

15

See Pocket 2 for  
Enclures

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102/BR/84/10/23/0

- 1 -

Distribution:

- WM sf
- WMGT rf
- NMSS rf
- RBrowning
- MBell
- MKnapp
- PJustus
- BRice & rf
- PDR
- KSablein
- CGlenn
- SOlney
- JTrapp
- JCutler
- MElackford
- LPDR

MEMORANDUM FOR: Seth Coplan, Leader  
 NNWSI Project Section  
 Repository Projects Branch

FROM: Benjamin Rice  
 Geology/Geophysics Section  
 Geotechnical Branch

SUBJECT: NNWSI SITE VISIT AND GEOLOGY/GEOPHYSICS DATA REVIEW

From September 17th through 28th, 1984, the WMGT Geology/Geophysics Section, WMRP NNWSI Project Section, and several other NRC staff members participated in a field site investigation and data review of the NNWSI. The field investigation portion of the trip was conducted on September 17th through 21st and included a visit to the U. S. Geological Survey's Core Library, G-Tunnel, and several stops on and around Yucca Mountain. The second portion of the trip involved a visit to the USGS offices in Menlo Park, California (September 24 and 25) and Denver, Colorado (September 26, 27, and 28) where geologic and geophysical data sets and maps were reviewed.

The following pages contain a summary of the data sets reviewed and the stops made during the field investigation. A subsequent report will follow this summary identifying our findings and comments on the data observed. The following are attached: a listing of attendees; NRC data catalog requests; field trip map; copies of the completed data review checklists; WMEG trip report; the table of contents of the USGS quality assurance manual; and the NRC post-meeting requests for data.

151

Benjamin Rice  
 Geology/Geophysics Section  
 Geotechnical Branch

Enclosure:  
As stated

WM Record File  
102

WM Project 11  
 Docket No. \_\_\_\_\_  
 PDR   
 LPDR

Distribution: \_\_\_\_\_  
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*446*

*Enclosure to 11/184  
memo from BKice  
to Seth Caplan  
102*

## GEOLOGY-GEOPHYSICS DATA REVIEW SUMMARY

MONDAY, SEPTEMBER 17th:

1. U.S. Geological Survey - Core Library visit Mercury, Nevada

Core Data Reviewed:

- o USW-G2 core (surface to total depth)
- o USW-G1 core (1189.7 - 1291.1 ft; 1351.6 - 1415.6 ft; and  
1971.3 - 2027.7 ft.)
- o USW-GU3 core (1091 - 1199.5 ft; 1364 - 1421.4 ft)
- o UE-25p-1 core (paleozoic dolomite interval - 4297.9 to 4368.2 ft)
- o USW-G1 3-D velocity log
- o USW-GU3 3-D velocity log
- o Pavement study maps and air photos
  
- o USW-G4 core (Reviewed by Engineering Staff) - see attached report
- o UE-25h-1 core (Reviewed by Engineering Staff) - see attached report

2. G-Tunnel Visit  
Rainier Mesa, Nevada Test Site

Features Observed:

- o Lithologic Contacts
- o Fracture Sets and Zones
- o Heater Block Tests

TUESDAY, SEPTEMBER 18th:

Field Trip (a) -

- o along crest of Yucca Mountain for a regional overview; into a north-south trending wash on the southern side of Yucca Mountain to see major fault patterns and lithologic contacts; back along the crest of Yucca Mountain; and down a wash to well G4 (exploratory shaft location) to observe major joint sets.

Note - See attached map for locations of traverses

WEDNESDAY, SEPTEMBER 19th:

1. Field Trip (b) -

- o overturned beds and complex faulting on Yucca Mountain near Busted Butte
2. Field Trip (c) -
    - o observed major strike-slip fault along the southern side of Sever Wash
  3. Field Trip (d) -
    - o observed a large slump block on the northern edge of Yucca Mountain in Yucca Wash
  4. Field Trip (e) -
    - o observed pavement surface jointing near the USW G4 well location

THURSDAY, SEPTEMBER 20th:

Trenches Visited -

1. Rock Valley trenches RV1 and RV2
2. Trenches 11 and 13 in Yucca Wash
3. Drill Hole Wash trench 14

FRIDAY, SEPTEMBER 21th:

Trenches Visited -

1. Trenches 8 and 10b in Solitario Canyon
2. Crater Flat trenches CF1, CF2, and CF3

MONDAY, SEPTEMBER 24th: (USGS Offices, Menlo Park, CA)

The following data sets were presented by the indicated USGS investigator and reviewed by NRC staff:

1. Tuff Strength - James Byerlee, Bldg. 8, Room 8B04
2. In Situ Stress Measurement - Mark Zoback (for Jack Healy), Bldg. 8, Room 8190
3. Tuff Seismic P-Wave Residual Study - Mahadeva Iyer and John Evans, Bldg 8, Room 8211
4. Neotectonics - Jim Yount, Bldg. 7, Room 4243
5. Gravity & Magnetism - Howard Oliver, Bldg. 2, Room 2274
6. Regional Geology - Michael Carr, Bldg. 7, Room 7268

## TUESDAY, SEPTEMBER 25th: (USGS Offices, Menlo Park, CA)

1. Seismic Refraction - Walter Mooney, Bldg. 8, Room 8175 & 7B32
2. Geodetic Surveys - Will Prescott, Bldg. 8, Room 8226
3. Neotectonics (continued) - Jim Yount, Bldg. 7, Room 4243

## WEDNESDAY, SEPTEMBER 26th: (USGS Offices, Denver, CO)

1. Refraction/Reflection - Hans Ackerman, Denver West Bldg. II, Room 125
2. Site Geology - Robert Scott, Denver West Bldg. II, Room 208
3. Borehole Geophysics - Kibbler (for Don Healy and Douglas Muller), Denver West Bldg., Rooms 112, 113, and 114
4. Regional Geology - W.C. Swadley and David Hoover, Denver West Bldg., Room 236
5. Seismicity - Al Rogers, 1711 Illinios Ave., Golden, Colorado, Room 436

## THURSDAY, SEPTEMBER 27th: (USGS Offices, Denver, CO)

1. Petrophysics - Lennart Anderson, Denver West Bldg. II, Room 119
2. Regional Geology - Will Carr, Denver West, Bldg. III, Room 367
3. Geochronology - C. Bush, Denver Federal Center, Bldg. 15, Room 107
4. Zeolites - Richard Sheppard, Denver Federal Center, Bldg. 25, Room J1618
5. Strain Measurements - Tom Bray, Denver Federal Center, Bldg. 25, Room 1454C
6. Magnetic Properties - Joseph Rosenbaum, Denver West Bldg. II, Room 130

## FRIDAY, SEPTEMBER 28th:

1. Site Geology - Richard Spengler, Denver West, Bldg II, Room 203
2. Magnetic Studies - Gordon Bath and Richard Blank, Denver Federal Center, Bldg. 53, Room 12930
3. USGS QA Manual - Joe Willman, Denver Federal Center, Bldg. 53, Room 12930

NNWSI GEOLOGY DATA REVIEW  
NTS ATTENDEES  
9/17/84 - 9/21/84

<u>NAME</u>	<u>AFFILIATION</u>
Dinesh C. Gupta	NRC
David H. Tiktinsky	NRC
Robert L. Treat	Corps of Engineers (NRC Consultant)
Johnathan M. Cutler	NRC
Chad J. Glenn	NRC
John S. Imse	Weston Geophysical Corp. (NRC Consultant)
Philip S. Justus	NRC
Linda A. Kivach	NRC
Vincent J. Murphy	Weston Geophysical Corp. (NRC Consultant)
Sylvie L. Olney	NRC
Paul T. Prestholt	NRC
Benjamin J. Rice	NRC
N. K. Stablein	NRC
John S. Trapp	NRC
Elmar Baltz	USGS
Robert N. Scott	USGS
R. W. Swadley	USGS
Richard W. Spengler	USGS
Chris Barton	USGS
Michael D. Carr	USGS
James C. Yount	USGS
R. R. Shroba	USGS
Gary Dixon	USGS
M. H. Hait	USGS
David Jorgenson	SAIC
Michael Glora	SAIC
T. S. Szymanski	WMPO
Ralph H. Richards	WMPO
D. Price	Pan Am Photo Services
Martha Pendleton	Williams Brothers/Roy F. Weston (DOE Consultant)
Carl A. Johnson	State of Nevada
D. Burton Slemmons	University of Nevada - Reno (NRC Consultant)
John W. Bell	Nevada Bureau of Mines and Geology
Alv Dan Youngberg	USGS, GTN

DOE - NRC - USGS DATA REVIEW  
 MENLO PARK, SEPT. 24, 1984

<u>Name</u>	<u>Affiliation &amp; Telephone</u>	<u>Field</u>
Elmer H. Baly	USGS	Geologist
M. A. Blum	SAIC	Licensing
Charles (Rus) Purcell	Consultant/NRC	Geomorphology
JOHN S. TRAPP	NRC	Engineering Geologist
VINCENT J. MURPHY	WESTON GEOPHY. (NRC CONTRACTOR)	GEOPHYSICIST
PHILIP JUSTUS	NRC	Geology-Geophysics S.L.
CARL JOHNSON	STATE OF NEVADA	Geologist
Paul T. Prestholt	NRC on site Rep.	Geophysicist
N. King Stabilein	NRC 8-427-4611	Geologist
Charles Mann	NRC 8-427-4608	Mineralogist
Natlem S. Tanious	NRC 8-427-4736	Mining / GeoEngineering
DIMESH C. GUPTA	NRC 8-427-4742	Rock Mechanics
JOHN LIMSE	WESTON GEOPHYSICAL (617-366-9191) (NRC CONTRACTOR)	Geology/Geophysics
BENJAMIN RICE	NRC FTS 427-4646	GEOPHYSICS
Jonathan Cutler	NRC FTS 427-4762	Geology
Michael Blackford	NRC FTS 427-4597	SEISMOLOGY
Stan Klein	SAIC FTS 575-0854	Quality Assurance
MICHAEL CARR	USGS	Geologist
VICKIE SUTTON	USGS FTS 467-2222	GEOPHYSICS - TECH.
Desiree Stuart-Alexander	USGS 467-2353	Geologist
H.M. Iyer	USGS 467-2685	Geophysicist

John R. Evans	USGS	467-2423	Geophysicist
Moses Smith	USGS	467-2923	PST
William Ives	Western Support Team (DOE-HQ)	301/963-5212	Manager, Geotechnical Sect. Site Assessment & Licensing
DAN YOUNGBERG	DOE/HQ	301-353-5428	GEOLOGIST
Jim Yoast	USGS	467-2905	Geologist
ED HELLEY	USGS	8-467-2462	GEOLOGIST CO-ORDINATOR FOR NUWIST IN MENDO
Walter MOONEY	USGS	8-467-2476	Geophysicist M.P.
Mark Zoback	STANFORD (USGS)	415-497-9438	GEOPHYSICIST
Jim Rymer	USGS	323-8111 x 2453	Geophysicist
Will Prescott	USGS	8-467-2701	Geophysicist
Diane Moore	USGS	323-8111 x 2597	Geologist
Carolyn Morrow	USGS	323-8111 x 2597	geologist
TOM SCHMITT	NRC		SEISMOLOGIST
DAE CHUNG	LLNL (FOR NRC)		GEOPHYSICIST
LARRY MCKAGUE	LLNL (FOR NRC)		GEOLOGIST

DOE-NRC-USGS  
DATA REVIEW - Denver, Sept. 26, 1984

<u>Name</u>	<u>Affiliation</u>	<u>Field</u>
Elmer Beatty	USGS	Geologist
BENJAMIN RICE	NRC	GEOPHYSICIST
John S. TAPP	NRC 306-427-4545	Engineering Geologist
Charles (Rus) Purcell	Consultant/NRC 714-556-2707	Geomorphology
CARL JOHNSON	STATE OF NEVADA 702 885-3744	Geologist
Paul Prestholt	U.S. NRC on site rep FTS 598-6125	Geophysicist
King Stablein	US NRC FTS 427-4611	Geochemist
M. U. Slav	SAIC FTS 575-1463	Licensing
AL ROBBAS	USGS	Geophysicist
TOM BRAY	USGS FTS 236-5812	Cartographer
JOHN INSE	WESTERN GEOPHYSICAL NRC CONSULTANT	Geologist/Geophys.
VINCENT MURPHY	"	Geophysicist
DK Hoover	USGS	Geologist
R.F. Harwin	USGS	Geologist
Joe Rosenbergum	USGS	Geophysicist
Don Nealey	USGS	Geologist
LEN ANDERSON	USGS	Geophysicist
Brad Myers	USGS FTS 776-236-1274	Geologist
Rick Fungler	USGS FTS 776-1286	Geologist
Floian Mallonata	USGS FTS 776-1281	Geologist
WC Swadley	USGS " 776-1264	Geologist
M.H. Hait, Jr.	USGS " 776-1286	"
B.J. Szabo	USGS	Geochemist
C.A. Bush	USGS 236-4722	Geophysicist
C.W. Nasser	USGS 236-4720	Geologist
John Rasholt	USGS 263-4722	Chemist

W. I. Carr  
R. J. Sisson  
Carl Henry  
Richard A. Hayes  
William W. Dudley  
David Sargerson

USGS  
USGS  
NRC  
USGS  
USGS  
SAI

Geologist  
"  
Geologist  
Geologist  
NNUWI Technical Project Officer  
Geologist

## DATA REQUESTS

## A. WELL LOGS:

USW G1, H5, G2, G3, H4, and UE25P-1  
( Perhaps H6)

## B. TRENCHES:

1. CF2 and CF3  
CF1, 8, and 10B
2. 11 and/or 13, 14, 17 and Rock Creek Fault Trenches

## C. CORE:

H5 - Surface down to host rock  
host rock, and 100' on either side

UE25P-1 Paint Brush Canyon Fault and  
associated breccia zone. Approx. 50'

Fanglomerate Interval Approx. 50'

Fran Ridge Fault Approx. 50'

Devonian Dolomite Approx. 50'

H3 - Host Rock Approx. 100'  
maybe 50'

Non-welded tuff immediately below host rock Approx. 50'

G1 - Host Rock Approx. 100'

Non-welded tuff below host rock Approx. 50'

Non-welded tuff below the water table Approx. 50'

G2 - Host Rock	Approx. 100'
Non Welded Tuff below Host Rock	Approx. 50'
Low Angle extension fault	Approx. 50'
Flows and Flow Breccias at N 1500 meters depth.	Approx. 100'
WT2 - Host Rock	Approx. 100'
G3 - Host Rock	Approx. 100'
Non-welded tuff below host rock	Approx. 50'

## Enclosure 2

USGS DATA INDEX  
REGIONAL GEOLOGY

Principal Investigator: Michael D. Carr

File Location: Menlo Park, Bldg. 7, Room 7268

<u>Category</u>		<u>Description</u>
1. Fault map of site vicinity	o	Compilation showing ages of faults from published maps
2. Regional geologic data	o	Thin sections

USGS DATA INDEX  
REGIONAL GEOLOGY

Investigator: James C. Yount

File Location: Menlo Park, Bldg. 7, Room 4243

<u>Category</u>		<u>Description</u>
3. Neotectonics	o	Trench logs, photos, fabric data, scarp-profile data, and miscellaneous maps

USGS DATA INDEX  
REGIONAL GEOLOGY

Investigator: David L. Hoover

File Location: Denver West Bldg. 11, Room 236

<u>Category</u>		<u>Description</u>
4. Quaternary map of Yucca Mtn area	o	Aerial photos and compiled map
5. Quaternary history of Yucca Mtn area	o	Fortymile wash profile data and summarized climatic data

## USGS DATA INDEX

## REGIONAL GEOLOGY

Investigator: WC Swadley

File Location: Menlo Park, Bldge. 7, Room 7268

<u>Category</u>		<u>Description</u>
6. Surficial deposits of NTS region	o	Geologic maps, aerial photos, and general field data
7. Quaternary faulting	o	Trench diagrams, scarp profiles, and photographs in area of Yucca Mountain

## USGS DATA INDEX

## REGIONAL GEOLOGY

Investigator: Wilfred J. Carr

File Location: Denver West Bldg. III, Room 367

<u>Category</u>
8. Sketches of several trenches
9. Profiles of several fault scarps

10. Isotopic-age sample data
11. Quaternary-fault map compilation data
12. Miscellaneous geologic mapping
13. Compilation of site-vicinity map for Site Characterization Report
14. G.E. Program contract report on Death Valley-Furnace Creek fault zone
15. W. Gawthrop contract report on relocation of earthquake epicenters in SW Great Basin

USGS DATA INDEX

REGIONAL GEOLOGY

Investigator: John W. Whitney

File Location: Denver West, Bldg. II, Room 325

<u>Category</u>	<u>Description</u>
16. Quaternary Faulting	o Compilation of air photo lineaments
	o Map showing compilation of faults around Yucca Mtn.

USGS DATA INDEX

SITE GEOLOGY

Principal Investigator: Richard W. Spengler

File Location: Denver West, Bldg. II, Room 203

<u>Category</u>	<u>Description</u>
1. Drill holes	o Palomagnetic and foliation data

USW G-1 and G2

USW G3/GU3

USW H-1 through H-6

- |                                 |   |  |
|---------------------------------|---|--|
| 2. Drill holes UE25b-1, USW G-4 | o | Updated versions of lithologic logs                    |
| 3. Drill hole                   | o | Geophysical and x-ray data from hydrologic drill holes |
|                                 |   |  |
| UE25p1                          |   |  |
| 4. General fracture data        | o | TV-camera observation                                  |
| 5. Drill hole USW G-1           | o | Oriented-core data                                     |
|                                 | o | Original and revised fracture compilation              |
|                                 | o | Televiewer log   |
|                                 |   |  |
| 6. Acoustic-log data            |   |  |
| 7. Drill hole USW G-2           | o | TV observations  |
| 8. Drill hole USW-G3/GU3        | o | Fracture data from core                                |
| 9. Drill hole USW-G4            | o | Petrographic studies and fracture studies              |
|                                 |   |  |
| 10. Drill hole USW-G1           | o | Projection of shear fracture data to surface           |
|                                 |   |  |
| 11. Drill hole H4               | o | TV camera observations                                 |
|                                 | o | Acoustic logs  |
|                                 |   |  |
| 12. Drill hole USW H-5          | o | TV camera observations                                 |
|                                 | o | Acoustic logs  |
|                                 |   |  |
| 13. Yucca Mtn                   | o | General stratigraphic information                      |
|                                 | o | Attitudes of stratigraphic units                       |
|                                 | o | Surface fracture study (F and S)                       |

- |                                 |   |                           |
|---------------------------------|---|---------------------------|
| 14. Lithophysae                 | o | Field studies             |
| 15. Drill holes                 | o | Physical properties data  |
| 16. Yucca Mountain              | o | Trench data               |
|                                 | o | Surface geology           |
|                                 | o | Photogrammetry            |
|                                 | o | Aeromagnetics             |
|                                 | o | Radioisotope study        |
|                                 | o | Exploratory shaft         |
| 17. Drilling                    | o | Schedule                  |
|                                 | o | Criteria                  |
|                                 | o | Histories                 |
|                                 | o | Programs                  |
| 18. Drill holes                 | o | Directional data          |
|                                 | o | Fluid losses              |
| 19. Drill holes USW G-1 and G-4 | o | Oriented-core data sheets |

## USGS DATA INDEX

## SITE GEOLOGY

Investigator: C. C. Barton

File Location: Geologic Data Center, Mercury, Nevada,

USGS Office, map case

- | <u>Category</u>                   |   | <u>Description</u>           |
|-----------------------------------|---|------------------------------|
| 20. Pavement studies of fractures | o | Unbound data sheets and maps |

## USGS DATA INDEX

## SITE GEOLOGY

Investigator: Robert B. Scott

File Location: Denver West Bldg. II, Room 208

<u>Category</u>		<u>Description</u>
21. Fractures	o	Data on fractures in drill holes USW H-4 and H-5
22. Hydrofracs	o	Data on drill hole USW G-3
23. Isotopic data	o	Data on drill hole USW GU-3/G-3
24. Measured stratigraphic sections at Yucca Mtn	o	Prow Pass, Tiva Canyon, and Topopah Spring Members
25. Slickenside data	o	Results from Yucca Mtn mapping
26. Stratigraphic description	o	Subunits of Tiva Canyon Member
27. Drill hole USW GU-3/G3	o	Core index
	o	Criteria letter
	o	Daily operations
	o	Drilling program and reports
	o	Fracture data from video camera
28. Fracture data	o	From cores of drill holes USW GU-3/G-2, G-3, G-4
29. Ash flow tuffs	o	Chemistry of tuffs at Yucca Mtn
30. Yucca Mtn geology	o	Aerial photographs of Yucca Mtn geology
31. Rock samples	o	From drill holes USW G-3/GU-3, USW G-1

o Thin section and  
petrographic data

USGS DATA INDEX

SITE GEOLOGY

ZEOLITE IN TUFF

Investigator: Richard A. Sheppard

File Location: Denver Federal Center, Bldg, 25, Room J1618

Various data sets under development to understand the distribution, genesis, and significance of the zeolite, mordenite, in tuffs of Yucca Mtn. Includes x-ray diffraction mineralogy of samples from core from drill holes USW-G-1, G2, G4, and UE25b-1H; optional microscopy of thin sections and grain mounts; scanning electron microscopy; and electron microprobe analysis.

USGS DATA INDEX

REGIONAL GEOPHYSICS

GRAVITY AND MAGNETICS

Principal Investigator: Howard W. Oliver

File Location: Menlo Park, Bldg. 2, Room 2274

<u>Category</u>		<u>Description</u>
1. Gravity field data	o	Paper
2. Magnetic field data	o	Paper
3. Station location and elevation control data		
4. Terrain correction data		
5. Rock sample data		

USGS DATA INDEX  
 REGIONAL GEOPHYSICS  
 SEISMIC REFRACTION

Principal Investigator: Walter D. Mooney

File Location: Menlo Park, Bldg. 8, Rooms 8175, 7B32

<u>Category</u>		<u>Description</u>
1. Topographic and orthophoto maps	o	Seismic-recorder and shotpoint location
2. Surveying readings and measurements	o	List of laser-surveyed location with field notes
3. Field data sheets	o	Field notes containing: Blue Sheets-recorder locations Green Sheets-lat. and long. Map measurements
	o	White Sheets-chronometer readings of seismic-recorders
4. Bibliography	o	Publication of Analytical Results: USGS Open-File Report 83-598, Copy of calibration specifications

USGS DATA INDEX  
 SITE GEOPHYSICS  
 BOREHOLE GEOPHYSICS

Principal Investigator: Douglas Muller

File Location: Denver West Bldg. II, Rooms 112 and 113

<u>Category</u>	<u>Description</u>
1. Geophysical logs	o Paper copies of commercial logs
2. Data files	o Supporting data for geophysical log data reports--drilling histories, deviation surveys, core data, geologic data, and miscellaneous data. Located in room 113
3. Computer plots	o Preliminary and final plots of computer log data for data reports

## USGS DATA INDEX

## SITE GEOPHYSICS

## Borehole Geophysics

Investigator: Don L. Healy

File Location: Denver West Bldg. II, Room 112 and 114

<u>Category</u>	<u>Description</u>
4. Borehole gravity meter (BHGM) surveys	o Strip charts of beam velocities
5. Free-air gradient (FAG) surveys	o Field sheets o Earth tides chart o Tables of inner zone o Terrain correction data o Reduction notes o Computer printouts of FAG calculations

## USGS DATA INDEX

## SITE GEOPHYSICS

## PETROPHYSICS

Principal Investigator: Lennart Anderson

File Location: Denver West Bldg. II, Room 119

<u>Category</u>	<u>Description</u>
1. Rock property analysis of core samples obtained from Yucca Mtn. boreholes UE25G-1, UE-25-p-1; USW G-3 and G-4	o natural bulk density, natural state and saturated resistivity, induced polarization, compressional sonic velocity, magnetic susceptibility and remanent magnetization

## USGS DATA INDEX

## SITE GEOPHYSICS

## REFRACTION AND REFLECTION

Principal Investigator: Hans D. Ackeman

File Location: Denver West Bldg. II, Room 125

<u>Category</u>	<u>Description</u>
1. Reflection data	o Well log data o Reports on data collected
2. Refraction data	o Velocity analysis from well logs at Yucca Mtn o Well velocities from check shots and

3. Deep refraction
- o lithologic logs, maps, field sheets
  - o Beatty processing
  - o Crater Flats processing

## USGS DATA INDEX

## SITE GEOPHYSIS

## MAGNETIC PROPERTIES OF TUFF

Principal Investigator: Joseph G. Rosenbaum

File Location: Denver West Bldg., II, Rm., 130

<u>Category</u>	<u>Description</u>
1. Rock and paleomagnetic data from drill holes in Yucca Mountain area	<ul style="list-style-type: none"> <li>o Remanent magnetization and susceptibility data</li> <li>o Copies of orientation data for oriented core runs</li> <li>o Curie temperature determinations</li> <li>o Drill holes USW G-1, G-2, GU-3, G-3</li> </ul>
2. Rock and Paleomagnetic data from surface outcrops in Yucca Mountain area	<ul style="list-style-type: none"> <li>o Field notes for sampling locations</li> <li>o Maps showing locations of sampling sites</li> <li>o Remanent magnetization and susceptibility data</li> </ul>

## USGS DATA INDEX

## SITE GEOPHYSICS

## TUFF STRENGTH

Principal Investigator: James Byerlee

File Location: Menlo Park Bldg. 8, Room 8-804

<u>Category</u>		<u>Description</u>
1. Initially intact samples		
a) Topopah Springs Member of the Paint Brush Tuff	o	Stress-strain data
b) Bullfrog Member of the Crater Flat Tuff	o	Stress-strain data
2. Sawcut Samples		
a) Topopah Springs Member of the Paint Brush Tuff	o	Stress-strain data
b) Bullfrog Member of the Crater Flat Tuff	o	Stress-stain data

USGS DATA INDEX

SITE GEOPHYSIS

IN SITU STRESS MEASUREMENTS

Principal Investigator: Jack Healy

File Location: Menlo Park, Bldg. 8, Room 8190

<u>Category</u>		<u>Description</u>
1. Pressure-time records from hydrofracture test	o	Chart paper, field notes
2. Pressure-time records from hydrofracture tests	o	Field data and notes (pressure gage records)
3. Televiewer photos	o	Original pictures
	o	Geophysical logs
	o	Core descriptions

## USGS DATA INDEX

## GEOCHRONOLOGY

Investigator: C. A. Bush

File Location: Denver Federal Center, Bldg. 15, Room 107

<u>Category</u>	<u>Description</u>
1. Gamma Ray spectrometry	o Gamma-spectrometry computer interpretation data
	o Tables of radioelement concentration and ratios
	o Final reports

## USGS DATA INDEX

## SEISMOLOGY

## TUFF SEISMIC P-RESIDUAL STUDY

Principal Investigators: Mahadeva Iyer and John Evans

File Location: Menlo Park, Bldg. 8, Room 8211

<u>Category</u>	<u>Description</u>
1. Field documentation recorder operation (4 books)	o Field rates describing
	o Field maps showing location of portable stations
2. Notebooks	o General information notebook
	o "WAT" hardcopy notebook, final visual records of

- o seismograms and picks  
"Distazkes" printed  
output binder
- 3. Software o Program listings binder
- 4. Computer files o Pick times (archive of  
pick time files)

## USGS DATA INDEX

## SEISMOLOGY

## SEISMICITY OF SOUTHERN GREAT BASIN

Principal Investigator: A. M. Rogers

File Location: Room 436, 1711 Illinois, Golden, Colorado

<u>Category</u>	<u>Description</u>
1. Earthquake catalogs	<ul style="list-style-type: none"> <li>o Historical catalog through July 1978</li> <li>o SGB Network catalog from August 1978 to the present</li> <li>o Network catalog including events from 114.5° to 118.0° W. and from 35.6° N. to 38.5° N.</li> </ul>
2. Earthquake computer codes	<ul style="list-style-type: none"> <li>o Real-time event detection of PDP 11/34</li> <li>o Event location, focal mechanism, code-wave analysis, spectral analysis codes and data</li> <li>o Attenuation program and data</li> <li>o Velocity inversion programs</li> </ul>

- 3. Earthquake first-motion data
  - o P-wave first motions have been computer-plotted for about 80 percent of the local SGB eqs from Jan. 1982 to the present
- 4. Yucca Mountain events
  - o Information on blasting on Yucca Mtn. has been obtained to distinguish small blasts from legitimate earthquake near the proposed repository site

## USGS DATA INDEX

## GEODETIC SURVEYS

Principal Investigator: Will Prescott

File Location: Menlo Park, Bldg. 8, Room 8226

<u>Category</u>	<u>Description</u>
1. Geodetic surveys by laser ranging	<ul style="list-style-type: none"> <li>o Network diagram for NTS surveys</li> <li>o Horizontal strain rates versus time</li> <li>o Line lengths versus time</li> <li>o Field data sheets for all line length observations (time, instrument readings, aircraft meteorologic data)</li> </ul>

## USGS DATA INDEX

## STRAIN MEASUREMENTS

Principal Investigator: Tom Bray

File Location: Denver Federal Center, Bldg. 25, Room 1454-C

<u>Category</u>	<u>Description</u>
1. Level line	o Field leveling data o Instrument collimation data o Abstract o Mark descriptions
2. Quadrilaterals	o Distance records o Leveling data o Vertical angle records o Instrument Calibration data
3. Summary	o A summary of the 1983, 1983-84 quadrilateral and level-line results

USGS DATA INDEX

CORE LIBRARY

Investigators in charge: Gary L. Dixon and M. H. Hait

File Location: Geologic Data Center, Mercury, Nevada

<u>Category</u>	<u>Description</u>
1. Drill holes	Note: See Enclosure 1, Specific interval requests

Location: File #7, Bldg. 158

USW G-1, G2, and G3

UE25p1

USW H4, H5, and Perhaps H6

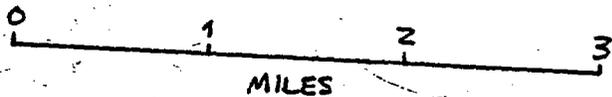
2. Geophysical Logs

- o Records physical Properties Rock Material being logged. Examples: Caliper, density, temperature log, etc.

3. Photographs

Note: See Enclosure 1, specific interval requests for cores.

Enclosure 3



a 3-13

L A S V E G A S B O M

U C O N

F I O R T Y M I

IOB

IT

G U N N E N E

RV1  
RV2

N I N I A

IT

IT

Reviewer Ken Stabern  
 Date 9/25/84

## GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Permeability and pore-fluid chemistry studies of the  
 Bullfrog Tuff and of the Topopah Springs Tuff  
 (3 experiments) (6 experiments)

2. When were the above data collected?

1982 - 1984 (ending 3/84)

3. Who collected the data?

Diane Moore, who works for Jim Byerlee

4. Where is the data stored?

— strip charts  
 Diane Moore's office — notebooks containing all numbers  
 Trailer 7 (lab where experiments are run) — plots of Al and  
 anions

5. What was the objective or purpose of the survey?

To assess the effects of increasing temperature on  
 the permeability and pore fluid chemistry of

6. What parameters were determined? What features were mapped or logged?

Cations:  $K^+$ ,  $Na^+$ ,  $Ca^{+2}$ ,  $Mg^{+2}$ ,  $Al^{+3}$   
 Anions:  $HCO_3^-$ ,  $SO_4^{+2}$ ,  $F^-$ ,  $Cl^-$ ,  $NO_3^-$ ,  $NO_2^-$   
 Silica, pH, conductivity, total phosphorous

Reviewer King Shallem

Date 9/25/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

*Not Applicable*

8. How much data were collected (number of samples/traverses, etc)?

*10-20 samples per experiment (9 experiments - see #1)*

9. What methods, procedures, or techniques were used in gathering the data?

*Chemical Analyses: AA (cations)  
Ion Chromatograph (anions)  
Spectrophotometer (silica)  
Carbon Analyzer (carbon)  
pH meter (pH)  
Conductivity Meter (conductivity)*

*SOLMNEQ computer program (1973) is used for calculating silica speciation and for mineral saturation at high T*

10. Are the methods, procedures, or techniques under which the data were gathered documented?

*Trailer 7, the Chem Lab holds most of the chemical procedures. Many are ASTM or other standard procedures. Pertinent settings and other numerical information for runnery analyses are typed on the machines or on sheets encased in plastic. QA procedures are readily available in lab notebooks. There are some procedure notes in Diane's data notebooks.*

11. When are the data to be published? In what publication series? If already published when and in what document?

*All the data are published except for the last studies on the Topopah Springs Member of the Paintbrush Tuff, which will be published as a USGS Open File Report around 1/85. The other publications are listed on the attached sheet.*

### NNWSI Reports

- Morrow, C., and Byerlee, J., Frictional sliding and fracture behavior of some Nevada Test Site Tuffs, Rock Mechanics in Productivity and Protection, 25th Symposium on Rock Mechanics, C. Dowding and M. Singh, ed., Evanston, IL., p. 467, June 1984
- Morrow, C., Moore, D., and Byerlee, J., Permeability and pore-fluid chemistry of the Bullfrog Tuff in a temperature gradient. Rock Mechanics: Theory Experiment and Practice, Proceedings of the 24th U. S. Symposium on Rock Mechanics, C. Mathewson, ed. College Station, TX, p. 819, June 1983
- Morrow, C., Moore, D., and Byerlee, J., Permeability and pore-fluid chemistry of the Topopah Spring Member of the Paintbrush Tuff, Nevada Test Site, in a temperature gradient - Application to nuclear waste storage, Scientific Basis for Nuclear Waste Management VII, Materials Research Society Symposia Proceedings, vol. 26, 883, Boston, MA, 1984
- Byerlee, J., Morrow, C., and Moore, D., Permeability and pore-fluid chemistry of the Bullfrog Tuff in a temperature gradient: Summary of results. U. S. Geological Survey Open-File Report 83-475
- Moore, D., Morrow, C., and Byerlee, J., Changes in permeability and fluid chemistry of the Topopah Spring Member of the Paintbrush Tuff (Nevada Test Site) when held in a temperature gradient: Summary of results U. S. Geological Survey Open-file Report 84-273
- Moore, D., Morrow, C., and Byerlee, J., Permeability studies of the Topopah Spring Member of the Paintbrush Tuff, Nevada Test Site: Part II, U. S. Geological Survey Open-File Report, in review.

Reviewer Schmitt

Date 25-9-1984

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Rock Friction tests. Saw cut and Intact

2. When were the above data collected?

Dates of tests range from 21 March 83 - 16 Sept 83

3. Who collected the data?

J. Byerlee Lab.

4. Where is the data stored?

In the rock mechanics Lab at Menlo Park

5. What was the objective or purpose of the survey?

Determine strength of intact and pre-cut rocks at various pressure.

6. What parameters were determined? What features were mapped or logged?

Strength as function of confining pressure  
Coeff. of friction as function of total strain

Reviewer Schwitt

Date 25-9-1987

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

Topopah Springs and bullfang tuff.  
Samples were supplied by Livermore.  
Surface outcrops.

8. How much data were collected (number of samples/traverses, etc)?

Data from about 50 ~~tests~~ tests  
were in the Notebooks that I examined.

9. What methods, procedures, or techniques were used in gathering the data?

"Standard" - testing machine, computer controlled, ~1" samples,  
pressure applied.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Procedures  
are well  
documented in  
Lab notes.

The procedures are standard in Byerlee's Lab.  
The procedures were developed through a series of experiments  
to assure results were not affected by machine factors.  
Examples: Tests were made to verify that urethane was  
suitable for jacking. Tests were made to verify  
that friction on pallets would not affect measurement.  
Load cells were calibrated by Heise Gauge -

11. When are the data to be published? In what publication series? If already published when and in what document?

Published 25<sup>th</sup> Symposium on Rock Mechanics 1984  
C. Morrow + J. Byerlee.

Reviewer

in the

Date

7/20/84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Trench mapping for trenches XV-1 XV-2  
Actual trenches visited. Sketches made

2. When were the above data collected?

Trenches opened in 1979, relogged in detail  
in 1981

3. Who collected the data?

Tom Mount + Ralph Shroba of USGS did  
trench mapping. Trench photos made by  
Tom Mount

4. Where is the data stored?

Tom Mount's storage photo room

5. What was the objective or purpose of the survey?

To determine magnitude, timing, & nature  
of Rock Valley faulting

6. What parameters were determined? What features were mapped or logged?

Rock Valley stratigraphy established, incl.  
late Miss. uranium trends noted where  
applicable. Timing of grades slip faulting  
determined on Rock Valley.

Reviewer

L. T. ...

Date

2/20/54

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

Trenches approx 2 meters high x 30+ meters long.

8. How much data were collected (number of samples/traverses, etc)?

Mapped (RV2) on 1 ~~meter~~ meter square grid w/ photos taken of each grid segment. Uranium trend data shade. Detailed trench map made for RV2 - In progress for RV1.

9. What methods, procedures, or techniques were used in gathering the data?

see above

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Not sure

11. When are the data to be published? In what publication series? If already published when and in what document?

All trench data are intended to be published in E-75.

Reviewer

Little

Date

2/20 + 9/21

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Trenches 8, 10b, 11, 13, 14 visited and compared at reconnaissance sketch maps.

2. When were the above data collected?

cut + prelim. logged - spring 1982

3. Who collected the data?

Two Swadlow was Principal & Mr.  
~~Swadlow~~

4. Where is the data stored?

N.T. case

5. What was the objective or purpose of the survey?

To determine the magnitude + extent of Quaternary faulting around Tucca str.

6. What parameters were determined? What features were mapped or logged?

Trench cross sections made at various. Map of faults, some found, interpreted based on Quaternary around stratigraphy.

Reviewer

*Cutler*

Date

*9/20 + 9/21/5*

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

*111 trenches, 2 m x 3 m x 30 m  
trenches banded where depth > 2  
m NTS area.*

8. How much data were collected (number of samples/traverses, etc)?

*Acad. maps only - detail work  
supplied to field*

9. What methods, procedures, or techniques were used in gathering the data?

*2 meter grid mapped rectangles*

10. Are the methods, procedures, or techniques under which the data were gathered documented?

*Not sure.*

11. When are the data to be published? In what publication series? If already published when and in what document?

*All trench data sched. to be  
pub. in F495 by USGS*

Reviewer N. Taniouss / D. Gupta

Date Sept 24, 84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Hydrofracture Data for USW- G 1

2. When were the above data collected?

December 1981.

3. Who collected the data?

USGS.

4. Where is the data stored?

USGS office, Bldg 2  
Menlo Park

5. What was the objective or purpose of the survey?

In-situ stress measurement

6. What parameters were determined? What features were mapped or logged?

Minimum horizontal stress and Maximum horizontal stress.

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

USW G-1

21- 26 to 42-5 ft

8. How much data were collected (number of samples/traverses, etc)?

Six hydrographic tracks in USW G-1

9. What methods, procedures, or techniques were used in gathering the data?

Hyd. track

10. Are the methods, procedures, or techniques under which the data were gathered documented?

In USGS open files

11. When are the data to be published? In what publication series? If already published when and in what document?

In process via ...

Publication

Reviewer D. Gubler / N. Taminus

Date Sept 24 1982

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Hydrofracture Test, USW - G 2

2. When were the above data collected?

Oct 10 — Nov 5, 1982

3. Who collected the data?

UCGS

4. Where is the data stored?

Mendo Park, CA

5. What was the objective or purpose of the survey?

In-situ stress determination

6. What parameters were determined? What features were mapped or logged?

Minimum horizontal stress, Maximum horizontal stress

Reviewer D. Gupta / N. Tamou

Date Sept 24, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

270 ft to 1000 ft

8. How much data were collected (number of samples/traverses, etc)?

3 depth intervals

9. What methods, procedures, or techniques were used in gathering the data?

Hydrostatic test

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Yes

11. When are the data to be published? In what publication series? If already published when and in what document?

Already published

USGS Open-File 84-172

Reviewer D. GUPTA / N. Taniou

Date Sept 24, 84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Hydro-fracture Test, USW-93

2. When were the above data collected?

December 1983

3. Who collected the data?

USGS

4. Where is the data stored?

Menlo Park CA

5. What was the objective or purpose of the survey?

In-situ stress determination

6. What parameters were determined? What features were mapped or logged?

Maximum Horizontal stress and Maximum Horizontal stress

Reviewer D. Gupta / N. Taniyas

Date Sept 21, 84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

3525 ft to 4450 ft

8. How much data were collected (number of samples/traverses, etc)?

None test depths etc

9. What methods, procedures, or techniques were used in gathering the data?

Hydrofracture test

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Yes

11. When are the data to be published? In what publication series? If already published when and in what document?

1985-86

Reviewer D. GUPTA / N. Taniou

Date Sept 21 84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Hydro-fracture test = Hole Ue 25 P #1

2. When were the above data collected?

January 1984

3. Who collected the data?

USGS

4. Where is the data stored?

Mentis Park, CA

5. What was the objective or purpose of the survey?

In-situ stress determination.

6. What parameters were determined? What features were mapped or logged?

Least horizontal stress, Maximum horizontal stress

Reviewer GUPTA / TANIOUS

Date SEPT 24, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

From 5100' to 5685 ft.

8. How much data were collected (number of samples/traverses, etc)?

Tools at four depth intervals.

9. What methods, procedures, or techniques were used in gathering the data?

Hydrographer

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Yes

11. When are the data to be published? In what publication series? If already published when and in what document?

1985-86.

Reviewer RICE

Date SEPT. 24, 1984

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

GRAVITY SURVEYS AT YUCCA MOUNTAIN

2. When were the above data collected?

COLLECTED AND COMPILED OVER SEVERAL YEARS

3. Who collected the data?

HOWARD OLIVER - COORDINATOR

4. Where is the data stored?

USGS, MENLO PARK, BLDG. II, ROOM 2274

5. What was the objective or purpose of the survey?

TO DEVELOP THE GRAVITY FIELD IN THE YUCCA MOUNTAIN REGION — EVENTUALLY TO FORMULATE A STRUCTURAL MODEL FOR THE REGION

6. What parameters were determined? What features were mapped or logged?

GRAVITY FIELD DATA

Reviewer RICE

Date SEPT. 24, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

DATA COMPILED AND PROCESSED FOR 4 1:250,000  
SCALE MAPS IN THE YUCCA MOUNTAIN REGION

8. How much data were collected (number of samples/traverses, etc)?

~~20~~ A TOTAL OF ~20,000 DATA POINTS

9. What methods, procedures, or techniques were used in gathering the data?

SEE NO. 10

10. Are the methods, procedures, or techniques under which the data were gathered documented?

USGS OFR-474-263 , OFR-474-305, OFR-474-260,  
AND OFR-78-1012

11. When are the data to be published? In what publication series? If already published when and in what document?

NEVADA BUREAU OF MINES AND GEOLOGY MAPS 61,  
68, 69, & 70

Reviewer BEN RICE

Date SEPT. 24, 1984

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

TRENCH MAPPING - ROCK VALLEY 1 AND 2 TRENCHES

2. When were the above data collected?

TRENCHES DUG IN 1978 - MAPPING COMPLETED IN  
THE SPRING OF 1984

3. Who collected the data?

JAMES YOUNT, RALPH SHREIBER, CAMERINE MCMASTERS,  
AND HEATHER LUCKINS

4. Where is the data stored?

USGS, MEDIAL EAPC - BLDG 7, ROOM 7243

5. What was the objective or purpose of the survey?

IDENTIFY QUATERNARY (RECENT) GEOMORPHIC PROCESSES -  
RECENT FAULTING AND DEFORMATION AND THE NATURE  
OF DISPLACEMENT ON THE ROCK VALLEY FAULT.

6. What parameters were determined? What features were mapped or logged?

FAULTS - FRACTURES, SOIL COMPOSITION, AGE DATING,

Reviewer BEN RICE

Date SEP 24 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

TWO S.E. 220 TRENCHES ALONG THE ROCK VALLEY FAULT  
IN ROCK VALLEY UP FROM ROUTE 75 AS OF MERCURY, NV.

8. How much data were collected (number of samples/traverses, etc)?

TWO TRENCHES ALONG THE ROCK VALLEY FAULT LINES 1 AND 2  
- EASTERN WALLS ONLY -

9. What methods, procedures, or techniques were used in gathering the data?

TRENCHES WERE DUG AND SAMPLES WERE TAKEN, -  
THERE WERE WHEN DUG TO 5 FEET DEPTH (SEE LOGS FOR DETAILS)

10. Are the methods, procedures, or techniques under which the data were gathered documented?

NO, NOT FOR METHODS AND TECHNIQUE - MAP OF THE  
MAPPED GRIDS HAS BEEN PHOTOGRAPHED AND HAS BEEN  
COPYLOGED - PROCEDURES AND UNIT DESCRIPTIONS ARE  
CONTAINED IN A PRELIMINARY REPORT ENTITLED "TRENCH  
LOGS FROM A STRAND OF THE ROCK VALLEY FAULT SYSTEM, NTS"

11. When are the data to be published? In what publication series? If already published when and in what document?

WILL BE SUBMITTED TO THE NTS AT AN EARLY DATE AFTER  
(OFFER POSSIBLE IN A COMING YEAR)

Reviewer C. Glenn

Date 9-24-84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

*Index To Published Geologic Maps in the Region Around The Potential Yucca Mountain Nuclear Waste Repository Site, Southern Nye County, Nevada. Compiled by Suzanne C. Pruty*

2. When were the above data collected?

*Above index compiled in 1984.*

3. Who collected the data?

*USGS*

4. Where is the data stored?

*Menlo Park, California*

5. What was the objective or purpose of the survey?

*Series of index maps presented in this report provide an up-to-date reference of published geologic maps covering the Yucca Mt. area.*

6. What parameters were determined? What features were mapped or logged?

*Compilation of Geologic Maps of Yucca Mt area*

Reviewer C. Glenn

Date 9-24-84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

*Approx. 100 kilometer area around Yucca Mt.*

*Published maps range in scale from 1:1200 to 1:700,000 and include maps published by USGS, State, Commercial organizations, universities and professional societies.*

8. How much data were collected (number of samples/traverses, etc)?

*Index includes 120 references of geologic maps in region.*

*Index includes an Appendix A of related Ph.D. Dissertations in Region Around The Potential Yucca Mountain Nuclear Waste Repository Site.*

9. What methods, procedures, or techniques were used in gathering the data?

*Compilation of published maps of area*

10. Are the methods, procedures, or techniques under which the data were gathered documented?

*N/A*

11. When are the data to be published? In what publication series? If already published when and in what document?

*This information will be published under Open File Report. To be published in 1984.*

Reviewer M. BLACKFORD

Date 9-24-84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

*Survey of deep crustal structure beneath Yucca Mtn. repository site using P-residual data from teleseismic sources*

2. When were the above data collected?

*Data collection began in April, 1982 and is continuing*

3. Who collected the data?

*John Evans & H. M. Iyer, USGS*

4. Where is the data stored?

*In Menlo Park under control of Evans & Iyer at USGS Western Regional Hq, Bldg #8*

5. What was the objective or purpose of the survey?

*The objective of the survey is to defined the gross (23-5km resolution) structure of the deep crust/upper mantle structure.*

6. What parameters were determined? What features were mapped or logged?

*P-waves from teleseismic sources were timed using a refinement scheme involving correlation of waveforms from several close-spaced stations*

Reviewer M. Blackford

Date 9-24-84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?  
*P-wave data were collected from the USGS NTS network operated by Rogers from the Denver Regional Hq. augmented by a set of 20 stations with ~5 km spacing near Yucca Mt.*
  
8. How much data were collected (number of samples/traverses, etc)?  
*Several (exact number not asked for) teleseisms primarily from the NW, SW, & SE quadrants were used as sources for residual determination*
  
9. What methods, procedures, or techniques were used in gathering the data?  
*Data recorded on both analog (Rogers) and digital (Rogers, Evans & Iyer) tape. Rogers - some data on "day tapes", later data on Malone/UWash type event detector system. Evans & Iyer - 5-day portable recorders. Timing system drift ~10-15 ms over recording period*
  
10. Are the methods, procedures, or techniques under which the data were gathered documented?  
*Yes, field logs on portable system contain information on equipment used, outages, timing data, tape serial numbers*
  
11. When are the data to be published? In what publication series? If already published when and in what document?  
*Publication date uncertain - targeting Nature & a New Mexico state geological journal in addition to USGS OFR. Earlier work done by Monfort & Evans USGS OFR 82-409*

Reviewer Philip S Justus  
Date 9/24/84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis map/core?

PRELIMINARY FAULT MAP OF THE BEATTY 30'x60' SHEET

2. When were the above data collected?

FY 84

3. Who collected the data?

Suzanne C. Fouty

4. Where is the data stored?

Mike Carr's office, USGS, Menlo Park, CA

5. What was the objective or purpose of the survey?

Compile fault mapping in Yucca Mtn region in response to Draft NRE Umbrella STP on issues and 10CFR60 guidelines

6. What parameters were determined? What features were mapped or logged?

- ① fault location & length & estimated buried extensions
- ② youngest formations cut by the faults

Reviewer PSJ  
Date 7/24/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

Beatty 1:100,000 30'x60' standard topo base

8. How much data were collected (number of samples/traverses, etc)?

About 19 published and unpublished source maps  
(see overlay to Beatty map: Index Map Bibliography)

9. What methods, procedures, or techniques were used in gathering the data?

Ordinary drafting techniques

10. Are the methods, procedures, or techniques under which the data were gathered documented?

See S. Fonty's "Fault Compilation: Notes, Beatty 1:100,000 Overlap"  
dated July, 1984, 2 looseleaf books.

11. When are the data to be published? In what publication series? If already published when and in what document?

FY 85

open-file map → Misc. Info map

Reviewer ~~W. H. R. Purcell~~ R. Purcell

Date 9/24/84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Regional Fault Map Compiled from pub. maps (mostly GQ maps)  
Seismicity map overlay shows stations + epicenters.  
All compiled onto Beatty 1:100,000 scale topo.

2. When were the above data collected?

11/83 - 7/84

3. Who collected the data?

Suzanne Fouty, USGS - Menlo Park, WRG

4. Where is the data stored?

Mike Carr's Office, USGS, Menlo Park

5. What was the objective or purpose of the survey?

To compile all published faults from the literature onto the Beatty 1:100,000 Quad including defining and interpreting all variances in mapping etc from quad to quad.

6. What parameters were determined? What features were mapped or logged?

Age of published faults. No original mapping. However, many individual interpretations were made based on discussions with authors etc.

Reviewer R. Purcell

Date

9/24/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

Beaty 1:100,000 Quad-

8. How much data were collected (number of samples/traverses, etc)?

N/A

9. What methods, procedures, or techniques were used in gathering the data?

Literature review and discussions with authors of unpublished data.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Interpretive methods documented ~~in two places, not in complete~~ agreement  
(description of how Quaternary Faults were determined)  
~~No description~~

11. When are the data to be published? In what publication series? If already published when and in what document?

4-6 mos. Probably as a Geologic Quadrangle map.

Reviewer Cutler  
Date 9/24

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Also CAI indexes for same core  
Thin sections from sil/Dev. core in Ue25P-1.  
Two carbonate formations, lower one is organic rich. Dolomite desc. based on HCl test only

2. When were the above data collected?

Chips for sections collected from Ue25P-1 core when it was drilled.

sections described <sup>Fall</sup> ~~spring~~ '83. Orig. descriptions not available (reason unclear), only saw descriptions condensed for publication.

3. Who collected the data?

section cut by independent lab.  
sections described by Susan Monsen.  
CAI work done by Anita Harris.

4. Where is the data stored?

Menlo Park - Held by M. Carr.  
CAI samples prob. retained by A. Harris.

5. What was the objective or purpose of the survey?

For texture & primary features in sil/Dev section.

6. What parameters were determined? What features were mapped or logged?

Lithologic Descriptions + CAI indexes.  
(~3)

Reviewer Cutler

Date 9/24.

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

*From Ue25P-1 Stan 4000' + 5000'*

8. How much data were collected (number of samples/traverses, etc)?

*~15 Thin sections*

9. What methods, procedures, or techniques were used in gathering the data?

*Full thin section description emphasizing texture.*

10. Are the methods, procedures, or techniques under which the data were gathered documented?

*No.*

11. When are the data to be published? In what publication series? If already published when and in what document?

*Condensed descriptions an appendix which will be in an OFR due out Spring 85. OFR will describe P-1.*

Reviewer Cutler  
Date 9/17

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

VE25P-1, Dolomite Core Interval

2. When were the above data collected?

3. Who collected the data?

Recco for USGS

4. Where is the data stored?

Mercury-Core Library

5. What was the objective or purpose of the survey?

To obtain Paleozoic core

6. What parameters were determined? What features were mapped or logged?

Core Hydro & Geol & Rock Mech tests

Reviewer Cutler  
Date 9/17

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

4297.9' - 4368.2'

8. How much data were collected (number of samples/traverses, etc)?

Almost continuous Paleozoic section.

Selected intervals cored

< 5% of total core, mostly in

9. What methods, procedures, or techniques were used in gathering the data?

Std. - Could have gotten more core -  
core ~~not~~ logged on well site.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

✓ Interval QA

11. When are the data to be published? In what publication series? If already published when and in what document?

Not pub - should be in  
several mos.

Reviewer D. Tikhonik  
D. Gupta

Date 9/18/84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

USG-4 core

2. When were the above data collected?

1983

3. Who collected the data?

USGS

4. Where is the data stored?

Core Library

5. What was the objective or purpose of the survey?

To investigate the lithology of the repository block to be used as principle borehole for the exploratory.

6. What parameters were determined? What features were mapped or logged?

Lithology

D. TIKTINSKY  
Reviewer D. L. UPTON

Date 1/18/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

3000ft

8. How much data were collected (number of samples/traverses, etc)?

Core

9. What methods, procedures, or techniques were used in gathering the data?

Coring

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Yes

11. When are the data to be published? In what publication series? If already published when and in what document?

2-3 months report on USW64

David Tikinsky  
Reviewer Dinesh Gupta

Date - 9/18/84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

VE25h # L Horizontal hole to evaluate  
dry coring technology

2. When were the above data collected?

horizontal coring from the surface

3. Who collected the data?

USGS

4. Where is the data stored?

Core library

5. What was the objective or purpose of the survey?

to test dry horizontal coring

6. What parameters were determined? What features were mapped or logged?

feasibility of dry coring technology

D. TILAKI  
Reviewer D. GUPTA

Date 9/18/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

400 ft horizontal

8. How much data were collected (number of samples/traverses, etc)?

400 ft

9. What methods, procedures, or techniques were used in gathering the data?

horizontal core drilling

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Yes, core pictures

11. When are the data to be published? In what publication series? If already published when and in what document?

We will be receiving a copy of the core photographs

12. Remarks -

The core shows a great deal of graveling, it is difficult to tell whether the rock is this badly broken up or the dry coring caused the breakage.

Reviewer S. Olney

Date 9/18/84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?  
CORE - USW G-2 (T.D. 1830.4 meters)
2. When were the above data collected?  
March 25 - October 11, 1981
3. Who collected the data? USGS (Drilling by Fenix + Seiscon Inc.)
4. Where is the data stored? AT NTS - CORE LIBRARY  
BUILDING: 158
5. What was the objective or purpose of the survey?  
\* TO CHARACTERIZE ROCK MASSES AT YUCCA MT.  
PARTICULARLY ON THE STRATIGRAPHY  
FRACTURE ANALYSIS  
FAULT ZONE DATA  
LITHOPHYSICS.
6. What parameters were determined? What features were mapped or logged?  
Geophysical logs (Birdwell Division of Seismograph Corporation)  
caliper, density, electric, velocity, temperature, neutron, gamma ray  
and televiwer  
Directional survey  
X-RAY DIFFRACTION ANALYSIS  
FRACTURE DATA  
PETROGRAPHIC ANALYSIS

4869.5 - 4948.5  
4868.7 - 4982.0  
BEDDED ASH-FLOW TUFF  
LAVA AND FLOW BRECCIA

Reviewer S. Olney  
Date 9/19/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?  
1525.8' → 1654.8', PAINT BRUSH TUFF (~~IN~~ TOPOPAH SPRINGS MEMBER)  
1672.8' → 1736.4'  
2673.7' → 2730.2' TRAVOLITE LAVAS + TUFFS OF CALICO HILLS  
TRIFACEDUS BEDS OF CALICO HILLS  
PROW PASS MEMBERT (starting at 2707.6')
- Nevada State Coordinates: N. 237,385 m.  
GROUND ELEVATION 1554 m. E 170,841 m.
8. How much data were collected (number of samples/traverses, etc)?  
41 BOXES (BOX 143 → 158 ; 161 - 168 ; 279 → 285)  
(BOX 528 - 535 ; 537 - 538)

9. What methods, procedures, or techniques were used in gathering the data?  
CONTINUOUS CORING  
Standard procedures  
wireline coring

10. Are the methods, procedures, or techniques under which the data were gathered documented?  
Yes - QA procedures

11. When are the data to be published? In what publication series? If already published when and in what document?  
MALDONADO, F, and Koether S.L., 1983, STRATIGRAPHY, STRUCTURE, AND SOME PETROGRAPHIC FEATURES OF TERTIARY ROCKS AT THE USW G-2 DRILL HOLE, YACLA MOUNTAIN, IUBE COUNTY, NEVADA. O-FR 83-732 USGS, DENVER, COLORADO.

Reviewer

J. Cutler

Date

9/19/84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Field mapping done by Bob Scott

2. When were the above data collected?

Between 1951 & 1954

3. Who collected the data?

Bob Scott, U.S.G.S.

4. Where is the data stored?

Scott personally retains field notes  
etc.

5. What was the objective or purpose of the survey?

To map the geology of Fucca Pt.

6. What parameters were determined? What features were mapped or logged?

Stratigraphy, Faults + Fractures, etc.

Reviewer Culler  
Date 9/19/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

Four localities digitized: all contained beds between Busted Butte + Yucca Mtn. (3 strike slip (normal) faults on NE slope of Yucca Mtn. + faulting + slumping on N slope of Y. Mtn.)

8. How much data were collected (number of samples/traverses, etc)?

"Pavement" mapped by Chris Barton of USGS. Detailed geologic mapping done by Scott in C, E + D above. Barton mapped several "pavements" for tectonic and cooling fractures near G4 (well)

9. What methods, procedures, or techniques were used in gathering the data?

Std. field mapping by Scott (A, B, C + E). Detailed small scale fracture mapping by Barton on pavements near well G4.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Barton is soon to publish his pavement study, which is unique. Scott's mapping proc. was std.

11. When are the data to be published? In what publication series? If already published when and in what document?

Scott's map - CFR - 84 - 494

Barton's pavement work to be presented at 1984 GSA - in Reno, NV

Reviewer Cutler  
Date 9/25/84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?  
Line length (geodetic) data used to determine infinitesimal strain rates in the area around NTS.
  
2. When were the above data collected?  
Early 1970's, five surveys, at Pahute Mesa, Yucca Flat and Shoshone.  
Shoshone area repeated 1984. (This is the Yucca Mtn area.)
  
3. Who collected the data?  
W. Prescott
  
  
4. Where is the data stored?  
Menlo Park - Prescott's Office
  
  
5. What was the objective or purpose of the survey?  
study crustal deformation rates.
  
  
6. What parameters were determined? What features were mapped or logged?  
Relative changes in line length used to determine inf. strain ellipsoid.

Reviewer Cutler  
Date 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

W - Bare Mtn  
S - Lathrop Wells  
E - Frenchman Flat  
N - Gold Flat

8. How much data were collected (number of samples/traverses, etc)?

12 stations in Yucca Mtn Area  
25 Total  
Early surveys in Pahute Mesa Only  
Later (80's) surveys extended to Yucca Mtn.

9. What methods, procedures, or techniques were used in gathering the data?

Relative line lengths measured by geodolite.  
Temperatures recorded by aircraft flying  
line of site.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Data analysis <sup>and collection</sup> procedure described in pub.  
- Savage + Prescott, J.G.R., 1973.  
Computer code with actual calculation procedures  
is heavily ~~documented~~ but not documented.  
commented

11. When are the data to be published? In what publication series? If already published when and in what document?

Prelim. data analysis compiled, will be  
requested.

Reviewer J Cutler

Date 9/17/84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Core from USW-GV3  
wedded 1091' to 1199.5' - Interval, depth from ground surface  
1364' to 1421.4' - Unwedded

2. When were the above data collected?

3. Who collected the data?

~~Reeco~~ Reeco - Cored hole  
for USGS

4. Where is the data stored?

NNWSI Core Library - Mercury

5. What was the objective or purpose of the survey?

Strat + structural studies

6. What parameters were determined? What features were mapped or logged?

General invest. of rock mech.  
and geol.

Reviewer Cutler  
Date 9/17/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

See #1  
Upper interval is Topopah  
Lower interval non-welded tuff

8. How much data were collected (number of samples/traverses, etc)?

Complete Core  
~90% recovery

9. What methods, procedures, or techniques were used in gathering the data?

Wireline method

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Std. methods, except no core logging done on the well site, all back in the lab.

11. When are the data to be published? In what publication series? If already published when and in what document?

Report to be pub. by VSGS in several months

Reviewer J. H. ...

Date Sept 17 1980

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

SD Velocity Log, Hole USW-61, Elev 4349

2. When were the above data collected?

12 Aug 1980

3. Who collected the data?

C. J. ... FOR DOE

4. Where is the data stored?

SDI Data Library

5. What was the objective or purpose of the survey?

~~...~~ DETERMINE VELOCITY ...

6. What parameters were determined? What features were mapped or logged?

... CT → CR = 38"

Reviewer IMSE/MURPHY

Date SEPT 17, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

NOT DETERMINED

8. How much data were collected (number of samples/traverses, etc)?

NOT DETERMINED

9. What methods, procedures, or techniques were used in gathering the data?

BIRDWELL ID TECH.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

YES, NOTED ON FIELD RECORDINGS

11. When are the data to be published? In what publication series? If already published when and in what document?

UNKNOWN

Reviewer C. Moore

Date 9-17-84

**GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST**

1. What is the name/type of survey/test/analysis/map/core?

U.S.G. 6-1 / Core / 2" core with down hole direction  
and footage marked. Spacing out: 1189.7 - 1291.1 ft  
1351.6 - 1415.6 ft  
1971.3 - 2027.7 ft

2. When were the above data collected?

Date: March to August 1980

Topopah Springs

3. Who collected the data?

- Fred - Drilled
- Fred - Cores - Logging, who supervised
- U.S.G. supervised

4. Where is the data stored?

U.S.G. core library at NIS

5. What was the objective or purpose of the survey?

Physical description of rock structure

6. What parameters were determined? What features were mapped or logged?

Variety of ~~stratigraphic~~ structural features. Refer to OFR 81-1349

Reviewer C. GLENN

Date 9-17-84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

*Area drilled total 1 mi x 1/2 mi  
land from 292 ft to 6000 ft*

8. How much data were collected (number of samples/traverses, etc)?

*Refer to OFR 81-1349*

9. What methods, procedures, or techniques were used in gathering the data?

*Standard procedures for geophysical surveys  
used in the area. The survey was conducted  
in accordance with the procedures set forth  
in the OFR 81-1349.*

10. Are the methods, procedures, or techniques under which the data were gathered documented?

*yes, see above.*

11. When are the data to be published? In what publication series? If already published when and in what document?

*Structure of Sol. Rho in Brill Hole US 76-61  
OFR 81-1349  
published*

Reviewer

Cutler

Date

9/17

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Pavement Study  
Pavements made by mechanically stripping cover.

2. When were the above data collected?

Pavements made Oct. 1983  
studied in 1984

3. Who collected the data?

Chris Barton

4. Where is the data stored?

Mercury - Core Library

5. What was the objective or purpose of the survey?

To characterize fractures in Yucca Mtn.  
block.

6. What parameters were determined? What features were mapped or logged?

Fractures mapped in detail  
over  $\sim 300 \text{ m}^2$  area

Reviewer Cutler  
Date 9/17

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

several "pavements" ~ 300 m<sup>2</sup> each  
in Yucca Mtn block.

8. How much data were collected (number of samples/traverses, etc)?

3 or 4 pavements mapped in detail

9. What methods, procedures, or techniques were used in gathering the data?

Mechanical stripping of cover, expose  
~ 300 m<sup>2</sup> of "pavement", map fractures.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

They are new.

11. When are the data to be published? In what publication series? If already published when and in what document?

To be published as an  
abstract 1984 GSA Annual  
meeting.

Reviewer JAMES J. HURRY

Date 9/17/84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

3D VELOCITY, HOLE G03

2. When were the above data collected?

APRIL 30, 1982

3. Who collected the data?

SC. BROWN

4. Where is the data stored?

SC. BROWN

5. What was the objective or purpose of the survey?

DETERMINE VELOCITY IN CORES

6. What parameters were determined? What features were mapped or logged?

TRAVEL TIME CT-CR - 0.02

Reviewer IMSE/MURPHY

Date 9/17/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

NOT DOCUMENTED

8. How much data were collected (number of samples/traverses, etc)?

NOT DOCUMENTED

9. What methods, procedures, or techniques were used in gathering the data?

NOT DOCUMENTED

10. Are the methods, procedures, or techniques under which the data were gathered documented?

YES NOTED IN FILE

11. When are the data to be published? In what publication series? If already published when and in what document?

Reviewer RICE / IMSE

Date 9/25/84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

SEISMIC REFRACTION SURVEYS

2. When were the above data collected?

DURING FY 1983 & 1984

3. Who collected the data?

U.S.G.S. UNDER DIRECTION OF WALT MOONEY

4. Where is the data stored?

MENLO PARK, BLDG E, ROOM 8175

5. What was the objective or purpose of the survey?

INTERMEDIATE CRUSTAL STRUCTURE  $\approx$  2-4 KILOMETERS DEEP

6. What parameters were determined? What features were mapped or logged?

SHALLOW CRUSTAL LAYERING IN CRATER FLAT / AMARCOOSA VALLEY  
REGION

Reviewer RICE / IMSE

Date 9/25/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

E-W LINE FROM DEATH VALLEY MONUMENT ON WEST TO <sup>W.</sup> FLANK OF  
YUCCA Mtn N-S LINE ALONG EASTERN MARGIN OF CRATER FLAT

8. How much data were collected (number of samples/traverses, etc)?

≈ 6 SPREADS

9. What methods, procedures, or techniques were used in gathering the data?

200' SHOTHOLES, 2000 + 4000 LBS OF EXPLOSIVES PER, TELEMETERED  
RECORDERS @ 300 M BETWEEN SENSORS, SHOTS AT 7 KN INTERVALS

10. Are the methods, procedures, or techniques under which the data were gathered documented?

DATA REPORTED IN OFR 84-661

TECHNIQUES REPORTED IN EARLIER MAP FROM SAUDI ARABIA  
STUDIES

11. When are the data to be published? In what publication series? If already published when and in what document?

DATA IN 84-661

INTERPRETATION DUE IN OFR YET TO BE REVIEWED

Reviewer D. Gault/W. Tamm

Date Sept 20 1984

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

For acoustic tests on Buildings and  
Tobacco <sup>cell</sup> members supplied by Lawrence  
University

2. When were the above data collected?

8/20 through 2/84

3. Who collected the data?

USGS

4. Where is the data stored?

USGS, Menlo Park

5. What was the objective or purpose of the survey?

To determine permeability of rocks  
from Buildings and Tobacco member samples  
(outcrops)

6. What parameters were determined? What features were mapped or logged?

permeability data

Reviewer D. Gupta / N. Taniou

Date Sept 25, 84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

Outcropping samples collected to 100 m by  
hand in the area of study.

8. How much data were collected (number of samples/traverses, etc)?

in tests [ 2 rock types - 3 tests as  
balling and 7 tests as tabular ]

9. What methods, procedures, or techniques were used in gathering the data?

Hand collected samples

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Yes

11. When are the data to be published? In what publication series? If already published when and in what document?

Some of the data has been published.

Reviewer D. Gupta / N. Tanius

Date 1-1-85

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Stress-Strain curves on Bullfinch  
member. <sup>Thin</sup> samples collected by USGS  
Laboratory.

2. When were the above data collected?

3/83 through 9/83

3. Who collected the data?

USGS

4. Where is the data stored?

USGS, Menlo Park

5. What was the objective or purpose of the survey?

To determine strength of rocks from Bullfinch and  
related member samples (retrieving)

6. What parameters were determined? What features were mapped or logged?

Stress-Strain relationship

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

Outcrops of ... samples subjected to ...  
... ..

8. How much data were collected (number of samples/traverses, etc)?

↳ tests [ 2 rock types  
2 sites: 10<sup>4</sup> & 10<sup>6</sup>  
Direct samples + saw cut samples  
E ... ]

9. What methods, procedures, or techniques were used in gathering the data?

... ..

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Yes

11. When are the data to be published? In what publication series? If already published when and in what document?

Some of it has been published, e.g.  
Frictional sliding and fracture behavior of some  
MTS Tuffs by Morrow and Byerlee, Proc. 25<sup>th</sup>  
... .. June 1984

Reviewer RICE/MURPHY/IMSE

Date SEPT 26, 1984

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

SEISMIC REFRACTION AND REFLECTION

2. When were the above data collected?

APRIL 83 - REFRACTION

SUMMER 82 - REFLECTION

3. Who collected the data?

HANS ACKERMAN FOR THE REFRACTION DATA

SEISDATA FOR DOE FOR THE REFLECTION DATA

4. Where is the data stored?

USGS - DENVER WEST BLDG. II, ROOM 125

5. What was the objective or purpose of the survey?

TESTING ~~REFRACTION~~ TECHNIQUE AND RECONNAISSANCE  
FOR THE REFLECTION SURVEY — LITHOLOGIC AND  
STRUCTURAL DETERMINATION FOR THE REFRACTION

6. What parameters were determined? What features were mapped or logged?

NONE FOR REFLECTION — DOCUMENTATION OF  
VARIABILITY IN THE VELOCITY STRUCTURE OF INDIVIDUAL  
UNITS FOR THE REFRACTION SURVEY

Reviewer RICE/MURPHY/IMSE

Date SEPT 26, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?  
DRILLHOLE WASH AND SPLIT WASH(?) AND A NORTH-SOUTH  
RUNNING IN MIDWAY VALLEY — REFLECTION SURVEY  
EAST-WEST LINE FROM FRAN RIDGE TO THE EASTERN  
EDGE OF YUCA MT. — REFRACTION SURVEY
8. How much data were collected (number of samples/traverses, etc)?

SEE OPEN-FILE-REPORTS

9. What methods, procedures, or techniques were used in gathering the data?  
REFLECTION — 3D SURVEY WITH PRIMACORD SOURCE  
REFRACTION — DYNAMITE 2400' SPREADS  
ENDS AND CENTER SHOTS
10. Are the methods, procedures, or techniques under which the data were gathered documented?

YES, SEE NO. 8

11. When are the data to be published? In what publication series? If already published when and in what document?

REFLECTION — ?

REFRACTION — IN REVIEW AT SANDIA (MAY BE  
PUBLISHED AS AN OFC)

Reviewer RICE / IMSE

Date SEPT. 26, 1984

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

GEOPHYSICAL BOREHOLE LOGS FOR WELL G1

2. When were the above data collected?

1980

3. Who collected the data?

BIRDWELL / DRESSER-ATLAS FOR DOE

4. Where is the data stored?

USGS, DENVER WEST, BLDG II, ROOM 112

5. What was the objective or purpose of the survey?

GEOPHYSICAL / LITHOLOGIC PROPERTIES OF THE ROCKS IN G1

6. What parameters were determined? What features were mapped or logged?

CALIPER, DENSITY, RADIOACTIVE TRACER, POROSITY, ELECTRIC, GAMMA-NEUTRON, 3D VELOCITY, AND LITHOLOGIC LOGS

Reviewer RICE/IMSE

Date SEPT 26, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

G1 WELL

8. How much data were collected (number of samples/traverses, etc)?

MOST SURVEYS WERE CONDUCTED IN OVER-LAPPING  
INTERVAL TO COMPLETE DEPTH

9. What methods, procedures, or techniques were used in gathering the data?

BIRDWELL OR DRESSER-ATLAS STANDARD PROCEDURES

10. Are the methods, procedures, or techniques under which the data were gathered documented?

YES

11. When are the data to be published? In what publication series? If already published when and in what document?

OPR 83-321

BY MULLER AND KIBLER

;

OPK 83-401

BY ELLIS AND SWOLFS

Reviewer RICE /IMSE

Date SEPT 26, 1984

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

BOREHOLE GRAVITY SURVEY - 3 HOLES (UE25p-1,  
UE25c-1, AND G-3)

2. When were the above data collected?

NOVEMBER 1983

3. Who collected the data?

USGS (DON HEALY)

4. Where is the data stored?

USGS DENVER WEST, BLDG. II, ROOM 112

5. What was the objective or purpose of the survey?

DENSITY DETERMINATIONS (INTERVALS) DOWN HOLE

6. What parameters were determined? What features were mapped or logged?

INTERVAL GRAVITY MEASUREMENTS → DENSITIES

Reviewer RICE/IMSE

Date SEPT 26, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

FROM NEARLY THE SURFACE TO TOTAL DEPTH  
IN EACH HOLE

8. How much data were collected (number of samples/traverses, etc)?

LOGS FOR VE25p-1, VE25a-1, AND G3

9. What methods, procedures, or techniques were used in gathering the data?

STANDARD BOREHOLE SURVEY USING LACOSTE-ROMBERG  
GRAMMETER — FREE-AIR GRADIENT SURVEYS FOR  
EACH HOLE

10. Are the methods, procedures, or techniques under which the data were gathered documented?

YES, SEE NO. 11

11. When are the data to be published? In what publication series? If already published when and in what document?

DOCUMENT IN PRINTING (84-672) — WILL BE  
AVAILABLE SOON

Reviewer TAPP

Date 26 Sep 84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

TRENCH MAPS Betty fault BF14BF2

FIELD MAP TRENCH 14

AIR PHOTOS OF TRENCH AREA CF-2 & CF-3

(500, 501 & 502)

IN CONNECTION WITH  
MAPPING OF UNCONSOLIDATED  
MATERIALS

2. When were the above data collected?

LAST FEW YEARS UP TO PRESENT

(IN COLLECTION ~~OF~~)

COMPILATION ETC STAGE

(PHOTOS 78499 TIME FRAME)

3. Who collected the data?

W. C. SWADLEY

4. Where is the data stored?

W. C. SWADLEY OFFICE

5. What was the objective or purpose of the survey?

DATE FAULT MOVEMENT

6. What parameters were determined? What features were mapped or logged?

SOIL HORIZONS

STRATIGRAPHIC HORIZONS

FAULTS & FRACTURES

& ASSOCIATED FILLING FEATURES

Reviewer TRAPP

Date 26 SEP 84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

TRENCH WALLS FROM SURFACE TO  
BASE OF TRENCH  $\approx$  2 meters DEEP X  
20-30 meters LONG

8. How much data were collected (number of samples/traverses, etc)?

MAP OF ONE WALL OF EACH TRENCH  
IN BATTERY TRENCH SAMPLES FOR C<sup>14</sup>  
& U TRAND DATING

9. What methods, procedures, or techniques were used in gathering the data?

AREA WAS GRIDDED & MAPPED, OTHER  
PEOPLE WERE CONSULTED TO OTHER AREA  
MAPPED IE SOIL SCIENTIST & SOIL  
STRATIGRAPHERS

10. Are the methods, procedures, or techniques under which the data were gathered documented? ~~NO~~

THIS INFORMATION IS IN FIELD NOTE BOOKS

11. When are the data to be published? In what publication series? If already published when and in what document?

PLAN ON MF SERIES PROBABLY 6-12 MONTHS  
MAY BE OPEN FILE

Reviewer RUS PURCELL

Date 26 SEPT 84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Surficial deposits maps of the four quads surrounding Yucca Mtn.

Climatic data for the Great Basin.

2. When were the above data collected?

1981 - 1984.

3. Who collected the data?

Dub Swadley, Dave Hoover and assistants.  
↑ Will Carr

4. Where is the data stored?

Offices of Dave Hoover. Denver West Bldg 2.

5. What was the objective or purpose of the survey?

To map the surficial deposits at the Nevada Test Site to help in the evaluation of the Quaternary as it relates to the possible repository site.

6. What parameters were determined? What features were mapped or logged?

Quaternary stratigraphic units with associated soils were field mapped. Climatic data collected and compiled from various stations throughout the Great Basin.

Reviewer RUS PURCELL

Date 26 SEPT 84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?  
The four topographic quadrangles surrounding Yucca Mtn.  
Maximum depth limited to the greatest topographic relief in exposed arroyo walls and the trench excavations.
8. How much data were collected (number of samples/traverses, etc)?  
Surficial deposits mapped on aerial photographs and in the field. 4 quadrangles covered. No samples applicable.  
Over 200 stations sampled for climatic data.
9. What methods, procedures, or techniques were used in gathering the data?  
Straight field mapping with aerial photographs, topographic maps and conversions with analytical plotters onto final topographic base.  
Climatic data collected from existing records. Some extending back into the 1930's.
10. Are the methods, procedures, or techniques under which the data were gathered documented?  
Theoretically on aerial photographs, topographic maps and field notebooks.
11. When are the data to be published? In what publication series? If already published when and in what document?  
May be published open-file in the next 6 months.

Reviewer T. J. Schmitt

Date 9-26-84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?  
Operation of Seismic Network
  
2. When were the above data collected?  
Present networks ~~begin~~ began operation in Aug 78 and was  
in full operation in Aug. 79
  
3. Who collected the data?  
USGS. Branch of F
  
4. Where is the data stored?  
USGS Golden Colo, and USGS Warehouse.
  
5. What was the objective or purpose of the survey?  
~~Determine~~ Determine seismic activity of NTS and  
region within 150km. of NTS.  
55 seismo
  
6. What parameters were determined? What features were mapped or logged?  
Amplitude + Time of seismic arrival of earthquakes at  
stations. Vertical motion only

Reviewer T. J. Schmitt

Date 26-9-84,

7. What are the spatial bounds of the survey (area surveyed, to what depth)?  
150 km radius of NTS

8. How much data were collected (number of samples/traverses, etc)?  
55 stations,  $\approx$  3000 events in last 4 years.

9. What methods, procedures, or techniques were used in gathering the data?  
Short period instruments. Gain 500  $\rightarrow$  1,000 K. Transported to Golden Colo. Recorded on Velocorder and converted to Digital data format at same time (Backup). Digital data is recorded if there is an earthquake.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

Computer programs are documented.  
Machines are routinely calibrated, 4x year.  
Network is operated under procedures developed by U.S.G.S. for their global, regional, and local networks.  
Considerable number of the procedures are documented in QA procedures.

11. When are the data to be published? In what publication series? If already published when and in what document?

Open file reports 81-1086

Reviewer MEKAGUE

Date 9/26/84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

EPIC EARTHQUAKE SEISMOLOGY

2. When were the above data collected?

CONTINUOUSLY SINCE 1978, BUT WITH  
INTERMITTENT DATA FROM 1978 TO 2001  
AND 2002 TO 2003.

3. Who collected the data?

U.S. GEOLOGICAL SURVEY - EARTHQUAKE  
GEOLOGY AND GEOPHYSICS BRANCH  
3450 GARDEN AVENUE  
GOLDEN, COLORADO 80401

4. Where is the data stored?

U.S. GEOLOGICAL SURVEY  
1711 ILLINOIS  
RM 436  
GOLDEN, COLORADO

5. What was the objective or purpose of the survey?

LOCATION OF EARTHQUAKES WITH  
RESPECT TO LOCAL TECTONIC DETERMINATION  
OF MAGNITUDE

6. What parameters were determined? What features were mapped or logged?

- 1. EVENT TIME
- 2. MAGNITUDE
- 3. FOCAL MECHANISMS

Reviewer

Date

9/20/80

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

DATA TAKEN WITHIN 150 KM 1200M  
OF COCCA MOUNTAIN.

8. How much data were collected (number of samples/traverses, etc)?

DATA COLLECTED CONTINUOUSLY  
FROM 1978 TO 1978.  
ESTIMATED TO BE 10000  
COLLECTED

9. What methods, procedures, or techniques were used in gathering the data?

STANDARD  
• DISTANCE  
• DATA TAKEN BY  
TECHNICAL STAFF

10. Are the methods, procedures, or techniques under which the data were gathered documented?

STANDARD  
• CONTINUOUS PDP 11/34  
• RECORDING ON TAPE  
DEVELOPER  
• SOME

11. When are the data to be published? In what publication series? If already published when and in what document?

ALREADY  
DATA P210181 - USGS OF 2 31 1086  
DATA 1981 - USGS OF 2 23-669

TO BE PUBLISHED  
• DATA 1982-83 - WITHIN  
• DATA ON EASTERN RANGE  
ATTENUATION - WITHIN SIX MONTHS

Reviewer C. Glenn

Date 9-26-84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis (map/core)?

a) Preliminary Geologic Map of Yucca Mountain  
Scale 1:12,000; Contour Interval 20 ft

c) Air photos: # 86  
802, 863, 771, 312  
+ 253

Scale 1:12,000

Photos shot Sept. 1973

b) Cross Section key to geologic map of Yucca Mt.

2. When were the above data collected?

1981 - 1984

3. Who collected the data?

Bob Scott

4. Where is the data stored?

USGS; Denver, Colorado

5. What was the objective or purpose of the survey?

To develop a detailed geologic map for potential repository.

6. What parameters were determined? What features were mapped or logged?

Mapped stratigraphic and structural features.

Reviewer C. Glenn  
Date 9-26-84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

Long.  $116^{\circ} 30'$  to  $116^{\circ} 22' 30''$   
Lat.  $36^{\circ} 48'$  to  $36^{\circ} 56'$

8. How much data were collected (number of samples/traverses, etc)?

Three years of field data

9. What methods, procedures, or techniques were used in gathering the data?

Mapped contacts of stratigraphic units and structural features onto air photos. This information was then transferred to a topographic base map and field checked. Map then subject to several levels of in-house review prior to publication

10. Are the methods, procedures, or techniques under which the data were gathered documented?

yes, methods used to develop map are documented in field note books used by investigator.

11. When are the data to be published? In what publication series? If already published when and in what document?

Preliminary Geologic Map published # OFR 84-494  
Interpretive synthesis of geologic map to be published in approximately one year.

Reviewer RICE

Date SEPT. 27, 1984

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

MATERIAL PROPERTIES OF CORE SAMPLES FROM:  
VE25a-1, VE25p-1, USN G-3, AND USN G4  
(SEVERAL OTHER SHALLOW WELLS)

2. When were the above data collected?

LAST 3 YEARS

3. Who collected the data?

LEMMERT ANDERSON, USGS

4. Where is the data stored?

USGS, DENVER WEST, BLDG. II, ROOM 119

5. What was the objective or purpose of the survey?

IDENTIFY ACTUAL ROCK PETROPHYSICAL PROPERTIES FOR  
SEVERAL BOREHOLES — RESULTS ARE DISTRIBUTED  
TO VARIOUS OTHER INVESTIGATORS FOR

6. What parameters were determined? What features were mapped or logged?

RESISTIVITY, INDUCED POLARIZATION, SATURATED/UNSATURATED  
DENSITIES, SONIC VELOCITIES, MAG. PROPERTIES, AND  
POROSITY/PERMEABILITY.

Reviewer RICE

Date SEPT. 27, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

VARIOUS SAMPLES FROM EACH OF THE WELLS BASED ON CORE QUALITY AND GEOLOGIST REQUESTS FOR INFORMATION

8. How much data were collected (number of samples/traverses, etc)?

SEE #7

9. What methods, procedures, or techniques were used in gathering the data?

IN OFR 84-552, THE TECHNIQUES AND PROCEDURES ARE DESCRIBED — CONSIDERED TO BE COMMONLY USED METHODS FOR DETERMINING THESE ROCK PROPERTIES

10. Are the methods, procedures, or techniques under which the data were gathered documented?

YES, OFR 84-552

11. When are the data to be published? In what publication series? If already published when and in what document?

JGR PREPRINT AVAILABLE MARCH 85  
OFR 84-552 IS READY FOR PRINTING

Reviewer Rus Puncell

Date 27 Sept 84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?  
*Geology of the Beatty Fault by Lynn Parrish. Report on trenching and slope profiles on the Beatty Fault.*
2. When were the above data collected?  
*~1981*
3. Who collected the data?  
*Lynn Parrish and Arthur J. Gordon*
4. Where is the data stored?  
*Beatty Fault File of Will Con.*
5. What was the objective or purpose of the survey?  
*To characterize the Beatty Fault and suggest a date age for the most recent movement.*
6. What parameters were determined? What features were mapped or logged?  
*Quaternary stratigraphic units and soils were mapped. ~~Trench logs~~ and slope profile measurements taken.*

Reviewer Rus Purcell

Date 27 Sept. 84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?  
*Direct area surrounding the Beatty Fault. Minimal depth in trenches.*
  
8. How much data were collected (number of samples/traverses, etc)?  
*Approximately 25 slope angle measurements were made.*
  
9. What methods, procedures, or techniques were used in gathering the data?  
*The slope measurements were applied to Wallace's (1977) relationships concerning correlation between slope angle and scarp age. Slope measurements were made with a stick and clinometer.*
  
10. Are the methods, procedures, or techniques under which the data were gathered documented?  
*Yes. In the typed reports.*
  
11. When are the data to be published? In what publication series? If already published when and in what document?  
*Not intended to be published.*

Reviewer RICE

Date SEPT. 27, 1984

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

REMNANT MAGNETIZATION OF CORE SAMPLES  
FROM G1, G2, G3, AND SEVERAL SURFACE LOCATIONS

2. When were the above data collected?

1980 - 83

3. Who collected the data?

JOE ROSENBAUM, USGS

4. Where is the data stored?

USGS, DENVER WEST, BLDG. II, ROOM 120

5. What was the objective or purpose of the survey?

STRATIGRAPHIC / STRUCTURAL INTERPRETATIONS AND  
INPUT DATA TO THE AEROMAGNETIC ANOMALY INTERPRETATIONS

6. What parameters were determined? What features were mapped or logged?

ORIENTATION AND MAGNITUDE OF THE MAGNETIC  
VECTOR FROM SPECIFIC UNITS WITHIN CORES

Reviewer RICE

Date SEPT. 27, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

SAMPLES EVERY FIVE FEET FROM EACH WELL  
FROM AVAILABLE CORE

8. How much data were collected (number of samples/traverses, etc)?

FROM SURFACE TO T.D. IN EACH WELL WHERE  
CORE WAS AVAILABLE

9. What methods, procedures, or techniques were used in gathering the data?

STANDARD EXPERIMENTAL MEASURING TECHNIQUES

10. Are the methods, procedures, or techniques under which the data were gathered documented?

~~PROCEDURES~~ PROCEDURES ARE DOCUMENTED IN  
IN THE RESULTS OF MEASURING STEPS  
CONDUCTED

11. When are the data to be published? In what publication series? If already published when and in what document?

OFFR TO BE PUBLISHING IN THE NEXT FEW  
MONTHS (CONTAINS MOSTLY DATA - SOME  
INTERPRETATION)

Reviewer MSKAGUE

Date 9/27/84

**GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST**

1. What is the name/type of survey/test/analysis/map/core?

CONDUCTING SURVEY - LATE ORATEL...  
FAULT SYSTEM, CALIFORNIA...  
... ..

2. When were the above data collected?

1969-1979

3. Who collected the data?

4. Where is the data stored?

... ..  
... ..

5. What was the objective or purpose of the survey?

OBJECTIVE... ..  
... ..  
... ..

6. What parameters were determined? What features were mapped or logged?

1. FAULT SEGMENT ...
2. FAULT SEGMENT ...
3. ...
4. ...
5. ...

Reviewer MS KAGUE

Date 9/27/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

UNIVERSITY OF CALIFORNIA, SAN DIEGO  
JALISCO - CALIFORNIA  
WATER QUALITY MONITORING SURVEY  
1984

8. How much data were collected (number of samples/traverses, etc)?

LOWE, BRADY, AND  
1984

9. What methods, procedures, or techniques were used in gathering the data?

10. Are the methods, procedures, or techniques under which the data were gathered documented?

11. When are the data to be published? In what publication series? If already published when and in what document?

UNIVERSITY OF CALIFORNIA, SAN DIEGO  
JALISCO - CALIFORNIA  
WATER QUALITY MONITORING SURVEY  
1984

Reviewer TRAPID

Date 27 SEPT 84

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

VH-2 DRILL HOLE - GAITHERIA, HAND COPY MANUSCRIPTS  
DAILY DRILLING REPORTS, SUMMARY OF LOGS AND CONTACTS  
SAMPLE DESCRIPTIONS CORE PHOTOS.

2. When were the above data collected?

FEB, MARCH, APRIL 83

3. Who collected the data?

FENIX & SOISSON, W. CRAIG

4. Where is the data stored?

W. CRAIG OFFICE

5. What was the objective or purpose of the survey?

DETERMINE STRATIGRAPHY & GEOLOGY  
CORRELATE WITH AREA

6. What parameters were determined? What features were mapped or logged?

FORMATION BOUNDARIES, PRIMARY

Reviewer TRAPP

Date 27 sept 84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

4000 27 (BULLHOG)

8. How much data were collected (number of samples/traverses, etc)?

CONTINUOUS CORE

9. What methods, procedures, or techniques were used in gathering the data?

STANDARD DRILLING YHOOPING

10. Are the methods, procedures, or techniques under which the data were gathered documented?

YES  
~~NO~~ DR LOGS, DAILY RECORDS, PHOTOS  
ETC

11. When are the data to be published? In what publication series? If already published when and in what document?

OPEN FILE 6-12 MONTHS

Reviewer Rus Puncell

Date 27 Sept 84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?  
Yucca Mtn. Level line and Quadrilaterals on 4 faults  
HP 3805A level.
2. When were the above data collected?  
Installed in spring of 1983. Measured in the spring  
of 1983 and winter of 1984.
3. Who collected the data?  
Tom Bray
4. Where is the data stored?  
Building 25, Denver Federal Center, Tom Bray
5. What was the objective or purpose of the survey?  
Evaluating ground movement across Yucca Mtn and  
selected faults on each side of Yucca Mtn.
6. What parameters were determined? What features were mapped or logged?  
Elevations of data points. Can determine vertical  
changes along the level line. Possibly some horizontal  
changes but less likely as you go nearer the ends  
of the line. The quadrilaterals can measure both  
vertical and horizontal changes.

Reviewer Rus Purcell

Date 27 Sept 84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?  
*Accuracy of the survey is approximately to within about 6mm.*
  
8. How much data were collected (number of samples/traverses, etc)?  
*Two surveys have been made so far. (2 year record)*
  
9. What methods, procedures, or techniques were used in gathering the data?  
*Leveling and vertical angle checks. Standard procedures used by NGS.*
  
10. Are the methods, procedures, or techniques under which the data were gathered documented?  
*Methods and procedures are documented in an inhouse document. Same as standard NGS 1<sup>st</sup> order surveys.*
  
11. When are the data to be published? In what publication series? If already published when and in what document?  
*None of the data is published. At present there is no intention to publish the data.*

Reviewer C. Glenn

Date 9-27-84

### GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?

Isotopes - age sample data. Data file includes a binder containing 8 1/2 x 11" individual top map sheets spotting the location where each sample was collected.

2. When were the above data collected?

Sample collection and analysis spans a period from late 1970's through early 80's.

3. Who collected the data?

W. Carr, other investigators or field assistants

4. Where is the data stored?

This file stored ~~in~~ U.S.G.S Denver West Bldg. # III, Room 36

5. What was the objective or purpose of the survey?

Establish age of key samples to determine age of lithologic unit or related structural features noted in field.

6. What parameters were determined? What features were mapped or logged?

Sample Information Sheet - Fission Track describes: location from which sample was taken; person who collected sample; estimated age of rock sample; minerals analyzed; reference to most recent work published on area; short description of geologic setting plus reason for radiometric age dating; dates sample was collected and analyzed.

Reviewer P. Allen

Date 9-27-84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

~~7.7~~ Paint Samples

8. How much data were collected (number of samples/traverses, etc)?

Approx. 100 samples included in the data file.

9. What methods, procedures, or techniques were used in gathering the data?

Laboratory methods, or procedures were not evaluated by the reviewer.  
Field methods for gathering data are documented by field notes keyed to each sample.

10. Are the methods, procedures, or techniques under which the data were gathered documented?

yes

11. When are the data to be published? In what publication series? If already published when and in what document?

This data file spans period of approx. 8 years. Some of this data has been published, some to be published.

Reviewer TAMPP  
Date 28 SEPT

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?  
*U. TREND*
  
2. When were the above data collected?  
*OVER LAST FEW YEARS (WHENEVER SOMEONE COMES IN W/SAMPLE)*
  
3. Who collected the data?  
*RASBULT OR GEOLOGIST ON PROJECT*
  
4. Where is the data stored?  
*FEDERAL DATA CENTER COMPUTER CENTER*
  
5. What was the objective or purpose of the survey?  
*FIND AGE OF MATERIAL*
  
6. What parameters were determined? What features were mapped or logged?  
*ALPHA COUNT OF U-238 IS*

Reviewer TRAPP

Date 9/27/84

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

N/A

8. How much data were collected (number of samples/traverses, etc)?

VARIES

9. What methods, procedures, or techniques were used in gathering the data?

STANDARD TRENCH SAMPLE GATHERING

10. Are the methods, procedures, or techniques under which the data were gathered documented?

OPEN FILE REPORT (1980) 1089

U-SERIES DISEQUILIBRIUM (TEXTBOOK)

11. When are the data to be published? In what publication series? If already published when and in what document?

6 - 12 MONTHS OPEN FILE

Reviewer RICE

Date SEPT. 28, 1984

GEOLOGY/GEOPHYSICS DATA REVIEW CHECKLIST

1. What is the name/type of survey/test/analysis/map/core?  
3 - 8000' ft BARO. EAST-WEST AEROMAG. SURVEYS  
2 - 400' ft CONSTANT ELEVATION AEROMAG. SURVEYS  
1 - GROUND MAG. SURVEY
2. When were the above data collected?  
BAROMETRIC AEROMAG - 1963  
CONSTANT ELEVATION AEROMAG - 1978/1984  
GROUND SURVEY - 1984
3. Who collected the data?  
USGS AND SEVERAL CONTRACTORS
4. Where is the data stored?  
USGS, DENVER WEST (PAT HILL'S OFFICE)
5. What was the objective or purpose of the survey?  
EXAMINE THE REGIONAL AND LOCAL MAG. FIELD  
AROUND YUCCA MOUNTAIN
6. What parameters were determined? What features were mapped or logged?  
COMPILED DATA — PRODUCED SEVERAL MAPS —  
INFERRED DEPTHS TO MAGNETIC FORMATIONS

Reviewer RICE

Date SEPT. 28, 1984

7. What are the spatial bounds of the survey (area surveyed, to what depth)?

SEE OFR-84-120

8. How much data were collected (number of samples/traverses, etc)?

SEE OFR-84-120

9. What methods, procedures, or techniques were used in gathering the data?

STANDARD COLLECTION TECHNIQUES AND REDUCTION  
OF DATA PROCEDURES

10. Are the methods, procedures, or techniques under which the data were gathered documented?

YES, SEE OFR-84-120

11. When are the data to be published? In what publication series? If already published when and in what document?

OFR-84-120 (AND OTHERS IDENTIFIED IN THIS  
REPORT)



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

OCT 05 1984

NOTE TO: Mysore S. Nataraja, Section Leader  
Rock Mechanics Section  
Engineering Branch  
Division of Waste Management

FROM: Dinesh C. Gupta  
Rock Mechanics Section  
Engineering Branch  
Division of Waste Management

SUBJECT: TRIP REPORT ON VISIT TO NNWSI SITE, ROCK TESTING FACILITY IN  
G-TUNNEL AND ROCK CORE LIBRARY (SEPTEMBER 17, 1984)

A. BACKGROUND

The WMG staff participated in a visit to the Nevada Nuclear Waste Storage Investigations (NNWSI) site, rock testing facility in G-Tunnel and rock core library during September 17-21, 1984. David Tiktinsky and I accompanied the team for one day on September 17, 1984.

B. PURPOSE OF VISIT

The purpose of our visit to the NNWSI site was to become familiar with the site and the ground configuration in the vicinity of the proposed repository surface facilities, Yucca Mountain, and the exploratory shaft area.

The U.S. Geological Survey (USGS) core library at the Nevada Test Site (NTS) stores rock cores taken from various test boreholes drilled at the NNWSI site. The purpose of our visit to the core library was to inspect rock cores taken from the proposed repository location, and to become familiar with the physical features of the various rock formations at the proposed site.

The Sandia National Laboratory (SNL) staff is conducting field experiments on the welded and nonwelded tuff inside the G-Tunnel located at the Nevada Test Site. The purpose of our visit to the G-Tunnel was to observe the experiment location, and to become familiar with procedures, instrumentation and the G-Tunnel testing facility.

C. VISIT ACTIVITIES

The activities on September 17, 1984 at the Nevada Test Site consisted of:  
(a) observing selected rock cores and core photographs at the USGS core library; (b) attending a brief presentation of the SNL field experimentation

OCT 05 1984

- 2 -

program outside G-Tunnel; (c) visiting the facilities inside the G-Tunnel; and (d) taking a tour of the Yucca Mountain site.

### C.1 CORE LIBRARY

The USGS maintains a library of rock cores, core photographs and pertinent stratigraphic maps derived from site investigation activities at the Nevada Test Site. It was mentioned by the USGS that the library, housed in several buildings at the NTS, contains about 2 million feet of rock cores taken from various defense and non-defense related investigative boreholes at the site. The stored cores include those obtained from boreholes drilled for the evaluation of Yucca Mountain.

At the time of our visit, the core boxes for boreholes USW G-1, USW G-2 and USW G-3 were laid out on tables in one of the buildings of the library. The mentioned boreholes were drilled to partially establish the stratigraphy of Yucca Mountain, and the NRC team had requested the DOE to let the team observe the cores from these boreholes. Along with the WMGT staff, Dave and I observed all the available rock cores. We were particularly interested in taking a detailed look at the cores of the proposed target host rock i.e. the Topopah Spring member of the Paintbrush Tuff Formation. Within the repository block the Topopah Spring lies entirely above the static water level. Variable fracturing and lithophysae (air bubble effect) were observed by us in the cores.

We requested the USGS to provide us the photographs of the cores for boreholes USW G-4 and UE-25 h #1 for inspection at the library. The borehole USW G-4 is the principal borehole in the vicinity of the proposed exploratory shaft and borehole UE-25 h #1 is a horizontal hole drilled to evaluate dry coring technology. The USGS promptly provided us the requested photo albums. The Topopah Spring member in the borehole USW G-4 showed characteristics similar to those observed in other boreholes. The rock cores from the horizontal borehole UE-25 h #1 were extensively fractured, probably because of difficulty experienced during horizontal coring. An analysis of the results of this borehole would provide useful information with respect to horizontal emplacement option and the use of dry coring technique within the geologic setting.

### C.2 G-TUNNEL

The G-Tunnel is about 6,200 feet long and is located about 25 miles from the Yucca Mountain. It has been extensively used in the past for field experiments on rocks at the NTS. The SNL staff is currently performing field experiments within the G-Tunnel to evaluate thermal, mechanical and hydrologic properties

OCT 05 1984

- 3 -

of welded and non-welded tuff. The tuff strata within the G-Tunnel is considered to have similar properties to those of the tuff strata present at the Yucca Mountain in the target geologic setting. The tests and instruments being developed at the G-Tunnel may be used by the DOE on the Paintbrush Tuff at Yucca Mountain for site characterization and repository conceptual design.

Before we entered the tunnel, Roger Zimmerman of SNL made a brief presentation to us about the various field experiments inside the G-Tunnel. He described the following experiments:

- (i) Heated Block Experiment: This experiment is used to measure thermal and mechanical properties of jointed tuff. A 2m x 2m x 3m deep block of tuff is cut in the floor by making narrow vertical slots around the block. The lower end of the block is left attached to the bottom. Mechanical loads are achieved by placing pairs of 7mm thick flatjacks in the vertical slots on each of the four sides of the block. Thermal loads are achieved by placing guard heaters along two parallel lines (seven heaters on each side of the block, spaced at 0.5 m). A single heater is placed in the center of the block. The block is loaded to 7MPa while the block is at an average maximum temperature of 84°C. The data are recorded using a 155 channel sensor recorder.
- (ii) Small Diameter Heater Experiments: The purpose of these experiments is to measure the temperature distribution around the heater for model evaluations and to monitor migration of water around the heater. Two vertical tests and one horizontal test have been conducted. A 10 cm heater is placed in a 13 cm emplacement hole and is operated at a constant power level for 30 days. The entire experiment is intended to simulate and monitor thermal conditions around waste emplacement hole.
- (iii) Rocha Slot Experiment: In this experiment, a thin slot (2m x 2m x 7mm) is cut in rock with minimum disturbance to the rock. A flatjack is positioned in the slot without grout. By measuring pressure and deformation in the slot, the modulus of deformation can be determined. A second feature of the experiment is to measure in-situ surface stresses. Displacement set pins are placed around the slot before sawing of the thin slot and displacements are monitored during the slot cutting process and later during the flatjack pressurization.

OCT 05 1984

- 4 -

Inside the G-Tunnel, all the above experiments are located near the end of the tunnel. The experiment area is very well maintained and was neat and clean. On the tunnel walls, we observed the boundary of the upper stratum of welded vitrified tuff and the lower stratum of nonwelded tuff. The tunnel roof is supported by 8 feet long epoxy anchored rock bolts spaced generally at 4 feet center to center. Even though the tuff in the tunnel is saturated, the tunnel walls were generally dry, probably due to effective forced ventilation in the tunnel.

### C.3 YUCCA MOUNTAIN

On the evening of September 17, 1984, Dave Tiktinsky, Sylvie Olney and I went to observe the existing topography around the Yucca Mountain site. Paul Prestholt, the on-site NRC representative for the NNWSI project, guided us for this tour.

During our visit to the Yucca Mountain, we became familiar with the site and the ground configuration around the Yucca Mountain. Paul Prestholt showed us the general location of the area of proposed repository surface facilities. We drove to the location of drill hole USW G-4 and saw the proposed location of the exploratory shaft. While travelling to this location, we drove through the Forty-mile Canyon and noticed damage to the roads and erosion in this area due to recent rainstorms. We also visited the 'Drill Hole Wash' area to observe erosion in that area.

### D. GENERAL OBSERVATIONS

We feel that our visit to the NNWSI site, G-Tunnel and rock core library was very useful and productive. In addition to becoming familiar with the site and other DOE activities, we were able to meet Paul Prestholt and some of the principal USGS, SNL, State of Nevada and DOE personnel in-charge of various activities related to the repository licensing. All the people were extremely cooperative in providing the needed assistance to make the trip worthwhile.



Dinesh C. Gupta  
Rock Mechanics Section  
Engineering Branch  
Division of Waste Management

OCT 05 1984

- 5 -

cc: L. Barrett  
S. Coplan  
K. Stablein  
J. Greeves  
N. Tanious  
D. Tiktinsky  
D. Gupta  
B. Rice  
C. Glenn ✓  
P. Justus



## USGS QUALITY ASSURANCE DOCUMENT INDEX (CONT'D).

## Volume II

SEISMOLOGY PROCEDURES (SP)

NWM-USGS-SP-01, R2	3/1/83	Earthquake Location Procedures
NWM-USGS-SP-02, RO		Procedure for Calculating Frequency of Recurrence Curves
NWM-USGS-SP-03, RO	9/14/81	Seismic Zoning Procedure
NWM-USGS-SP-04, RO	9/14/81	Earthquake Magnitude Determination Procedure
NWM-USGS-SP-05, RO	9/14/81	Procedure For The Determination of Earthquake Source Parameters
NWM-USGS-SP-06, RO	9/14/81	Procedure For The Determination of Earthquake Focal Mechanism
NWM-USGS-SP-07, RO	1/31/83	Geophysics: Teleseismic P-residual Study of the Tectonic Environment
NWM-USGS-SP-08, RO	6/6/83	Seismic Study of the Tectonic Environment

GEOCHRONOLOGY PROCEDURES (GCP)

NWM-USGS-GCP-01, RO	6/15/81	Radiometric-Age Data Bank
NWM-USGS-GCP-02, RO	4/30/81	Labeling, Identification and Control of Geochronology Samples and Separates
NWM-USGS-GCP-03, RO	6/15/81	Uranium - Series Dating
NWM-USGS-GCP-04, RO	6/15/81	Uranium - Trend Data (Rosholt)
NWM-USGS-GCP-05, RO	6/15/81	Radium - Equivalent Uranium, Thorium, and Potassium Analysis by Gamma-Ray Spectrometry
NWM-USGS-GCP-06, RO	6/15/81	Potassium-Argon Dating
NWM-USGS-GCP-07, RO	6/15/81	Geochemical Mineral Separation
NWM-USGS-GCP-08, RO	6/15/81	Fission Track Dating
NWM-USGS-GCP-09, RO	6/15/81	Spike Calibration

GEOPHYSICS PROCEDURE (GPP)

NWM-USGS-GPP-01, RO	5/21/82	Gravity Measurement and Data Reduction
NWM-USGS-GPP-02, RO	1/11/82	Heat Flow Studies Related to Nuclear Waste Storage Investigations
NWM-USGS-GPP-04, RO		In-Situ Stress Investigations
NWM-USGS-GPP-05, RO	7/9/84	Heat Flow Studies Calibration Procedures

MULTIDISCIPLINE PROCEDURES (MDP)

NWM-USGS-MDP-01, RO	10/15/81	Identification, Handling, Storage, and Disposition of Drill-Hole Core and Samples
NWM-USGS-MDP-02, RO		Documentation of Communications, Decisions, and Independent Actions

FENIX & SCISSON PROCEDURES (FS)

NWM-USGS-FS-02, RO		Certification of Fenix & Scisson Geologists
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## - USGS QUALITY ASSURANCE DOCUMENT INDEX (CONT'D).

## Volume III

HYDROLOGY PROCEDURES (HP)

NWM-USGS-HP-01, RO	1/11/82	Methods for Determining Water Level	15 pp.
NWM-USGS-HP-02, RO	8/14/84	Acoustic Televiwer Investigations	5 pp.
NWM-USGS-HP-03, RO	1/14/82	Hydrologic Tracejector Test	7 pp.
NWM-USGS-HP-04, RO	1/11/82	Hydrologic Surging	4 pp.
NWM-USGS-HP-05, RO	1/11/82	Hydrologic Swabbing	5 pp.
NWM-USGS-HP-06, RO	1/11/82	Hydrologic Pumping Test	4 pp.
NWM-USGS-HP-08, RO	8/6/82	Methods for Determination of Inorganic Substances in Water	102 pp.
7/9/84 NWM-USGS-HP-10, R1	<del>1/11/82</del>	Packer-Injection and Shut-In Tests	5 pp. 6 pp-R
NWM-USGS-HP-11, RO	6/18/82	Methods for Determination of Radio-active Substances in Water	60 pp.
NWM-USGS-HP-12, RO	4/1/83	Procedures for Handling and Field Testing of the Core from Unsaturated Bore Holes	
NWM-USGS-HP-13, RO	8/27/83	Collection and Field Analysis of Un-saturated Zone Ground Water Samples	66 pp.
7/9/84 NWM-USGS-HP-14, R1	<del>8/24/83</del>	Method for Calibrating Peltier Type Thermocouple Psychrometers for Measuring Water Potential of Partially Saturated Media	14 pp. 14 pp.
NWM-USGS-HP-15, RO	7/9/84	Method for Calibrating Heat-Dissipation Sensors for Measuring In Situ Matric Potential Within Porous Media	8 pp.
NWM-USGS-HP-16, R1	8/14/84	Collection and Preservation of Atmospheric Precipitation Samples for Isotope Analysis	6 pp. 6 pp.
NWM-USGS-HP-17, RO	8/14/84	Method of Calibration and Testing for Operation of Pressure Transducers for Air Permeability Studies in the Unsaturated Zone	8 pp.
NWM-USGS-HP-18, RO	7/20/84	Frequency of Equipment Calibration for Un-saturated Zone Testing, Nevada Test Site	4 pp.
NWM-USGS-HP-19, RO	7/20/84	Method for Identification, Transport, and Handling of Instrumentation Packages and Equipment for Field Testing in the Un-saturated Zone at NTS	4 pp.
NWM-USGS-HP-20, RO	7/20/84	Instructions for Operation of a Standard Dead-Weight Tester	8 pp.
NWM-USGS-HP-22, RO	7/20/84	PreTiminary Probe Installation and Stemming Plan for Test Hole UZ-1, NTS	6 pp.
NWM-USGS-HP-23, RO	11/4/83	Collection and Field Analysis of Saturated Zone Ground Water Samples	(72 pp.)
NWM-USGS-HP-24, RO	7/20/84	Preliminary Plan for Final Checkout and Acceptance of Instrumentation Packages and Emplacement into Test Hole UZ-1, NTS	2 pp.
NWM-USGS-HP-25, RO	7/20/84	Methods for Measuring Water Levels Using the Dodge Logging Van (I-127410)	20 pp.

August 14, 1984

USGS QUALITY ASSURANCE DOCUMENT INDEX (CONT'D)

Volume III -- continued

HYDROLOGY PROCEDURES (HP)

- NWM-USGS-HP-26, RO 8/84 Method for Calibrating Water-Level Measurement Equipment Using the Reference Steel Tape 8 pp.
- NWM-USGS-HP-37, RO 8/14/84 Preliminary Procedure for Drilling and Coring of Wet- and Dry-Lake Sediments 4 pp.
- NWM-USGS-HP-40, RO 8/14/84 Methods for Determination of Peak Discharge by the Slope-Conveyance 9 pp.
- NWM-USGS-HP-41, RO 8/14/84 Preliminary Method of Television Recording of Surface-Water Flow 3 pp.
- NWM-USGS-HP-45, RO 8/14/84 Method of Installation, Operation, and Inspection of Recording Streamflow Gage Using the Bubble-Gage STACOM Manometer System 8 pp.
- NWM-USGS-HP-47, RO 8/14/84 Method of Operating Micrometrics Series 910 Mercury Penetration Porosimeter 13 pp.
- NWM-USGS-HP-48, RO 8/14/84 Method for Calibrating Hand-Held Glass Thermometers 4 pp.
- NWM-USGS-HP-49, RO 8/14/84 Method for Using Hand-Held Glass Thermometers 2 pp.

Enclosure 7

NRC DATA REQUEST FOR NNWSI GEOLOGY DATA REVIEW

SEPTEMBER 17-28, 1984

1. Televiewer log and stress measurement data for holes USW G-3 and UE-25 P-1, Yucca Mt. - J. Stock, et.al.
2. Seismic refraction profiles along Crater Flat and across Bare Mt., Nye County, Nevada - Hans Ackermann.
3. Copies of unpublished trench maps for: RV-1, RV-2, and trench numbers 8, 10B, 11, 13, and 14.
4. Copies of Gordon Bath's 2 and 3 dimensional aeromagnetic computer program with example models.
5. Copies of overheads compiling data collected from G-3 and G-4 cores - Len Anderson.
6. Data from crustal deformation research at the Nevada Test Site, August 1984 - William H. Prescott.
7. Data resulting from uranium dating of Quaternary deposits in the Nevada Test Site area, Nevada and California - J. N. Rosholt.
8. Data resulting from uranium trend dating of materials in the Yucca Mt. area - J. N. Rosholt.
9. Lithologic log for G-4 - R. Spengler.
10. Geologic map (1965) of the Topopah Spring SW Quadrangle, Nye County, Nevada, with new gravity data superimposed - H. Oliver.
11. Ground magnetics and micro gravity survey data across Fortymile Wash - H. Oliver.
12. Preliminary magnetic survey data of Yucca Mt. - H. Oliver/G. Bath.
13. Results of permeability studies (Part II) of the Topopah Spring Member of the Paintbrush Tuff, Nevada Test Site - D. Moore, et. al.