

YMP;197-RO  
07/24/95

**YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
REPORT OF UNEXPECTED GEOLOGIC CONDITION**

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**SECTION 1. INITIAL RESPONSE**

Initiator: W. Arch Girdley	Phone: (702) 794-1438	Date: 05/08/96	Time: 8:00 <b>AM/PM</b>
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Location:  
In Exploratory Studies Facility tunnel approximately at station 42+10 to 50+00.

Description:  
Recent geologic mapping in the ESF tunnel reveals an intense, steeply dipping fracture set trending N70W to N45W starting at about Station 42+10 meters. Intensity of fracturing wanes from about 45+06 meters to 45+80 meters, then increases to the present heading at approximately 50+00 meters. The fractures appear to be tectonic; however, cooling joints and shears cross-cut them. They are in general smooth (RS or greater), continuous (greater than 1.5 meters in length), and exhibit uniform spacing. The fractures are in the middle nonlithophysal zone of the Topopah (see attachment)

Study Plan Number: (if applicable) 8.3.1.4.2.2, Characterization of Struct. Features in Site Area	Configuration Item Number: (if applicable) N/A
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Evaluation:  
The appearance of the fracture zone having the described orientation was not anticipated, largely because no surface expression has been detected. It therefore may pre-date the Tiva Canyon, and perhaps PTn, units and potentially influence tectonic and hydrologic characterizations of the Yucca Mountain Site. For those reasons it is evaluated to be an unexpected geologic condition.

Recommendation of technical significance, non-technical significance, or non-significance:  
Technically significant

Justification:  
The unexpected geologic condition has potential impact on site models for tectonism and hydrology and requires specific investigation to determine what influence the fracture zone may impose.

Recommendation of additional data needs and/or delay or work:  
Additional data needs are indicated, but no delay of work is warranted.

Justification:  
The Principal Investigator is already working under the appropriate study plan to address the unexpected condition and is formulating hypotheses that may explain the condition. Additional work will be needed to address questions about whether the fractures are indeed tectonic in origin, extent of the zone, any changes in fracture orientation, age of formation (pre-Tiva Canyon? Pre-PTn, syn-PTN?), relationship to the Ghost Dance Fault, amount of broken ground at potential repository level, and other questions that may arise as tunneling and mapping progress. Work needs to continue (see

Actions taken:  
None required.

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FTC or Designee Signature:

*W. A. Girdley*

Date:

5/8/96

Exhibit YAP-30.27.1

Enclosure

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SECTION 2. REVIEW OF ACTIVITIES AND RESPONSE CLOSEOUT (to be completed by the AMSP or designee with concurrence from the AMEFO, AMSL, and FTC or their designees)

Review of FTC evaluation:

*I have reviewed the evaluation of the FTC and concur with the evaluation and recommendations.*

This geologic condition has been evaluated and determined:

- Technically Significant and Reportable per YAP-30.27
- Non-technically Significant or Non-significant

If technically significant and reportable:

- 1. Additional data needs are indicated  Yes  No

Description: (data needs, responsible persons, study plans, etc.)

*As noted by the FTC*

- 2. Delay of work is indicated:  Yes  No

Description: (extent of delay, hold points, affected organizations, affected activities, etc.)

Persons notified of decisions and course of action:

*Dennis Williams of AMSP notified T. Bjerstedt of AMSL Licensing Team on 5/13/96 @ 9:00 am.*

AMSP or Designee Signature:

*Dennis Williams Deputy AMSP*

Date:

*5/13/1996*

AMEFO or Designee Signature:

Date:

AMSL or Designee Signature:

Date:

FTC or Designee Signature:

Date:

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**ATTACHMENT 1**

**DESCRIPTION:** Spring unit, and there is no indication of such an intense fracture set with this orientation at the surface in the overlying Tiva Canyon unit or in exposures of Tiva Canyon, the PTn interval, and Topopah Spring in Solitario Canyon. First appearance of the fracture zone in the tunnel is approximately below Split Wash, which the zone parallels and which is where the Ghost Dance fault zone exhibits a change in character where it cuts the Tiva Canyon Unit.

**ATTACHMENT 2**

**JUSTIFICATION:** in order to further expose the extent and nature of the fracture zone, which is in turn necessary to provide answers to questions above as well as to possible influence on the site hydrology.