidelines established in the NRC Division of High-Level Waste Management Topical Report Review Position Paper (TRPP), provided to DOE on April 7, 1993. Additional details regarding the acceptance criteria used by the staff in making its findings are described in the following paragraph.

Based upon its evaluation of the information provided, the staff finds the document acceptable for review as a topical report. Secondary findings include: (1) a request that DOE provide several items (including references, data packages, and backgrounds/resumes) prior to the staff's initiation of the technical review and (2) the staff determination (to be reached during the detailed technical review) as to the acceptability of the DOE's position on the beginning of the Quaternary Period (1.6 million years ago).

Although the topical report is considered appropriate for review, initiation of the staff's technical review is dependent upon receipt of the following items:

**Topical Report** - Two printed copies of the report are necessary since the photocopied report presently available to the staff contains many illegible figures. These figures are considered essential for staff review.

**Data Packages** - The March 1993, supplement to the DOE's Technical Data Base Catalog contains a number of extreme erosion-related data packages. The staff requests that DOE provide the data packages indicated on pages 49-51 of the supplement (see Enclosure).

102-B  
 WM-11  
 NH16

020116

9311030360 931015  
 PDR WASTE  
 WM-11 PDR

Mr. Dwight E. Shelor

2

Backgrounds and Resumes - In order to determine the technical acceptability of the data contained in the report, the backgrounds and resumes of the five members of the Technical Assessment Team, as well as that of the Technical Assessment Chairperson, are requested.

Another document, the P. A. Glancy "in press" reference, remains unpublished. In keeping with guidance provided in the Topical Report Review Position Paper, statements made in the topical report that are attributable to the reference, are not considered supportable until the published document is received by the staff.

The secondary finding relative to the DOE's position that onset of the Quaternary Period was 1.6 million years ago, conflicts with the staff position that, "for regulatory purposes," the age of the Quaternary Period is 2.0 million years<sup>1</sup>. More recently, this staff position has been reiterated in the March 1993 Public Comment Draft of the NUREG "Staff Technical Position on Consideration of Fault Displacement Hazards in Geologic Repository Design." The staff evaluation of the DOE Quaternary definition position is a matter that will be addressed during the technical review.

If you have any questions concerning this acceptance review, please contact Paul T. Prestholt of my staff at (301) 504-3810.

Sincerely,

Original Signed by



for Joseph J. Holonich, Director  
Repository Licensing and Quality Assurance  
Project Directorate  
Division of High-Level Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: As stated

cc: See next page

---

<sup>1</sup> Nuclear Regulatory Commission, "Staff Analysis of Public Comments on Proposed Rule 10 CFR Part 60, 'Disposal of High-Level Radioactive Wastes in Geologic Repositories,'" Office of Nuclear Regulatory Research, NUREG-0804, December 1983.

Mr. Dwight E. Shelor

3

- cc: R. Loux, State of Nevada
- T. J. Hickey, Nevada Legislative Committee
- J. Meder, Nevada Legislative Counsel Bureau
- C. Gertz, DOE/NV
- M. Murphy, Nye County, NV
- M. Baughman, Lincoln County, NV
- D. Bechtel, Clark County, NV
- D. Weigel, GAO
- P. Niedzielski-Eichner, Nye County, NV
- B. Mettam, Inyo County, CA
- V. Poe, Mineral County, NV
- F. Sperry, White Pine County, NV
- R. Williams, Lander County, NV
- L. Fiorenzi, Eureka County, NV
- J. Hoffman, Esmeralda County, NV
- C. Schank, Churchill County, NV
- L. Bradshaw, Nye County, NV

DISTRIBUTION

CNWRA  
 LPDR  
 BYoungblood, HLWM  
 JHolonich, HLPD

NMSS R/F  
 ACNW  
 JLinehan, HLWM  
 On-Site Reps

HLPD R/F  
 PDR  
 RBallard, HLGE

LSS  
 CENTRAL FILE  
 MFederline, HLHP

OFC	HEDD	E	HLGE	E	HLPD	E		
NAME	PPrestholt/dh		RBallard		JHolonich			
DATE	10/13/93		10/1/93		10/15/93			

C = COVER

E = COVER & ENCLOSURE

N = NO COPY

g:\exerrev.ptp

OFFICIAL RECORD COPY

U.S. DEPARTMENT OF ENERGY

**W  
A  
C  
O  
M**



**YUCCA MOUNTAIN  
SITE CHARACTERIZATION  
PROJECT**

**YUCCA MOUNTAIN  
SITE CHARACTERIZATION PROJECT**

**TECHNICAL DATA  
CATALOG  
(QUARTERLY SUPPLEMENT)**



**MARCH 31, 1993**  
UNITED STATES DEPARTMENT OF ENERGY

9305200134 4pp.

ENCLOSURE

SITE CHARACTERIZATION PLAN BASELINE

T  
D  
I  
F  
T  
Y  
P  
E

Q  
U  
A  
L  
I  
T  
Y  
I  
N  
D  
E  
X

DATA TRACKING NO.	TITLE/DESCRIPTION	ACQN/DEVL PERIOD	ACQN/DEVL METHOD	
*GS930208315215.012	U AND SR IN GROUNDWATER AND CALCITE, YUCCA MOUNTAIN, NEVADA: EVIDENCE AGAINST UPWELLING WATER, BY J.S. STUCKLESS, A.E. PETERMAN, AND D.R. MUHS.  ACQN/DEVL LOCATION : USGS, DENVER, CO	01/01/90-02/13/91	SUMMARIES AND INTERPRETATIONS OF U AND SR ISOTOPIC COMPOSITIONS OF GROUNDWATER AND HYDROGENIC DEPOSITS IN THE YUCCA MOUNTAIN AREA AND INTERPRETATIONS OF THE ORIGIN OF THESE DEPOSITS.	D N P
*GS930208315215.013	ISOTOPIC DISCONTINUITIES IN GROUNDWATER BENEATH YUCCA MOUNTAIN, NEVADA, BY J.S. STUCKLESS, J.F. WHELAN, AND W.C. STEINKAMPF.  ACQN/DEVL LOCATION : USGS, DENVER, CO	01/01/90-11/27/90	REVIEW AND PRELIMINARY EVALUATIONS OF PREVIOUSLY PUBLISHED AND UNPUBLISHED DATA/INFORMATION OF STABLE ISOTOPIC DATA FOR GROUNDWATER IN THE YUCCA MOUNTAIN AREA AND ADJACENT TO FORTYMILE WASH.	D N P
Activity - B.3.1.6.1.1.f				
(N) *GS930108316111.001	"PRELIMINARY DESCRIPTION OF QUATERNARY AND LATE PLIOCENE SURFICIAL DEPOSITS AT YUCCA MOUNTAIN AND VICINITY, NYE COUNTY, NEVADA" BY D.L. HOOVER  ACQN/DEVL LOCATION : USGS, DENVER, CO	01/01/87-06/14/89	COMPILATION OF EXISTING DATA RESULTING IN A DESCRIPTION OF QUATERNARY AND LATE PLIOCENE SURFICIAL DEPOSITS AT YUCCA MOUNTAIN AND VICINITY.	D N P
(N) *GS930208316111.002	FIELD NOTES FROM OBSERVATIONS OF THE SOUTH-FACING HILLSLOPE OF JAKE RIDGE, ABOUT 6 KM EAST OF YUCCA MOUNTAIN, WHERE DEBRIS FLOWS OCCURRED IN JULY, 1984.  ACQN/DEVL LOCATION : N236550 (N) E176850 (N)	10/25/89-11/24/92	FIELD NOTES WERE RECORDED ACCORDING TO SPECIFICATIONS IN USGS TECHNICAL PROCEDURE GP-01, R1 & R2, GEOLOGIC MAPPING.	A N P

(N) Requested by NRC

T Q  
D U L  
I A O  
F L C  
I A  
T F T  
Y I I  
P E O  
E D N

## SITE CHARACTERIZATION PLAN BASELINE

DATA TRACKING NO.	TITLE/DESCRIPTION	ACQN/DEVL PERIOD	ACQN/DEVL METHOD	
(N) *GS930208316111.003	PRE- AND POST-DEBRIS-FLOW DIGITAL ELEVATION MODELS (WITH 2M SPATIAL RESOLUTION) OF THE SOUTH-FACING HILLSLOPE OF JAKE RIDGE, ABOUT 6 KM EAST OF YUCCA MOUNTAIN.	07/01/91-10/25/91	DIGITAL ELEVATION MODELS (DEM'S) WERE MEASURED FROM PRE-FLOW (1982) AND POST-FLOW (1991) AERIAL PHOTOGRAPHS USING AN ANALYTICAL STEREO PLOTTER AND A PREVIOUSLY EXISTING SET OF GROUND CONTROL POINTS.	A N P
	ACQN/DEVL LOCATION : N236420(N) E176730(N) ;N236750(N) E176970(N) USGS, DENVER, CO			
(N) *GS930208316111.004	VOLUMETRIC ANALYSIS OF DEBRIS ERODED FROM A HILLSLOPE NEAR YUCCA MOUNTAIN DURING A CONVECTIVE STORM, BY J.A. COE, P.A. GLANCY, & J.W. WHITNEY.	07/01/91-02/05/93	VOLUMES OF DEBRIS ERODED WERE CALCULATED BY NUMERICAL INTEGRATION OF A DIFFERENCE DEM CREATED BY SUBTRACTING THE PRE-DEBRIS-FLOW DEM FROM THE POST-DEBRIS-FLOW DEM. INTER-CHANNEL AREAS AND DIFFERENCE VALUES THAT FELL WITHIN THE 2 SIGMA MEASUREMENT ERROR (+/- 0.3M) WERE NOT INCLUDED IN THE VOLUMETRIC CALCULATION.	D N P
	ACQN/DEVL LOCATION : USGS, DENVER, CO			
†TMTPR00000001.001	TOPICAL REPORT - EVALUATION OF THE POTENTIAL ADVERSE CONDITION "EVIDENCE OF EXTREME EROSION DURING THE QUATERNARY PERIOD" AT YUCCA MOUNTAIN, NEVADA	03/01/92-03/08/93	NEW DATA WAS DEVELOPED BY ANALYSIS AND EVALUATION OF EXISTING DATA.	D Y C
	ACQN/DEVL LOCATION : T&MSS			

(N) Requested by NRC

SITE CHARACTERIZATION PLAN BASELINE

T  
D  
I  
F  
T  
Y  
P  
E

Q  
D  
I  
F  
T  
Y  
P  
E

U  
L  
O  
C  
A  
T  
I  
O  
N

DATA TRACKING NO.	TITLE/DESCRIPTION	ACQN/DEVL PERIOD	ACQN/DEVL METHOD	
Activity - 8.3.1.6.1.1.2				
*TMTPR000000001.001	TOPICAL REPORT - EVALUATION OF THE POTENTIAL ADVERSE CONDITION "EVIDENCE OF EXTREME EROSION DURING THE QUATERNARY PERIOD" AT YUCCA MOUNTAIN, NEVADA	03/01/92-03/08/93	NEW DATA WAS DEVELOPED BY ANALYSIS AND EVALUATION OF EXISTING DATA.	D Y C
	ACQN/DEVL LOCATION : T&SS			
Activity - 8.3.1.6.1.1.3				
(N) *LA00000000011.001	ROCK VARNISH CATION-RATIO DATA	06/30/84-07/31/88	FIELD SAMPLING, SEM ANALYSIS	A Y C
	ACQN/DEVL LOCATION : YUCCA MOUNTAIN AND VICINITY			
(N) *LA00000000026.002	ROCK-VARNISH CATION RATIO DATA AND ROCK-VARNISH DATING CURVE CALIBRATION SITES DATA	07/01/86-06/30/91	FIELD SAMPLING, SEM ANALYSIS	D Y C
	ACQN/DEVL LOCATION : LANL			
(N) *LA00000000029.001	"BARIUM CONCENTRATION IN ROCK VARNISH: IMPLICATIONS FOR CALIBRATED ROCK VARNISH DATING CURVES"	05/01/89-11/30/89	SCANNING ELECTRON MICROSCOPE METHOD FOR ROCK VARNISH DATING.	D Y C
	ACQN/DEVL LOCATION : LANL			
(N) *LA00000000030.001	"BARIUM CONCENTRATION IN ROCK VARNISH: IMPLICATIONS FOR CALIBRATED ROCK-VARNISH DATING CURVES; SCANNING MICROSCOPY.	11/30/89-01/30/91	SCANNING ELECTRON MICROSCOPE METHOD FOR ROCK-VARNISH DATING.	D Y C
	ACQN/DEVL LOCATION : LANL			

(N) Requested by NRC