

SUMMARY OF THE NRC-DOE
HYDROGEOLOGY WORKSHOP
SEPTEMBER 20-21, 1983

The following points were made by NRC:

Observation

1. Significant progress has been made toward defining the potentiometric surface especially to the east of the Solitario fault; however, more work needs to be done to define the characteristics of the anomalies in the hydraulic gradient to the north and west, and to understand the hydrologic significance of the anomalies. (The lack of a physical understanding of the anomalies seems to result in an inconsistency in the way the faults are treated in the modeling done at different scales, e.g. regional, sub-regional, etc.).
2. A great deal of data has been acquired since the January, 1983 meeting; however, publication of analyses and interpretations has been relatively slow. There is a need to make interpretations of the data available in a more timely manner.
3. Several alternative conceptual models have been developed for the unsaturated zone, all of which are consistent with the available data. A similar approach, i.e. considering reasonable alternative interpretations of the available data should be carried into other areas of the program.
4. There is a concern that measurement techniques proposed for the determination of unsaturated zone hydraulic properties may not differentiate between porous and fracture flow. This is an important concern because in the presentation on characterization of the unsaturated zone it was stated that, at least in some units, fracture flow is relatively insignificant. NRC considers the question of relative significance of fracture versus matrix flow to be open.
5. There is a need to examine the time variation of water quality data with respect to time.

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6. The meeting provided a valuable opportunity for pre-licensing consultation.

Topics for Further Discussion

1. Characterization of the unsaturated zone.
2. Whether there should be a break-out from the exploratory shaft into the upper clastic unit.

Information Requested

1. A map of the piezometric surface.
2. A description of the strategy, rationale, and objectives of the test series planned for the C-well cluster.
3. A description of the strategy, rationale, and objectives of the unsaturated zone test plan.
4. Copies of the viewgraphs used by Parviz Montazer.

The following points were made by DOE:

Observations

1. The meeting provided good insight into the logic of NRC's technical staff to aid NNWSI in identifying technical issues that will have to be resolved later when we submit the SCP to NRC.
2. These meetings continue to provide the NNWSI technical staff with a good understanding of the potential regulatory needs.

Topics for Further Discussion

1. Disturbed zone - There still seems to be a difference in perceptions between NRC and NNWSI technical staff about the size of the disturbed zone and what constitutes a "significant" change. NNWSI desires additional discussions on this topic at a future meeting.

2. **Paleohydrology - NNWSI recognizes that the link between future ground water recharge and the ongoing paleohydrology investigations is difficult and asks that NRC provide alternative approaches and investigative methods that would be acceptable for licensing. In the absence of direct evidence the approach adopted by NNWSI utilizes indirect evidence based upon several different methods and NNWSI wants to insure all viable alternatives are considered.**
3. **Modifications to 10CFR60 for the unsaturated zone - NNWSI requests a meeting with NRC to have NRC's technical staff explain the rationale behind the changes proposed to 10CFR60 for the unsaturated zone. NNWSI is preparing, a technical position paper about this subject and needs the benefit of additional technical discussions to sharpen our position.**
4. **The NNWSI program to characterize the unsaturated zone is pushing the state-of-the-art in hydrology and we ask for a meeting that presents NRC sponsored research and applied investigations aimed at characterizing this zone.**

Information Requested

1. **The NNWSI program would benefit by the receipt of monthly and quarterly progress reports from NRC contractors working on projects having significance to the NNWSI Program.**

The following statement was made for the State of Nevada:

1. **The State of Nevada appreciates the opportunity to participate in the NRC/DOE hydrogeology workshop. The technical dialogue was most informative to the state and its review of the NNSWI program. We would encourage future technical workshops of this kind. (Statement provided by Carl Johnson)**

Agreements Reached

1. **NRC and DOE agreed to hold a meeting regarding characterization of the unsaturated zone at an early time. Within two weeks, DOE will propose a date for the meeting and by October 31, NRC will propose a list of discussion topics.**

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This Summary was prepared by Seth M. Coplan (NRC) and Maxwell Blanchard (DOE).

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REGISTRATION

NAME	COMPANY	TELEPHONE	NAME	COMPANY	TELEPHONE
Bill Wilson	USGS	FIS 234-2115	Gene Rush	USGS	234-2115
Jim Robison	USGS	" "	James R. Erickson	USGS	" "
JOE WILLMON	USGS	FIS 234-7277	Tom HENDERSON	USGS	234-2115
Bill Dudley	USGS	" " "	Sean L. Younger	LLNL	543-1110
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Robert W. Craig	USGS	234-2115	Martin M. Sliwa	William & Assoc	(702) 798-888
Jack Hess	William & Assoc	702-645-4503	Michael J Carr	USGS	234-2266
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Allen Ogaard	LANL	FIS 843-6344	Dave Nichols	USGS	702 882-138
Peter Ornstein	NRC	FIS 427-4661	Pat Blum	USGS	702 882-138
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Seth M Coplan	NRC	3014274275	George B. Loomsburg	Williams Assoc	

AGENDA
• NNWSI HYDROLOGY BRIEFING FOR NRC
September 20-21, 1983

Holiday Inn West
14707 West Highway 40 (Colfax)
Golden, CO
Phone: (303) 279-7611

Tuesday, September 20

0830-0900 Introductory comments -- DOE/NRC/USGS

0900-1130 Yucca Mountain hydrology (saturated zone)
 (includes
 15-minute
 break) Test-drilling program (Robison)-60
 Head distribution (Robison)-45
 Tracer Tests (Waddell)-30

1130-1300 Lunch

1300-1345 Subregional flow and transport model
 (Waddell, Czarnecki)-45

1345-1630 Paleohydrology
 (includes
 15-minute
 break) Relation to Information Needs (Wilson)-20
 Ongoing program
 Packrat midden studies (Spaulding)-40
 Flood-hazard studies (Glancy, Costa)-30
 Amargosa mapping (Wilson)-10

 Proposed investigations
 Lacustrine studies (Benson)-15
 Water-balance model (Nichols)-20
 Ground-water flow model (Waddell)-15

Wednesday, September 21

0800-1130 Yucca Mountain hydrology (unsaturated zone)
 (Montazer)
 (includes
 15-minute
 break) Conceptual model
 Surface-based test drilling
 Exploratory Shaft test plan

1130-1300 Lunch

1300-1400 Yucca Mountain and regional hydro-chemistry
 (Henderson)

1400-1415 Break

1415-1500 NRC caucus

1500-1630 Feedback (NRC) and wrap-up discussion (All)