



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

DATE: February 8, 1996

TO: John H. Austin, Chief
Performance Assessment and High-Level Waste Integration
Branch, Division of Waste Management
Office of Nuclear Materials Safety and Safeguards

FROM: William Belke, Sr. On-Site Licensing Representative for
Quality Assurance and Engineered Systems *Belke*
Chad Glenn, Sr. On-Site Licensing Representative for
Natural Systems and Total Systems *Chad Glenn*

SUBJECT: U. S. NUCLEAR REGULATORY COMMISSION ON-SITE LICENSING
REPRESENTATIVES' REPORT ON YUCCA MOUNTAIN PROJECT FOR
JANUARY, 1996

INTRODUCTION

The principal purpose of the On-Site Representatives' (OR) reports is to alert NRC staff, managers and contractors to information of U. S. Department of Energy (DOE) programs for site characterization, repository design, performance assessment, and environmental studies that may be of use in fulfilling NRC's role during pre-licensing consultation. The principal focus of this and future OR reports will be on DOE's programs for the Exploratory Studies Facility (ESF), surface-based testing, performance assessment, data management systems and environmental studies. Relevant information includes new technical data, DOE's plans and schedules, and the status of activities to pursue site suitability and ESF development. In addition to communication of this information, any potential licensing concerns, or opinions raised in this report represent the views of the ORs and not that of NRC headquarters' staff.

QUALITY ASSURANCE (QA)

1. Attended the January 10-11, 1996, full Nuclear Waste Technical Review Board (NWTRB) meeting held in Las Vegas, Nevada. Topics discussed included: 1) a DOE update of the ESF program and surface testing status and current priorities; 2) an update from representatives of the United Kingdom (UK) and China on their respective programs associated with nuclear waste disposal; 3) the development and application of expert judgement; 4) a discussion of the National Academy of Sciences (NAS) review and comments on the DOE first Technical Basis Report (TBR); and, 5) the management of defense waste and surplus materials.

JHC-3-11
10-7
2-11

Representatives from DOE, NRC, Civilian Radioactive Waste Management and Operating Contractor (M&O), NAS, and State of Nevada also gave presentations.

The key DOE speaker, Dr. D. Dreyfus, the DOE Director, Office of Civilian Radioactive Waste Management, was unable to attend due to blizzard conditions in Washington, D.C. W. Barnes, the Yucca Mountain Site Characterization Office Project Manager, presented the summary of the report that was prepared by Dr. Dreyfus. Mr. Barnes stated that due to funding cuts, the work force has been significantly reduced to about 1200 personnel. Consequently, DOE's goals for the Yucca Mountain Project have been modified. The Environmental Impact Statement and licensing activities have been deferred and replaced with a "viability assessment." A viability assessment, as defined by Dr. Dreyfus in his presentation, essentially is a DOE management evaluation that will describe the aspects of the repository and waste package design that are critical to performance, technical feasibility, behavior, and an estimate of costs for licensing, construction, and operations of the facility. The NWTRB asked several questions regarding the definition of viability assessment and at what point in the tunnel operations can a decision be made to present the result of this assessment to Congress. Mr. Barnes indicated that this determination is all part of the viability assessment study.

Following Mr. Barnes, the DOE Assistant Managers and Geoengineering Team Leader provided comprehensive updates on E/SF construction, waste containment and isolation strategy, site investigations, and in-situ thermal tests.

The last presenters for this session were the representatives from the UK and China. The UK representative indicated that based on preliminary data from observations and tests, if successful, could lead to optimistically having their repository in Sellafield, England, in operation as early as 2012. The Chinese representative however, indicated that geological work for site selection is still in the early stages and repository operation is planned for 2051.

The second day of the NWTRB meeting was devoted to the areas of expert judgement, review and comments on the DOE Technical Report on Surface Processes, and the Management of Defense and Surplus Fissile Materials.

Representatives from DOE, NRC, and the State of Nevada gave presentations. The DOE representative presented the status and scope of the DOE's position on expert judgement followed by the NRC representative's presentation on its position on the use of expert judgement in licensing. The last presenter for this part of the meeting was the representative from the

State of Nevada. The NWTRB commented that the expert judgement process might be enhanced if the membership were increased from five to ten in certain instances. The NWTRB also commented that consideration be given to including an individual from a foreign country for elicitation in expert judgement, because this individual could potentially contribute information from a different perspective.

The Chairman from the NAS committee that performed the review of the DOE TBR discussed the methodology and conclusions resulting from this review followed by the State of Nevada's approach and review of the TBR. Next, DOE summarized their understanding of this review process and grouped the review into three categories of comments. In general, DOE agreed with the NAS review and offered clarification on the NAS review comments. DOE concluded that the report conclusions were sound but agreed that documentation was deficient in the TBR. The NWTRB inquired as to whether the NAS review of the TBR was a mismatch to which DOE replied they thought it was. The NWTRB indicated that the TBR was applied science and perhaps this type of report material should not have been reviewed by NAS.

The following day, 23 individuals from the NWTRB meeting were provided with an extensive tour and update of the ESF and tunnel boring machine (TBM) operations. This was a first time tour for many of these individuals. Feedback from this tour indicated that numerous questions were asked and the individuals were favorably impressed with the overall ESF progress and TBM operations.

2. The ORs received a copy of the Total System Performance Assessment (TSPA) dated November 1995 (Document B00000000-01717-2200-00136, Rev. 01). This report basically documents the quantitative predictions for the processes and parameters potentially affecting the long term behavior of the disposal system used to assess the Yucca Mountain Site and its associated engineered designs to meet NRC and U. S. Environmental Protection Agency regulatory objectives. On the TSPA sign-off sheet, it is noticed that the QA organization did not appear to have been involved in the preparation, review, or approval of this document. Since this document contains significant information to potentially meet regulatory requirements, it would appear from a quality perspective, that the QA organization should have been involved in the review, comment, and approval process. It is therefore recommended that for future TSPA document development, that the QA organization be involved.

EXPLORATORY STUDIES FACILITY (ESF)

1. Tunnel Mapping

As of 8 a.m., Friday, January 26, 1996, the Tunnel Boring Machine (TBM) advanced to station 39+34 meters. Geologic mapping and sampling were completed to station 38+50 meters. Preliminary tunnel stratigraphy is summarized in Enclosure 1.

Sundance Fault:

A series of northwest trending steeply-dipping shears and small fault planes intersect the ESF tunnel between stations 35+85 and 36+40. This structure is believed to be the southeast projection of the Sundance Fault. The main trace of this fault is northwest of this location. A distinct plane, showing evidence of horizontal slickensides, intersects the right wall and left wall of the tunnel at stations 35+93 and 36+27 respectively. At this location there is no evidence of vertical offset on this fault and horizontal offset is projected to be limited to several meters.

2. Alcove Testing

Alcove 1:
No Activity

Alcove 2:
The main purpose of testing in this alcove is to determine the hydrologic properties of the Bow Ridge Fault. In radial borehole 1 investigators completed air permeability testing and conducted gas sampling for C^{14} and $C^{12/13}$ in the Tiva Canyon Formation, Bow Ridge Fault breccia and Pre-Rainier tuff. Preliminary air-permeability values obtained in this borehole range from 0.5 to 13.0 darcies in the Tiva Canyon Formation, 7.6 to 8.0 darcies in the Bow Ridge Fault breccia, and 14.0 to 27.0 darcies in the Pre-Rainier tuff.

Alcove 3:
The main purpose of testing in this alcove is to test the hydrologic properties of the stratigraphic contact between the Tiva Canyon welded and Paintbrush nonwelded units. The two radial boreholes previously drilled and logged (video, temperature and caliper) remain closed-off with packers. These packers prevent gas circulation until gas sampling can be conducted.

Alcove 4:
The main purpose of this borehole is to test the hydrologic properties of Paintbrush nonwelded/Topopah Spring tuff contact. Investigators cored the first borehole in this alcove to a depth of 120 feet and ran video, temperature and caliper logs in the borehole. This borehole was then closed-off until the start of further testing.

Thermal Test Alcove:

The Alpine Miner was moved to station 28+27 to begin excavating the Thermal Test Facility. The excavation of this alcove advanced approximately 15 meters from the centerline of the ESF main drift.

SURFACE-BASED TESTING

1. Borehole Drilling and Testing

The locations of boreholes referenced in this section is provided in Enclosure 2.

Pneumatic Testing

DOE investigators continue to collect pneumatic data in boreholes NRG-6, NRG-7a, UZ-4, UZ-5, UZ-7a, and SD-12. Nye County is also recording pneumatic data from instrumentation installed on the TBM and in boreholes NRG-4 and ONC-1.

SD-7

Access tubes were installed in this borehole to monitor downhole barometric pressure changes before the TBM passes this area. Temporary instrumentation installed in this borehole is monitoring zones above and below the perched water previously encountered in this borehole. Preliminary results from the first two week of data collection indicate that there is little or no response to changes in barometric pressure in the lower zone (between water table and perched water), and only slight attenuation of barometric pressure in the upper zone (above the perched water). These results indicate that the lower zone is pneumatically isolated from the zone above the perched water.

USW WT-10 and USW G-2

Investigators initiated pump tests at USW WT-10 and USW G-2 for the purpose of obtaining hydrochemistry samples and hydrologic data for the development and validation of saturated flow and transport models. A brief summary of recent activities conducted with respect to these tests is provided in Enclosure 3.

C-Well Complex

All equipment is installed and ready for the start of the tracer test. DOE is awaiting final approval from the State of Nevada to begin injecting a sodium iodide tracer. This tracer test is expected to begin in early February 1996.

GENERAL

1. Meetings/Interactions

- Attended the regularly scheduled bi-weekly meeting with W. Barnes (Yucca Mountain Site Characterization Office (YMSCO) Project Manager), YMSCO Assistant Managers, and the YMSCO QA Manager. Topics discussed at this meeting included: 1) NRC/DOE feedback from the January 10-11, 1996, Nuclear Waste Technical Review Board Meeting in Las Vegas, Nevada; 2) status of reclassifying ESF ground support; 3) schedule for publishing Strategy For Waste Isolation For Yucca Mountain Site; 4) status of funding to State and Local Governments and T. Bevill January 11, 1996, letter; 5) status of design for backfill of ESF Main and Emplacement Drifts; 6) status of design document consolidation; 7) NRC Headquarters Division of Waste Management pending reorganization; 8) update on the potential move of the NRC OR office to the Summerlin facility; 9) January 31, 1996, OR presentation to the Nevada Legislature's Committee on High-Level Radioactive Waste and 9) tunnel boring machine status/plans.
- The ORs gave a presentation to the State of Nevada Legislature's Committee (NLC) on High-Level Radioactive Waste in Las Vegas, Nevada, on January 31, 1996. The meeting was attended by various interested members of the public and members of the press.

The NLC, consists of eight individuals, namely, four State Senators, and four State Assemblymen appointed by the Nevada State Legislature. Of this body, there is a Chairman and a Vice Chairman selected. The purpose of the NLC is to study and evaluate: 1) information and policies regarding the location of a facility in Nevada for the disposal of high-level radioactive waste, and 2) any potential adverse effects from the construction and operation of such a facility and ways of mitigating any of those adverse effects. Results of the NLC's studies are reported to the Nevada Legislature for any future legislative action that may be required.

The opening presentation was given by W. Barnes and R. Dyer from the Yucca Mountain Project Office. They provided an update on the scientific work and progress at Yucca Mountain and the effects of the recent Congressional budgetary constraints. Mr. Barnes also presented the status of the legislation and authorization bills currently being considered by Congress for nuclear waste disposal. One of the NLC members inquired whether the DOE Secretary of Energy, Hazel O'Leary, had ever visited the Yucca Mountain project and toured the ESF. The DOE response was

that the Secretary had never toured the ESF. The NLC indicated that the Secretary should be encouraged and take the opportunity and tour the site. The Committee also expressed concern that the six billion dollars deposited in the Nuclear Waste Fund is not being released to provide the necessary funding for the project and oversight activities to the State and affected local units of government. Mr. Barnes explained that this is a decision controlled by the Congress of the United States.

The second presentation was from Mr. Robert Loux, the Executive Director of the Nevada Agency for Nuclear Projects, Nuclear Waste Project Office. Mr. Loux presented an update on the Project Office's activities and monitoring efforts for DOE site characterization activities. It was indicated that due to lack of funding, certain of the Project Office's activities have either been curtailed or cancelled. A significant number of questions were directed to Mr. Loux regarding the Project Office's use of 38 contractors and whether the funding was being appropriately spent. One of the Senators commented that this Project Office appears to be a "contract factory."

The last presentation to the NLC was from the OR's who provided: 1) an overview of the OR responsibilities for the Yucca Mountain Project; 2) an update of the NRC activities and the NRC 10 Key Technical Issues (KTIs); and 3) a description of the regulatory requirements in effect for establishing an interim storage facility. After the question and answer session, members of the NLC indicated they were pleased with the informative NRC OR presentation. The NLC also expressed satisfaction that the NRC is focusing their efforts towards scientific and technical issues.

The following day, February 1, 1996, an article covering this meeting appeared in the Las Vegas Sun newspaper. In this article, the ORs were quoted as stating the two top worries for the NRC are volcanic action and earthquakes. The ORs contacted the author of this article and explained that these issues are not NRC's top two worries, rather they are simply two of the KTIs. We explained that these two issues are the issues NRC and DOE do not totally agree on at this time relative to their importance in conjunction with the list of KTIs. The author explained that this error was due to an editing problem and expressed her apology.

The OR's perception of the NLC from this meeting is that questions are directed in a professional and frank manner in order to obtain all the necessary information directed towards reaching an educated and rationale conclusion on

matters relating to the potential construction and operation of a repository facility.

- Attended the January 19, 1996 NRC/DOE Management Videoconference meeting conducted in Washington, D.C., and Las Vegas, Nevada. The purpose of this meeting was to discuss the current DOE viability assessment approach and how much can be accomplished under budget constraints imposed on DOE and NRC. NRC presented a proposed approach whereby preclicensing issues that can be resolved, be resolved in a more timely manner. NRC and DOE agreed that meetings between the two, be arranged to accomplish more productive objectives.

2. Appendix 7 Site Interactions

The ORs are making preparations for an Appendix 7 type meeting to be held in Las Vegas, Nevada, planned for March 13 and 14, 1996. The purpose of this meeting will be for NRC to obtain clarification on the performance goal based seismic design methodology proposed in DOE's Topical Report 2. Three members of the NRC Headquarters Engineering and Geoscience Branch and three members from the Center for Nuclear Waste Regulatory Analyses staff are planning to attend.

3. Reports

Over this reporting period, the following reports were received in the Las Vegas Office:

DOE, NEVADA OPERATIONS OFFICE

THE ENVIRONMENTAL IMPACT STATEMENT FOR THE NEVADA TEST SITE AND OFF-SITE LOCATIONS IN THE STATE OF NEVADA, 1/96 (DRAFT)

LAWRENCE LIVERMORE

UCRL-ID-113140 - EQ3/6 SOFTWARE TEST AND VERIFICATION REPORT, 9/94; TAD KISHI, 2/96

UCRL-ID-119723 - AN OVERVIEW OF EXTOOL: AN ANALYSIS TOOL FOR V-TOUGH AND NUPT; S. DAVELER, 8/95

UCRL-ID-119842 - GEOTHERMAL AREAS AS ANALOGUES TO CHEMICAL PROCESSES IN THE NEAR-FIELD AND ALTERED ZONE OF THE POTENTIAL YUCCA MOUNTAIN, NEVADA REPOSITORY; C. BRUTON, W. GLASSLEY, A. MEIKE, 10/95

UCRL-ID-122055 - SUMMARY OF PRE AND POST-PROCESSORS FOR V-TOUGH; S. DAVELER, 8/95

UCRL-ID-122256 - MICROBIAL ACTIVITY AT YUCCA MOUNTAIN; J. HORN AND A. MEIKE, 9/95

LOS ALAMOS

LA-12977-MS - DISTRIBUTION AND CHEMISTRY OF FRACTURE-LINING MINERALS AT YUCCA MOUNTAIN, NV; B. CARLOS, S. CHIPERA, D. BISH, 12/95

LA-13017-MS - SOLUBILITY AND SPECIATION RESULTS FROM OVER- AND UNDERSATURATION EXPERIMENTS ON NEPTUNIUM, PLUTONIUM, AND AMERICIUM IN WATER FROM YUCCA MOUNTAIN REGION WELL UE-25p #1; (LAWRENCE BERKELEY LAB), H. NITSCHKE, K. ROBERTS, K. BECRAFT, T. PRUSSIN, D. KEENEY, S. CARPENTER, D. HOBART, 11/95

LA-13018-MS - SOLUBILITY AND SPECIATION RESULTS FROM OVERSATURATION EXPERIMENTS ON NEPTUNIUM, PLUTONIUM, AND AMERICIUM IN A NEUTRAL ELECTROLYTE WITH A TOTAL CARBONATE SIMILAR TO WATER FROM YUCCA MOUNTAIN REGION WELL UE-25p #1; (LAWRENCE BERKELEY LAB), P. TORRETTO, K. BECRAFT, T. PRUSSIN, K. ROBERTS, S. CARPENTER, D. HOBART, H. NITSCHKE, 12/95

LA-13066-MS - PRELIMINARY LIBS ANALYSIS OF YUCCA MOUNTAIN MANGANESE OXIDE MINERALS; J. BLACIC, D. PETTIT, D. CREMERS, 1/96

SANDIA

SAND95-2081 - SOLUTION OF PROBLEMS WITH MATERIAL NONLINEARITIES WITH A COUPLED FINITE ELEMENT/BOUNDARY ELEMENT SCHEME USING AN ITERATIVE SOLVER; J. KOTERAS, 1/96

U.S. GEOLOGICAL SURVEY

WATER-RESOURCES INVESTIGATIONS REPORT 95-4057 - ADSORPTION OF SULFUR HEXAFLUORIDE ONTO CRUSHED TUFFS FROM THE YUCCA MOUNTAIN AREA, NYE COUNTY, NEVADA; G. RATTRAY, R. STRIEGL, I. YANG, 1995

LAWRENCE BERKELEY LABORATORY

LBL-37729 - PRELIMINARY ANALYSIS OF EFFECTS OF THERMAL LOADING ON GAS AND HEAT FLOW WITHIN FRAMEWORK OF LBNL/USGS SITE SCALE MODEL; Y. WU, G. CHEN, G. BODVARSSON, 12/95

NUREG

NUREG/CR-6382 - COMPARISONS OF ASTM STANDARDS CITED IN THE NRC STANDARD REVIEW PLAN, NUREG-0800, AND RELATED DOCUMENTS; (PACIFIC NW LAB), A. ANKRUM, K. BOHLANDER, E. GILBERT, R. PAWLOWSKI, J. SPIESMAN, 10/95

MISCELLANEOUS PAMPHLETS

(1995 MATERIAL RESEARCH SOCIETY) - SIMULTANEOUS TRANSPORT OF SYNTHETIC COLLOIDS AND A NONSORBING SOLUTE THROUGH SINGLE SATURATED NATURAL FRACTURES; P. REIMUS, B. ROBINSON, H. NUTTAL, R. KALE

(8TH INTERNATIONAL SYMPOSIUM ON WATER-ROCK INTERACTION, [RUSSIA, 8/95]) - WATER-ROCK INTERACTION; B. CARLOS, S. CHIPERA, M. SNOW, (LANL)

cc w/encs.:

R. Milner, DOE-OCRWM
R. Loux, State of Nevada
J. Meder, Nevada Legislative Counsel Bureau
W. Barnes, YMSCO
D. Horton, YMSCO
N. Chappell, M&O
H. Haghi, M&O
M. Murphy, Nye County, NV
M. Baughman, Lincoln County, NV
D. Bechtel, Clark County, NV
D. Weigel, GAO
P. Niedzielski-Eichner, Nye County, NV
B. Mettam, Inyo County, CA
V. Poe, Inyo County, CA
W. Cameron, White Pine County, NV
R. Williams, Lander County, NV
L. Fiorenzi, Eureka County, NV
J. Hoffman, Esmeralda County, NV
C. Schank, Churchill County, NV
L. Bradshaw, Nye County, NV
W. Barnard, NMTTB
R. Holden, NCAI
A. Melendez, NIEC
R. Arnold, Pahrump, NV
N. Stellavato, Nye County, NV
J. Greeves, NRC WA (T7J-9)
J. Thoma, NRC WA (T7F-1)
M. Bell, NRC WA (T7C-6)
M. Federline, NRC WA (T7J-9)
J. Spraul, NRC WA (T7F-1)
A. Garcia, NRC WA (T7J-9)
J. Austin, NRC WA (T7F-1)
C. Paperiello, NRC WA (T8A-23)
M. Knapp, NRC WA (T8A-23)
R. Irish, NRC WA (T-5D28)
W. Reamer, NRC WA (O15B-18)
H. Patrick, CNWRA (Center

PRELIMINARY ESF NORTH RAMP STRATIGRAPHY

<u>STRATIGRAPHY</u>	<u>STATION</u>
Tiva Canyon crystal poor upper lithophysal zone	0+00 to 0+99.5m
Tiva Canyon crystal poor middle nonlithophysal zone	0+99.5 to 1+90m
Tiva Canyon crystal poor lower lithophysal zone	1+90 to 1+99.5m
Bow Ridge fault zone	1+99.5 to 2+02m
Ranier Mesa	None
Pre-Ranier Mesa tuff	2+02 to 2+63.5m
Tuff "X"	2+63.5 to 3+37m
Pre-Tuff "X"	3+37 to 3+49.5m
Tiva Canyon vitric zone	3+49.5 to 3+59.5m
Tiva Canyon crystal rich nonlithophysal zone	3+59.5 to 4+34m
Tiva Canyon crystal rich lithophysal zone	4+34 to 4+39m
Tiva Canyon crystal poor upper lithophysal zone	4+39 to 5+53m
Tiva Canyon crystal poor middle nonlithophysal zone	5+53 to 5+87m
Tiva Canyon crystal poor lower lithophysal zone	5+87 to 6+19m
Tiva Canyon crystal poor lower nonlithophysal zone	6+19 to 7+77m
Tiva Canyon crystal poor vitric zone	7+77 to 8+69m
Pre-Tiva Canyon bedded tuffs	8+69 to 8+72.5m
Yucca Mountain Tuff	8+72.5 to 8+73.5m
Pre-Yucca Mountain bedded tuffs	8+73.5 to 9+10m
Pah Canyon Tuff	9+10 to 10+20m
Pre-Pah Canyon bedded tuffs	10+20 to 10+51.5m
Topopah Spring Tuff crystal rich vitric zone	10+51.5 to 11+93m
Topopah Spring crystal rich nonlithophysal zone	11+93 to 17+17m
Topopah Spring crystal rich lithophysal zone	17+17 to 17+97m

Topopah Spring crystal poor upper lithophysal zone

17+97m to 27+20m

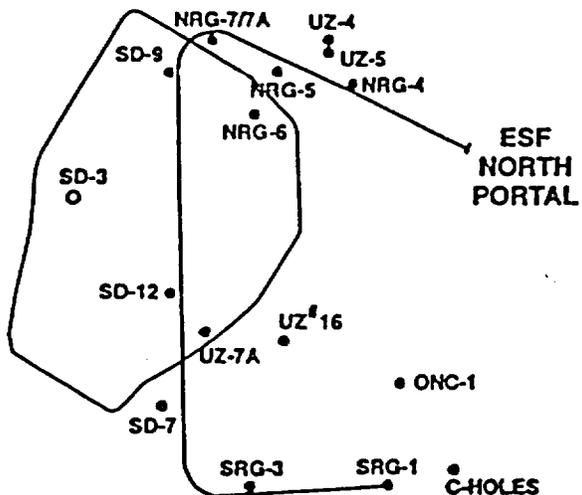
Topopah Spring crystal poor middle nonlithophysal zone (Tsw2)

27+20m to face

Notes: All stations given are referenced to the right springline unless otherwise noted. Stratigraphy is based on preliminary reports by United States Bureau of Reclamation mappers and is subject to revision.

Selected Borehole Locations

• G-2



• WT-10

0 1 MILE

USGS MONTHLY STATUS REPORT
Pumping and Testing Existing Monitoring Wells

January, 1996

SA # 0G33131G96

SA Manager: Robert Graves

P&S #:0G33131

Type of Account: Discrete

I. Latest revised estimate: (\$000.00) _____ hours _____

II. Progress Against Plans/Schedule:

A. Schedule Status:

See Attached Sheet

B. Narrative of Work Performed:

3GWF621 -- CONDUCT PUMPING AND TESTING OF WELLS - PART II :

• On 01/08/96, R. Goemaat and R. Graves moved the USGS trailer from well USW G-2 to the HRF to prepare the trailer for transport to well USW WT-10. (T)

• On 01/09/96, G.M. O'Brien, R. Goemaat, and R. Graves transferred the USGS trailer from the HRF to well USW WT-10. Data collection equipment (Campbell scientific CR10 data logger serial number 6242, storage module SM718 serial number 4500, and Setra 270 barometer serial number 385846) were set up in the trailer. A water-level measurement was made at USW WT-10 and Paroscientific transducer serial number 62269 was calibrated and installed in the well. Equipment installed to measure discharge measurements included 50-gallon bucket #5 and McCrometer MW503 flowmeter serial number 595. The pump at well WT-10 was turned on at approximately 1430 and pumped until 1517. Discharge from the well ranged from 53 to 72 gallons per minute. At 72 gallons per minute drawdown in the well was approximately 1 foot. Approximate total volume of water discharged for 01/09/96 was 2,700 gallons. (T)

1
ENCLOSURE 3

- On 01/10/96, G.M. O'Brien and R. Graves pumped well USW WT-10. The well was pumped from approximately 1115 to 1120 at 28 gallons per minute and from 1425 to 1540 at about 73 gallons per minute. At 73 gallons per minute, drawdown in the well was approximately 1.09 feet. Approximate total volume of water discharged for 1/10/96 was 5,200 gallons. (T)
- On 01/10/96, G.M. O'Brien began preparing a new set of equipment to be installed at well USW G-2 for a scheduled hydraulic test to be conducted. Preparation of the equipment also included a calibration check of the barometer to be used at G-2 during the test. (T)
- On 01/11/96, R. Graves pumped well USW WT-10. The well was pumped from 1000 to 1445 at 73 gallons per minute. Approximate drawdown in the well was 1.04 feet. Approximate total volume of water discharged for 01/11/96 was 21,200 gallons. Scheduled collection of water-quality samples at WT-10 was not completed because water was too turbid to complete the sampling. (T)
- On 01/11/96, G.M. O'Brien with R. Goemaat, completed preparation of the equipment needed to be installed at well USW G-2. Grady prepared a detailed outline of the procedures to be followed in installing the Paroscientific transducer. Grady also updated the procedures for data collection while conducting the hydraulic tests at WT-10 and G-2. (T)
- On 01/16/96, R. Goemaat pumped well USW WT-10. The well was pumped from 0948 until 1450 at approximately 73 gallons per minute. Approximate drawdown in the well was 0.98 feet. Approximate total volume of water discharged for 01/16/96 was 21,900 gallons. (T)
- On 01/17/96, at well USW G-2, R. Goemaat and C. Savard, made a water-level measurement and calibrated and installed Paroscientific transducer serial number 62271. This was done to continue with the attempts to complete a hydraulic test at G-2. Other equipment installed at G-2 included Campbell scientific CR10 data logger serial number 6241, storage module SM192 serial number 2746, and Selra 270 barometer serial number 588128. Fifty gallon bucket #3 was installed so discharge measurements could be made. The pump at G-2 was turned on between approximately 1300 and 1530. Flow rates varied from about 10 to 60 gallons per minute. Drawdown in the well was about 40 feet. The well was pumped to begin the environmental sampling prior to conducting the hydraulic test. (T)

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- On 01/17/96, H. Graves conducted a step/drawdown test at well USW WT-10. The well was pumped from 1001 until 1442. During the first 4 hours of pumping the discharge was changed every hour. Beginning with the initial flow rate of approximately 18 gallons per minute, flow rates were varied to approximately 38, 58, and 73 gallons per minute. Approximate drawdown for each discharge rate was 0.26 feet (18 gpm), 0.57 feet (38 gpm), 0.89 feet (58 gpm), and 1.22 feet (73 gpm). This data has not been corrected for barometric changes which may have occurred during the test. Approximate total volume of water discharged for 01/17/96 was 14,300 gallons. (T)
- On 01/18/96, R. Goornat pumped well USW G-2. The well was pumped to complete the environmental sampling. The well was pumped for about 100 minutes at 60 gallons per minute. Drawdown in the well was about 40 feet. Following completion of the environmental sampling Terry Grant told the USGS that the next scheduled pumping from G-2 would be following the receipt of the analysis of the samples from the lab. (T)
- On 01/18/96, R. Graves pumped well USW WT-10. The well was pumped from 0849 until 1441 at approximately 73 gallons per minute. Approximate drawdown was 1.03 feet. Approximate total volume of water discharged for 01/18/96 was 20,900 gallons. Chuck Savard completed the water-quality sampling at WT-10. (T)
- On 01/22/96, at well USW WT-10, R. Goornat and C. Savard made a water-level measurement and calibrated and removed Paroscientific transducer serial number 62269 from the well. The trailer used at the site was removed and returned to the HRF. Also removed from the site was Campbell scientific CR10 data logger serial number 6242, storage module SM718 serial number 4500, Setra 270 barometer serial number 385846, 50-gallon bucket #5, and McCrometer MW503 flowmeter serial number 595. During this site visit it was noted that the transducer cable had been disconnected on 01/19/96, while the drillers were emptying the Baker Tank and disassembling the discharge line at the site. Because the transducer cable was disconnected, no water-level data was collected for well WT-10 from about 1230 on 01/19/96 until the USGS site visit on 01/22/96. (T)
- On 01/23/96, R. Goornat and C. Savard moved the trailer from the HRF up to well USW G-2. (T)
- On 01/30/96, R. Goornat and C. Savard pumped well USW G-2 from 1000 to 1530 at approximately 59 gallons per minute. Approximate drawdown was 49.63 feet. Approximate total volume of water discharged for 01/30/96 was 19,470 gallons. Chuck Savard completed the initial water-quality sampling at G-2.

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USGS

- On 01/31/96, R. Goemaat and C. Savard pumped well USW G-2 from 0859 to 1500. Because of changes to the discharge line and sprinkler system during the time the pump was on, exact discharge data is not known. Discharge is estimated to have ranged from 36 to 60 gallons per minute. Approximate drawdown at 1500 was 47.41 feet. The total volume of water discharged for 01/31/96 is not known. Because of changes in the flow rate and back pressure on the discharge line, a fitting on the water-quality flow cell set up at the site blew off.
- G.M. O'Brien compiled all WT-10 pumping data into consistent format spreadsheet files, and plotted hydrographs of all pump data collected between 01/08/96 and 01/22/96.
- G.M. O'Brien reviewed the latest (01/05/96) work program issued by the M&O for USW G-2. O'Brien also updated all USW G-2 data-files and plotted hydrographs of all data collected during January 1996.

3GWF624 -- ANALYZE HYDRAULIC PROPERTIES OF WT-SERIES WELLS - PART I:

NONE

MILESTONES:

NONE.

C. Variances:

NONE.

III. Work performed that was charged to this Summary Account but which was not in direct support of the scheduled tasks:

Estimated hours spent: 80 hours

- G.M. O'Brien completed work on the SD-7 data package for pump tests conducted during March and August of 1995. The data package was given to Gary Patterson on 01/26/96 for review. The data summary sheet included examples of raw and processed data, water-quality data (pH, specific conductance, and temperature), and discharge data from the March tests (August discharge data are included in electronic files). The water quality data for the package was compiled by P. Sumner. All data (raw and spreadsheet data) were provided on diskettes in ASCII format. A summary type entry was also made in SD-7 SN#0086. (80 hours)

PROCESSED BY...