United States Department of the Interior
GEOLOGICAL SURVEY
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DENVER FEDERAL CENTER
DENVER, COLORADO 80225

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IN REPLY REFER TO:

INFORMATION ONLY

July 14, 1994

Vince Iorii
Yucca Mountain Site Characterization
Project Office
U. S. Department of Energy
P.O. Box 98608
Las Vegas, Nevada 89193-8608

SUBJECT: Yucca Mountain Project Branch - U.S. Geological Survey (YMPB-USGS) Progress Report, June 1994

Dear Vince:

Attached is the USGS progress report in the required format for the month of June, 1994.

If you have any questions or need further information, please call me or Raye Ritchey at (303)236-0516.

Sincerely,

for Raye P. Litchey
Larry R. Hayes
Technical Project Officer
Yucca Mountain Project Branch
U.S. Geological Survey

Enclosure:
cc: R. Crawley, DOE/Las Vegas
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R. Spence, DOE/Las Vegas
T. Sullivan, DOE/Las Vegas
M. Tynan, DOE/Las Vegas
D. Williams, DOE/Las Vegas
P. Justus, NRC/Las Vegas (2 copies)
P. Burke, M&O/Las Vegas
R. St. Clair, M&O/Las Vegas
D. Appel, USGS/Denver
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Robert Johnson from Las Vegas

#210-A

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U.S. Geological Survey
EXECUTIVE SUMMARY
June 1994

WBS 1.2.3.1 - Coordination and Planning

United States Geological Survey-Yucca Mountain Project Branch (USGS-YMPB) is currently processing 86 hydrologic-related scientific publications, 67 geologic and climate-related scientific publications, 12 USGS-LBL hydrologic-related scientific publications, and 97 abstracts.

WBS 1.2.3.2 - Geology

Work on the 3-D site-scale model, Topopah surface, continued with completion of a draft of the map used in the fault submodel that shows faults by categories of the amount of vertical separation. Also, the secondary fault model has been incorporated into the new model. The entire fault map has been digitized, elevations assigned, all secondary faults input, maps of the block-bounding faults subdivided from 305 m (1,000 ft) contours to 76 m (250 ft) contours to increase the density of generated triangles in the event more intersections become feasible within the Lynx software, and the secondary faults made into volume components. Work on digitizing of the Tiva Canyon structure contour map continues.

Lithostratigraphic data for the Calico Hills Formation and Prow Pass tuff, obtained from cores from selected boreholes, were given a final check and transferred to the LRC.

Surface-based geophysics staff completed additional gravity and magnetic measurements along several new lines crossing the Ghost Dance fault. About eight line-kilometers of new data were collected, located along three main lines and several short, secondary lines.

Geologic mapping of zonal features studies continued with checking of the measured reference section along the west face of Yucca Crest in Solitario Canyon and the collection of additional samples for selected mass spectrometry analyses.

At the Exploratory Studies Facility (ESF), 17 samples from the North Ramp drainage channel were obtained and submitted for trace-element analysis; results of the analyses will help confirm the stratigraphy of the drainage channel.

In seismic surface-reflection profiling studies, final processing of lines 1, 2, and 3 was completed, and final processing was performed on all remaining data. Deep reflectors along line 1 indicate that the Ghost Dance fault penetrates the entire section, about 1,220 m, and maintains about the same dip throughout.

In vertical seismic profiling (VSP) studies, final processing of the VSP data from USW WT-1 and USW NRG-6 was completed. Reflections were correlated with those from the surface reflection lines 1 and 2.

For the compilation of the historical earthquake record, approximately 10 nuclear explosion records for Tinemaha Station were examined and copied for wave-form comparison with early catalog events.

Current seismicity data were recorded by CUSP for all sites in June, except for 25 minutes of downtime. All of the June seismic events were picked; events through June 25, have been checked. The 44D network recorder was sent to the manufacturer for upgrade.

Studies to evaluate age and recurrence of movement on Quaternary faults continued. Laboratory analysis of cosmogenic ^{14}C was completed; all but two samples were saturated which indicates that Windy Wash and Solitario Canyon bedrock scarps have been exposed for greater than 20,000 years. A preliminary log of Trench T4 (south wall) on the Ghost Dance fault was completed prior to excavation. A new trench was excavated about 50 m south of Trench T4 and exposed deposits older than those found in T4. A new trench was excavated across the Ghost Dance fault on Whaleback Ridge; several Quaternary units were exposed above the fault that do not appear to be disturbed. A preliminary log of Trench CF1 on Fatigue Wash fault was completed and revised. Additional samples were collected at trench T8 on the Solitario Canyon fault for geochronologic dating. Samples were collected from trenches SCR-T1, SCR-T3, T8, BM-T1, and BM-2 for thermoluminescence and U-series analyses.

WBS 1.2.3.3 - Hydrology

Collection of synoptic weather data continued in the form of weather charts and weather satellite images. Lightening data also are being collected during storms. No precipitation was recorded at Yucca Mountain in June - this is not uncommon because June is the driest month of the year in southern Nevada. There was no runoff recorded or reported at any of the Yucca Mountain streamflow-monitoring sites on the Nevada Test Site. All streamflow and precipitation data collected to date in Water Year 1994 have been computed and checked.

Ponding and infiltration experiments continued in the Fortymile Wash recharge study. Additional data collected included: precipitation data from gages in Fortymile Canyon; neutron logs from UE-29 UZN #91 and #92; water-level measurements in UE-29a #1, #2, and UE-29 UZN #91.

In unsaturated zone infiltration studies, neutron-access holes UE-25 UZ#16 was logged with the gamma-gamma and neutron-neutron tools; caliper and single-point resistivity logs also were run. The neutron-neutron tool was configured with four different source-detector spacings to determine the optimal spacing. The data will be used to determine wet and dry density, porosity, moisture content, and borehole diameter as well as depth to bedrock.

Drilling continued as part of the unsaturated-zone studies with borehole USW SD-12 presently at a depth of about 312 m and borehole USW SD-9 presently at a depth of about 366 m.

At the Hydrologic Research Facility (HRF), an experiment was completed to determine the optimal source-detector spacing for the neutron-thermal neutron tool and to determine the correct detector distance. The tool was moved through a 4.6-m section of ODEX casing with different spacers. A 25-mm diameter by 25-mm length ring filled with water was attached to the casing and the casing covered with soil. The water-filled ring produced a known signature on the log at a known depth.

To characterize the physical properties of the unconsolidated surficial material, six soil samples were collected from Pagany Wash, five from Split Wash, 14 from Drill Hole Wash, 15 from the exposed profiles at the UE-25 NRG#5 drill pad, 12 from the Dune Wash, and three from the Busted Butte area. Samples will be analyzed for determination of field bulk density, rock and sand fraction, particle-size analysis, $CaCO_3$ content, and porosity and particle density measurements of the various size fractions. Results from all the analyses will be compiled into a database.

Regular monthly neutron logs were obtained in 97 holes in the natural infiltration monitoring network. Preliminary processing of the count data was completed, and the count data were entered into the historical neutron hole count database.

Air-permeability testing in USW NRG-7A has been substituted for USW NRG-6. The surface-based air-k support trailer was transported to the USW NRG-7A site and set up for testing, and all associated support equipment was transported to the site. Presently, gas sampling is being conducted in USW NRG-7A, and the air-k gas injection testing will begin in early July.

In order to identify the suspected source of contamination observed in analyses of USW UZ-14 waters, x-ray fluorescence analysis was completed on a sample of tool grease that is being used on the core stem of the LM-300 drill rig. Results indicate that this grease contains high levels of transition metals such as lead and zinc, as well as sulfur, and could represent the source of contamination that is being detected in the ground water.

The large-block, prototype ESF percolation experiment was restarted in June. Currently, water is flowing continuously through the block fractures at a rate less than 1 cm^3/hr. Average water pressure along the block top is between -21 and -18 cm of water. Measurements of water pressure in the block matrix and fracture are being made with tensiometers. Pressures along the top will be decreased until water flow stops, then increased until flow begins again to determine any hysteretic behavior that may affect water flow in fractures.

Monitoring of perched water in the ESF by other investigators was continued. To date, the starter tunnel has been drill and blasted to about 61 m. Alcove #1 has been excavated to final depth. Drilling of the three radial boreholes has been completed. No natural water flows have been encountered.

Gaseous-phase chemical investigations in the unsaturated zone continued. Samples were obtained from USW NRG-6 and NRG-7A and prepared for analyses of CO_2, CH_4, ^{13}C, and ^{14}C. The packer system was removed from UE-25 UZ#16, and preparations were begun for packer testing at borehole USW UZ-14.

As part of the aqueous-phase chemical investigations, a core sample from USW NRG-7A was compressed. water collected totaled 13.3 ml and gas collected was 10.7 ml. The extracted pore water will be analyzed for chemistry and ^{14}C. Two core samples from USW NRG-7A that had previously been squeezed using one-dimensional compression methods were distilled; the pore water will be analyzed for tritium, $^{18}O/^{16}O$ and D/H. Six cores from USW NRG-6 and three from USW NRG-7A were cut and prepared for one-dimensional pore-water extraction tests. Two cores from USW NRG-7A were compressed; both yielded more than about 17 ml of water.

As part of the evaluation of site potentiometric levels, 19 water-level zones were monitored in 17 wells on a monthly basis (manually) and 17 zones in 12 wells on an hourly basis (transducers). Continuous water-level data were obtained in four zones in two wells in order to monitor water-level responses to seismic events.

Real-time data were obtained from 17 zones in 12 wells using DCP's. Transducer data for wells USW H-5 and H-6 were converted to water levels; all transducer data for 1993 have now been converted to water-level altitudes.

WBS 1.2.3.6 - Climatology

As part of Paleoclimate studies of lake, playa, and marsh deposits, continued analyzing (counting) ostracode data from the late Holocene core taken from the southern Pahranagat Lake. There are 128 ostracode samples at 4 -m intervals throughout the 5-m core. Thirty-four isotope and six mollusc subsamples from lower Pahranagat Lake, Nevada were prepared; analyses will be used to establish the paleontological and isotopic climate and environmental history for the site. Ostracode and related materials from the Black Rock long core will be analyzed and results used to establish a geological (million year) scale climate-reference section to compare with the long-term history of fracture flow within the mountain.

WBS 1.2.3.7 - Resource Potential

Well and spring data for the water data base map were entered into a spreadsheet as part of the work on the Mineral Resource Assessment Base Map; the Ash Meadows Springs map was created which reveals the location and Sr levels for these springs.

WBS 1.2.12.2 - Information Management

The LRC received 369 individual records, 30 non-data criteria packages, 25 data packages, 19 publication packages, and one cited reference list. Current material transmitted to the CRF from the LRC included 116 individual records and 61 non-data criteria packages (924 pages), 14 publication packages, 23 data packages (5,119 pages), and 28 cited references (841 pages). Backlog material transmitted included no individual records, no data packages, 10 publication packages, and no backlog cited references (331 pages). The total pages transmitted for current and backlog material was 5,890 pages.

WBS 1.2.13 - Environment, Safety, and Health

In support of water-resources monitoring, ground-water levels were measured at 27 sites; discharge was measured at one flowing well. Ground-water data collected during June were checked and filed.

USGS LEVEL 3 MILESTONE REPORT
OCTOBER 1, 1993 - JUNE 30, 1994
Sorted by Baseline Date

Deliverable	Due Date	Expected Date	Completed Date	Comments
G300: FINAL RPT, CROSS-HOLE PROTOTYPE TESTING Milestone Number: 3GUT004M	03/31/93	07/29/94		
PUBLICATION: RAILROAD VALLEY ANALOG Milestone Number: 3GNR02AM	09/30/93	07/29/94		
PUBLICATION: DEVELOPMENT OF 1-D COMPRESSION Milestone Number: 3GUH045M	01/31/94	08/31/94		
PUBLICATION: FY92 DATA FROM ANALOG RECHARGE SITE Milestone Number: 3GQH12CM	01/31/94	06/07/94	06/07/94	
ANALYSIS PAPER: UZ-16 COMPLETION REPORT (P013) Milestone Number: 3GUP066M	02/01/94	09/30/94		
ANLYS PAPER: LAB MEASUREMENT OF UNSATURATED FLOW Milestone Number: 3GUS034M	02/04/94	08/31/94		
ANALYSIS PPR: DATA-STARTER TUNNEL & NORTH PORTAL Milestone Number: 3GGF012M	02/28/94	07/29/94		
CRITERIA LETTER: TECH SUPPORT FOR X-HOLE TESTING Milestone Number: 3GWF086M	02/28/94	09/30/94		
ANLYS PPR: MAG/GRAV INTERP YUC WASH/MDWAY VALLEY Milestone Number: 3GGU463M	03/31/94	07/29/94		
ANLYS PPR: MAPS SOUTH-CNTRL GHOST DANCE FAULT Milestone Number: 3GGF122M	03/31/94	07/29/94		
PUB: STRUCTURAL FLOW-PATH ANLYS W/TRANSPT & CHEM Milestone Number: 3GFH009M	03/31/94	08/31/94		
PUBLICATN: RESULTS - ZERO OFFSET & WALKAWAY DATA Milestone Number: 3GUP086M	03/31/94	07/29/94		

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Deliverable	Due Date	Expected Date	Completed Date	Comments
PUB: INTRABOREHOLE FLOW AND STRESS TEST (P891) Milestone Number: 3GWF010M	03/31/94	06/07/94	06/07/94	
PUBLICATION: GEOPHYSICAL STUDY/WINDY WASH FAULT Milestone Number: 3GPF039M	04/15/94	07/29/94		
ANALYSIS PPR: MAG/GRAV ACROSS GHOST DANCE FAULT Milestone Number: 3GGU440M	04/29/94	07/29/94		
PUBLICATION: ASSESS LITTLE SKULL MTN EQ Milestone Number: 3GSM149M	04/29/94	07/29/94		
PUBLICATION: STREAMFLOW & PRECIP DATA FY91-93 Milestone Number: 3GRS033M	04/29/94	06/30/94	06/30/94	
PUBLICATION: INFILT STUDY; DEVELOPMENT/TESTING Milestone Number: 3GUI636M	04/29/94	07/29/94		
PUBLICATION: 1-D AND 2-D MATRIX MODELS Milestone Number: 3GPA006M	04/29/94	08/31/94		
PUBLICATION: MAP - CRATER FLAT Milestone Number: 3GTD012M	04/30/94	07/29/94		
ANLYS PPR: ISOTOPIC PARAMETERS- DRILLCORE SECTNS Milestone Number: 3GGU22BM	05/31/94	09/30/94		
ANLYS PPR: MAP-GHOST DANCE FAULT PAVEMENT Milestone Number: 3GGF202M	05/31/94	07/29/94		
PUBLICATION: FINAL SUMMARY RPT - MIDWAY VALLEY Milestone Number: 3GFP029M	05/31/94	09/30/94		
PUBLICATION: MAP - CALICO HILLS Milestone Number: 3GTD018M	05/31/94	07/29/94		
PUBLICATION: MAP- EAST OF BEATTY QUADRANGLE Milestone Number: 3GTD028M	05/31/94	07/29/94		

Deliverable	Due Date	Expected Date	Completed Date	Comments
ANLYS PPR: SCARP DEGRADATION/EVOL N. WINDY WASH Milestone Number: 3GPF034M	05/31/94	08/16/94		
PUBLICATION: STAGE COACH RD FAULT Milestone Number: 3GPF118M	05/31/94	09/30/94		
ANALYSIS PPR: TRACE ELEMENT/RADIOGENIC-ISOTOPE Milestone Number: 3GGU122M	06/30/94	06/30/94	06/30/94	
PUBLICATION: STREAMFLOW CHAOS JOURNAL ARTICLE Milestone Number: 3GRG023M	06/30/94	09/30/94		
PUBLICATION: HISTORICAL NEUTRON HOLE DATA Milestone Number: 3GUI050M	06/30/94	09/30/94		
PUB: PROJECTION MOIRE METHOD - FRACT-SURF CHAR Milestone Number: 3GUS024M	06/30/94	08/31/94		
PUBLICATION: ORIGIN OF SURFACE DEPOSITS Milestone Number: 3GQH019M	06/30/94	08/31/94		
ANLYS PPR:ALTERATIONS IN CORE FROM UZ-14 & UZ-16 Milestone Number: 3GNR020M	06/30/94	07/29/94		
PUBLICATION: LITHOSTRATIGRAPHIC CRITERIA Milestone Number: 3GGU130M	07/15/94	07/15/94		
ANALYSIS PAPER: LITHOLOGIC LOGGING - PHASE 2 Milestone Number: 3GGU31AM	07/15/94	07/15/94		
ANLYS PPR: 3-D SITE-SCALE MODEL/TOPOPAH-SURFACE Milestone Number: 3GGU135M	07/29/94	08/31/94		
ANALYSIS PAPER: SEISMIC REFLECTION PROFILE EVAL Milestone Number: 3GGU256M	07/29/94	09/30/94		
ANALYSIS PAPER: PRELIMINARY WT/UZ-14 MAG RESULTS Milestone Number: 3GGU399M	07/29/94	07/29/94		

Deliverable	Due Date	Expected Date	Completed Date	Comments
ANALYSIS PPR: PROGRESS GEOCHEM REFERENCE SECTION Milestone Number: 3GGF206M	07/29/94	07/29/94		
ANLYS PPR:LITH\CHEM PROP WELD/BEDDED PBRUSH\TUFF Milestone Number: 3GGF207M	07/29/94	07/29/94		
PUBLICATION: CATALOG OF SEISMIC EVENTS -CY 1993 Milestone Number: 3GSM025M	07/29/94	09/30/94		
ANLYS PPR: BASALTIC VOLC. BARE MTN-CRATER FLAT Milestone Number: 3GTD025M	07/29/94	07/29/94		
PUBLICATION: FY92 SYNOPTIC/REG/SITE MET DATA Milestone Number: 3GMM038M	07/29/94	09/30/94		
PUBLICATION: FY93 SYNOPTIC/REG/SITE MET DATA Milestone Number: 3GMM041M	07/29/94	09/30/94		
PUBLICATION: CRATER FLAT TUFF FRACTURE MAPPING Milestone Number: 3GWM013M	07/29/94	07/29/94		
ANLYS PPR: MAP-REGIONAL VARIATION-TIVA CYN TUFFS Milestone Number: 3GNR032M	07/29/94	07/29/94		
LETTER REPORT: GROUND-WATER DATA 3RD QTR FY94 Milestone Number: 3GWR042M	07/29/94	07/29/94		
ANALYSIS PAPER: BOREHOLE COMPLETION DATA REPORT Milestone Number: 3GUP302M	07/30/94	09/30/94		

USGS LEVEL 4 MILESTONE REPORT
OCTOBER 1, 1993 - JUNE 30, 1994
Sorted by Baseline Date

Deliverable	Due Date	Expected Date	Completed Date	Comments
PROV. RESULTS:ISOTOPE DATING/EOLIAN SANDS/SOIL Milestone Number: 3GCH161M	08/31/93	08/30/94		
PRELIMINARY SUMMARY PALEOFLOOD STUDIES Milestone Number: 3GQH010M	09/30/93	09/30/94		
REVIEW DRAFT: SUMMARY REPORT - MIDWAY VALLEY Milestone Number: 3GFP028M	01/20/94	07/29/94		
DATA TO LRC: TRENCH LOGS Milestone Number: 3GFP017M	02/21/94	07/29/94		
PROV. RESULTS: EVAL. MODEL ON SECONDARY CALCITE Milestone Number: 3GQH868M	03/11/94	06/17/94	06/17/94	
REVIEW DRAFT: TRENCHES STAGE COACH RD FLT Milestone Number: 3GPF117M	03/15/94	07/18/94		
REVIEW DRAFT: CATALOG OF EVENTS CAL YEAR 1993 Milestone Number: 3GSM024M	03/31/94	07/29/94		
DATA TO LRC: SEISMIC DATA Milestone Number: 3GSM24AM	03/31/94	07/29/94		
DATA TO LRC: UE-25 UZ#16 AIR-K DATA Milestone Number: 3GUP039M	03/31/94	07/15/94		
DATA TO LRC: FRACTURE LOGS DATA Milestone Number: 3GUP305M	03/31/94	11/30/94		
DATA TO LRC: GAS/H20 VAPOR DATA-UZ#16/NRG-6/UZ-1 Milestone Number: 3GUH022M	03/31/94	09/30/94		
SELECT SEISMIC CONTRACTOR(S) Milestone Number: 3GGU265M	04/29/94	08/05/94		

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Deliverable	Due Date	Expected Date	Completed Date	Comments
DATA TO LRC:FY93 SYNOPTIC/REGIONAL/SITE MET DATA Milestone Number: 3GMM039M	04/29/94	07/29/94		
DATA TO LRC: FY93 MATRIX PROPERTIES DATA Milestone Number: 3GUP034M	04/29/94	07/15/94		
TECHNICAL MEMO: APR-1 FRACTURE DATA Milestone Number: 3GGF120M	05/23/94	07/29/94		
REVIEW DRAFT: MAP- BIG DUNE QUADRANGLE Milestone Number: 3GTD029M	05/31/94	07/29/94		
PROVISIONAL RESULTS: 14 C/D TRENCH STUDIES Milestone Number: 3GPF036M	05/31/94	06/07/94	06/07/94	
TECH PROCEDURE: COLLECT GEOLOGIC DATA (LEVEL 4) Milestone Number: 3GGF60BM	06/30/94	06/30/94	06/30/94	
DATA TO LRC: QUADRILATERAL SURVEY Milestone Number: 3GTL009M	06/30/94	11/30/94		
REVIEW DRAFT: PRELIMINARY TECTONIC MODEL Milestone Number: 3GTE061M	06/30/94	06/30/94	06/30/94	
MEMO TO TPO: INSTUMENTATION CERTIF FOR NRG-6 Milestone Number: 3GUP072M	06/30/94	12/15/94		
DATA TO LRC: AXIAL FRACTURE BLANK TEST RESULTS Milestone Number: 3GUS032M	06/30/94	08/31/94		
REVIEW DRAFT: GAS CHEMISTRY Milestone Number: 3GGP005M	06/30/94	06/30/94	06/30/94	
DATA TO LRC: 1ST & 2ND QTR FY94 GAS FLOW DATA Milestone Number: 3GGP03M	06/30/94	08/31/94		
DATA TO LRC: 1ST & 2ND QTR FY94 GAS SAMPLE DATA Milestone Number: 3GGP05M	06/30/94	08/31/94		

Deliverable	Due Date	Expected Date	Completed Date	Comments
DATA TO LRC: 1ST & 2ND QTR FY94 TRACER TEST DATA Milestone Number: 3GGP07M	06/30/94	07/15/94		
DATA TO LRC: HYDRAULIC DATA Milestone Number: 3GWF020M	06/30/94	07/29/94		
DATA TO LRC: LIMITED SITE HYDROCHEMISTRY DATA Milestone Number: 3GWH008M	06/30/94	07/29/94		
PROVISIONAL RESULTS: STATUS OF CONCEPTUAL MODEL Milestone Number: 3GWM018M	06/30/94	06/20/94	06/20/94	
ABSTRACT: ORIGIN OF SECONDARY CALCITE IN UZ -YM Milestone Number: 3GQH866M	06/30/94	07/06/94		
PREP: TBM MAPPING PREPARATION (LEVEL 4) Milestone Number: 3GGF50BM	07/29/94	07/29/94		
REVIEW DRAFT: STRUCT CONTROLS/BASALTIC VOLCANISM Milestone Number: 3GTW015M	07/29/94	07/29/94		
DATA TO LRC:PRELIM TBL FLT PARAMS REL EQs-V. IV Milestone Number: 3GSS114M	07/29/94	07/29/94		
PROV RESULTS: CONFERENCE ON GROUND MOTION Milestone Number: 3GES006M	07/29/94	07/29/94		
DATA TO LRC: ROCK VALLEY TRENCH LOGS Milestone Number: 3GTN016M	07/29/94	12/02/94		
PROV RESULTS: HISTORY OF FATIGUE WASH FAULT Milestone Number: 3GPF105M	07/29/94	07/29/94		
PROVISIONAL RESULTS: COSMOGENIC DATING RESULTS Milestone Number: 3GPF116M	07/29/94	07/29/94		
STREAM-GAGE INSTALLATION MEMO Milestone Number: 3GRS018M	07/29/94	07/29/94		

Deliverable	Due Date	Expected Date	Completed Date	Comments
DATA TO LRC: REGIONAL HYDROCHEMICAL DATA Milestone Number: 3GRG074M	07/29/94	07/29/94		
DRAFT REPORT: HYDROGEOLOGIC MAP OF DEATH VALLEY Milestone Number: 3GRM043M	07/29/94	08/26/94		
REVIEW DRAFT: TUFF MATRIX PROPERTIES Milestone Number: 3GUP035M	07/29/94	07/29/94		
MEMO TO TPO: INSTALLATION/INITIAL TEST OF INSTRU Milestone Number: 3GUP096M	07/29/94	09/01/94		
MEMO TO TPO:GAS SAMPLING SOFTWARE COMPLETION RPT Milestone Number: 3GUP102M	07/29/94	07/29/94		
AXIAL INTACT FRACTURE SAMPLING METHODS (TP) Milestone Number: 3GUS029M	07/29/94	07/29/94		
DATA TO LRC: SINGLE-HOLE REDUCED DATA Milestone Number: 3GUS422M	07/29/94	09/30/94		
MEMO TO TPO:STATUS OF BUILD/CALIBRATE/TEST EQUIP Milestone Number: 3GUS009M	07/29/94	07/29/94		
REVIEW DRAFT: TRACER-GAS SORPTION ON STEM/TUFF Milestone Number: 3GUH027M	07/29/94	07/29/94		
DATA TO LRC: SECOND QUARTER WATER-LEVEL DATA Milestone Number: 3GWF052M	07/29/94	07/29/94		
PROV RLTS: HYDRAULIC X-HOLE TEST PROGRAM TO DATE Milestone Number: 3GWF012M	07/29/94	11/08/94		
DATA TO LRC: FRACTURE FILLING DATA Milestone Number: 3GWM010M	07/29/94	07/29/94		
PROVISIONAL RESULTS: DUPLICATE ANALYSIS COMPARSN Milestone Number: 3GCL120M	07/29/94	07/29/94		

Deliverable	Due Date	Expected Date	Completed Date	Comments
PROVISIONAL RESULTS: RADIOCARBON DATING RESULTS Milestone Number: 3GCL130M	07/31/94	07/29/94		
REVIEW DRAFT: SURFICIAL DEPOSITS MAP C. 1/3 YM Milestone Number: 3GCH055M	07/31/94	07/29/94		
PROV RESULTS: SAMPLES-TRENCHES & DRILL HOLES Milestone Number: 3GQH026M	07/31/94	09/30/94		
PROVISIONAL RESULTS: PHYS/MINERAL/PETRO DESCRIPT Milestone Number: 3GQH18M	07/31/94	07/29/94		
PROVISIONAL RESULTS: ISOTOP COMP/FLUID INCLUSION Milestone Number: 3GQH852M	07/31/94	07/29/94		

Prepared - 07/14/94:09:48:52 | WBS Status Sheet (WBS02) | Inc. Dollars in Thousands

WBS No. - 1.2 | WBS Manager -

WBS Title - YUCCA MOUNTAIN PROJECT

Parent WBS No. - | Parent WBS Manager -

Parent WBS Title -

Statement of Work

See the current WBS Dictionary

Cost/Schedule Performance

Id	Description	Current Period BCWS	BCWP	ACWP	SV	CV	FY1994 Cumulative to Date BCWS	BCWP	ACWP	SV	CV	FY1994 at Completion BAC	EAC	VAC
1.2.1	SYSTEMS ENGINEERING	5	5	11	0	-6	46	46	49	0	-3	62	62	0
1.2.3	SITE INVESTIGATIONS	1966	1740	2013	-226	-273	14665	13675	14113	-990	-438	21646	22981	-1335
1.2.5	REGULATORY	99	99	90	0	9	894	897	824	3	73	1194	1213	-19
1.2.9	PROJECT MANAGEMENT	121	121	89	0	32	862	862	807	0	55	1225	1225	0
1.2.11	QUALITY ASSURANCE	159	159	170	0	-11	1423	1423	1474	0	-51	1900	1932	-32
1.2.12	INFORMATION MANAGEMENT	42	42	70	0	-28	375	375	378	0	-3	530	530	0
1.2.13	ENVIRONMENT, SAFETY, & HEA	52	52	72	0	-20	324	324	334	0	-10	483	499	-16
1.2.15	SUPPORT SERVICES	24	24	24	0	0	215	215	191	0	24	287	276	11
Total		2468	2242	2539	-226	-297	18804	17817	18170	-987	-353	27327	28718	-1391

Resource Distributions by Element of Cost

Fiscal Year 1994

Budgeted Cost of Work Scheduled

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
LBRHRS	17618	18011	18747	20608	20170	21181	25516	29668	29646	28025	26464	26355	282009
LABOR	971	1037	1207	1272	1273	1368	1634	1648	1638	1569	1627	1765	17009
SUBS	588	624	696	790	758	667	770	746	733	710	991	694	8767
CAPITAL	0	0	197	41	0	0	0	49	97	590	0	577	1551
Total BCWS	1559	1661	2100	2103	2031	2035	2404	2443	2468	2869	2618	3036	27327

Actual Cost of Work Performed

LBRHRS	11856	12411	12139	14734	18465	18096	16085	15265	16439	0	0	0	135490
LABOR	713	832	1588	1272	1102	1284	1597	1240	1561	0	0	0	11189
SUBS	583	652	685	782	664	809	755	799	833	0	0	0	6562
CAPITAL	4	0	185	29	23	0	1	32	145	0	0	0	419
Total ACWP	1300	1484	2458	2083	1789	2093	2353	2071	2539	0	0	0	18170

Inc. Dollars in Thousands

WBS No. - 1.2 -YUCCA MOUNTAIN PROJECT

Resource Distributions

Fiscal Year 1994	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
BCWS	1559	1661	2100	2103	2031	2035	2404	2443	2468	2869	2618	3036	27327
BCWP	1532	1647	1943	2116	1764	2134	2209	2230	2242	0	0	0	17817
ACWP	1300	1484	2458	2083	1789	2093	2353	2071	2539	0	0	0	18170
ETC	0	0	0	0	0	0	0	0	0	3103	3322	4123	10548

Fiscal Year Distribution

	Prior	FY1994	FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	Future	At Complete
BCWS	24644	27327	51462	48901	42359	29995	19018	9564	5128	97	0	0	258495
BCWP	23158	17817	0	0	0	0	0	0	0	0	0	0	
ACWP	23430	18170	0	0	0	0	0	0	0	0	0	0	
ETC	0	10548	50954	48391	42120	29660	18703	9770	5048	2262	0	0	259056

YMP PLANNING AND CONTROL SYSTEM (PACS)

Participant U.S. Geological Survey

MONTHLY COST/FTE REPORT

Fical Month/Year JUNE 1994

Date Prepared 07/12/94 11:03

Page 1 of 1

	CURRENT MONTH END						FISCAL YEAR		
WBS ELEMENT	ACTUAL COSTS	PARTICIPANT HOURS	SUBCON HOURS	PURCHASE COMMITMENTS	SUBCON COMMITMENTS	ACCRUED COSTS	APPROVED BUDGET	APPROVED FUNDS	CUMMULATIVE COSTS
1.2.1	11	104	0	0	0		62		49
1.2.3	1877	13807	11071	196	1899		20950		13715
1.2.5	91	1226	567	0	78		1171		802
1.2.9	92	660	551	0	106		1225		807
1.2.11	174	934	1706	0	219		1900		1474
1.2.12	71	0	1130	0	132		530		378
1.2.13	72	176	0	0	0		483		334
1.2.15	24	0	395	0	49		287		191
TOTALS	2412	16907	15420	196	2483		26608	0	17750

U.S. GEOLOGICAL SURVEY

ESTIMATED COSTS FOR 10/1/93 - 06/30/94

		OCT EST	NOV EST	DEC EST	JAN EST	FEB EST	MAR EST	APR EST	MAY EST	JUN EST	JUL EST	AUG EST	SEP EST	TOTAL
0G1194B	Q-List Development and Maintenance	0.6	1.5	9.2	1.3	7.0	5.1	7.2	6.0	11.2	0.0	0.0	0.0	49.1
1.2.1.10		0.6	1.5	9.2	1.3	7.0	5.1	7.2	6.0	11.2	0.0	0.0	0.0	49.1
*1.2.1.1		0.6	1.5	9.2	1.3	7.0	5.1	7.2	6.0	11.2	0.0	0.0	0.0	49.1
**1.2.1		0.6	1.5	9.2	1.3	7.0	5.1	7.2	6.0	11.2	0.0	0.0	0.0	49.1
0G3194B1	Branch Coordination and Planning	31.0	41.7	59.2	29.3	44.0	36.5	85.4	-30.8	37.2	0.0	0.0	0.0	333.5
0G3194B2	M&I - Branch Administrative Services	28.7	14.7	81.4	12.5	18.8	56.2	48.1	36.2	45.2	0.0	0.0	0.0	341.8
0G3194G1	Geologic Studies Program Management	22.9	27.8	38.5	58.0	58.3	5.4	19.3	26.6	35.3	0.0	0.0	0.0	292.1
0G3194G2	QA Implementation GSP	20.5	21.3	16.2	20.9	16.1	23.1	20.4	22.5	19.3	0.0	0.0	0.0	1[illegible]
0G3194H1	Hydrology Program Management	35.2	33.3	88.0	40.2	36.3	-4.5	54.3	103.5	57.0	0.0	0.0	0.0	4[illegible]
0G3194H2	QA Implementation, Hydrology	13.0	13.5	20.5	8.6	10.8	17.4	15.2	9.6	31.7	0.0	0.0	0.0	140.3
0G3194H3	Computer Operation & Data Mgmt Hydrology	26.3	28.0	53.7	31.8	28.8	35.7	35.5	43.7	34.7	0.0	0.0	0.0	318.2
0G3194H4	Scientific Rpts/Proj Documents Hydrology	7.1	8.4	11.6	6.1	7.1	7.1	6.5	6.9	9.3	0.0	0.0	0.0	70.1
1.2.3.1		184.7	188.7	369.1	207.4	220.2	176.9	284.7	218.2	269.7	0.0	0.0	0.0	2119.6
*1.2.3.1		184.7	188.7	369.1	207.4	220.2	176.9	284.7	218.2	269.7	0.0	0.0	0.0	2119.6
0G32211A94	Surface/Subsurface Stratigraphic Studies	52.3	61.2	82.3	77.7	75.0	128.0	87.3	49.2	136.8	0.0	0.0	0.0	749.8
0G32211B94	Surface-Based Geophysical Surveys	0.0	0.9	1.5	53.9	26.6	23.4	15.9	0.6	9.7	0.0	0.0	0.0	132.5
0G32211C94	Borehole Geophysical Surveys	0.0	0.0	6.4	58.9	21.4	16.8	-29.4	-2.0	38.0	0.0	0.0	0.0	110.1
1.2.3.2.2.1.1		52.3	62.1	90.2	190.5	123.0	168.2	73.8	47.8	184.5	0.0	0.0	0.0	992.4
0G32212A94	Geologic Mapping of Zonal Features	61.7	83.1	80.1	77.8	64.3	79.5	54.3	87.2	73.0	0.0	0.0	0.0	661.0
0G32212B94	Surface-fracture Network Studies	0.0	0.0	13.9	0.6	21.7	1.1	6.5	6.3	4.5	0.0	0.0	0.0	54.6
0G32212D94	Geologic Mapping of the ES and Drifts	31.5	30.6	65.4	44.9	49.7	60.5	56.5	57.2	58.7	0.0	0.0	0.0	455.0
1.2.3.2.2.1.2		93.2	113.7	159.4	123.3	135.7	141.1	117.3	150.7	136.2	0.0	0.0	0.0	1170.6
0G32531A94	Tectonic Effects	4.0	2.0	7.4	-3.3	0.6	3.8	-0.2	0.3	5.1	0.0	0.0	0.0	19.7
1.2.3.2.5.3.1		4.0	2.0	7.4	-3.3	0.6	3.8	-0.2	0.3	5.1	0.0	0.0	0.0	19.7
0G32552C94	Heat Flow at Yucca Mountain	0.0	0.0	0.0	21.9	0.0	0.0	26.1	0.0	0.4	0.0	0.0	0.0	[illegible]
1.2.3.2.5.5.2		0.0	0.0	0.0	21.9	0.0	0.0	26.1	0.0	0.4	0.0	0.0	0.0	48.4
0G32621A94	Surface Facilities Exploration Program	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	4.6
1.2.3.2.6.2.1		0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	4.6
0G32831A94	Identify Relevant Earthquake Sources	4.6	9.0	10.4	-5.0	4.1	14.6	6.5	15.8	10.1	0.0	0.0	0.0	70.1
0G32831B94	Characterize 10,000-yr Slip Earthquakes	0.0	0.0	0.0	32.7	-3.5	18.7	-14.5	1.0	23.8	0.0	0.0	0.0	58.2
1.2.3.2.8.3.1		4.6	9.0	10.4	27.7	0.6	33.3	-8.0	16.8	33.9	0.0	0.0	0.0	128.3
0G32833A94	Empirical Earthquake Model	0.6	0.2	-0.8	20.0	0.0	8.7	2.5	0.0	8.0	0.0	0.0	0.0	39.2
1.2.3.2.8.3.3		0.6	0.2	-0.8	20.0	0.0	8.7	2.5	0.0	8.0	0.0	0.0	0.0	39.2
0G32834A94	Site Effects from Ground-Motion	0.0	0.0	14.5	6.2	-18.4	17.7	5.0	1.5	11.7	0.0	0.0	0.0	38.2
1.2.3.2.8.3.4		0.0	0.0	14.5	6.2	-18.4	17.7	5.0	1.5	11.7	0.0	0.0	0.0	38.2
0G32841A94	Compile Historical Earthquake Record	0.8	0.0	1.0	2.6	1.0	28.6	15.0	2.4	28.7	0.0	0.0	0.0	80.1
0G32841B94	Monitor Current Seismicity	80.0	109.8	102.8	115.5	121.3	67.2	117.6	90.8	87.1	0.0	0.0	0.0	892.1

U.S. GEOLOGICAL SURVEY

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	OCT EST	NOV EST	DEC EST	JAN EST	FEB EST	MAR EST	APR EST	MAY EST	JUN EST	JUL EST	AUG EST	SEP EST	TOTAL
1.2.3.2.8.4.1	80.8	109.8	103.8	118.1	122.3	95.8	132.6	93.2	115.8	0.0	0.0	0.0	972.2
0G32842B94 Conduct Expl. Trenching in Midway Valley	0.0	0.0	0.0	105.0	15.9	5.5	11.9	1.4	-19.7	0.0	0.0	0.0	120.0
1.2.3.2.8.4.2	0.0	0.0	0.0	105.0	15.9	5.5	11.9	1.4	-19.7	0.0	0.0	0.0	120.0
0G32843B94 Eval Quaternary faults w/i 100 km of YM	13.2	26.4	14.6	6.0	37.7	22.6	10.8	26.7	13.5	0.0	0.0	0.0	171.5
0G32843D94 Evaluate Bare Mountain Fault Zone	21.6	26.3	25.5	13.1	8.7	16.0	2.6	10.2	3.4	0.0	0.0	0.0	127.4
1.2.3.2.8.4.3	34.8	52.7	40.1	19.1	46.4	38.6	13.4	36.9	16.9	0.0	0.0	0.0	298.9
0G32844A94 Evaluate the Rock Valley Fault System	6.9	19.4	9.8	17.5	-0.4	-0.9	5.1	7.1	29.6	0.0	0.0	0.0	94.1
0G32844B94 Evaluate the Mine Mountain Fault System	0.0	6.8	-6.8	1.0	0.0	-1.0	4.3	1.9	2.6	0.0	0.0	0.0	[illegible]
1.2.3.2.8.4.4	6.9	26.2	3.0	18.5	-0.4	-1.9	9.4	9.0	32.2	0.0	0.0	0.0	[illegible]
0G32845B94 Evaluate Postulated Detachment Faults	3.4	2.2	13.1	30.9	-12.8	12.2	9.5	12.7	14.5	0.0	0.0	0.0	85.7
0G32845C94 Evaluate Potential Relationship of Brecc	0.0	0.0	2.6	0.8	5.7	1.3	0.8	0.1	0.0	0.0	0.0	0.0	11.3
0G32845D94 Evaluate Postulated Detachment Faults	0.0	0.0	0.0	0.0	0.0	0.2	0.3	1.1	4.4	0.0	0.0	0.0	6.0
0G32845E94 Eval Age of Detachment Faults - Radiomet	0.0	0.0	0.0	0.0	0.0	0.0	3.6	6.7	14.0	0.0	0.0	0.0	24.3
1.2.3.2.8.4.5	3.4	2.2	15.7	31.7	-7.1	13.7	14.2	20.6	32.9	0.0	0.0	0.0	127.3
0G32846B94 Evaluate Age and Recurrence of Movement	21.1	3.2	47.9	26.9	49.5	40.5	26.9	101.9	31.6	0.0	0.0	0.0	349.5
1.2.3.2.8.4.6	21.1	3.2	47.9	26.9	49.5	40.5	26.9	101.9	31.6	0.0	0.0	0.0	349.5
0G3284AA94 Relevel Base-Station Network, YM	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.0	15.0	0.0	0.0	0.0	20.0
1.2.3.2.8.4.10	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.0	15.0	0.0	0.0	0.0	20.0
0G3284CA94 Eval Tectonic Process/Stability at Site	0.0	0.0	2.2	10.1	15.6	6.4	-14.7	-7.7	2.0	0.0	0.0	0.0	13.9
0G3284CB94 Evaluate Tectonic Models	0.0	0.6	1.7	-1.3	5.8	29.2	24.2	26.3	17.6	0.0	0.0	0.0	104.1
1.2.3.2.8.4.12	0.0	0.6	3.9	8.8	21.4	35.6	9.5	18.6	19.6	0.0	0.0	0.0	118.0
*1.2.3.2	301.7	381.7	495.5	714.4	489.5	600.6	442.0	500.7	624.1	0.0	0.0	0.0	4550.2
0G33111A94 Precipitation/Meteorological Monitoring	10.7	12.7	24.7	12.7	7.0	18.7	23.5	36.5	11.6	0.0	0.0	0.0	158.1
1.2.3.3.1.1.1	10.7	12.7	24.7	12.7	7.0	18.7	23.5	36.5	11.6	0.0	0.0	0.0	158.1
0G33112A94 Surface-Water Runoff Monitoring	25.3	33.2	37.2	33.8	32.0	24.6	21.8	20.7	103.7	0.0	0.0	0.0	[illegible]
1.2.3.3.1.1.2	25.3	33.2	37.2	33.8	32.0	24.6	21.8	20.7	103.7	0.0	0.0	0.0	332.3
0G33113B94 Regional Potentiometric Level Distributi	5.4	6.7	4.1	7.9	4.0	3.0	3.9	4.2	8.9	0.0	0.0	0.0	48.1
0G33113C94 Fortymile Wash Recharge Study	5.6	5.2	8.7	3.4	5.7	6.0	5.6	5.7	5.8	0.0	0.0	0.0	51.7
1.2.3.3.1.1.3	11.0	11.9	12.8	11.3	9.7	9.0	9.5	9.9	14.7	0.0	0.0	0.0	99.8
0G33114B94 Subregional Two-Dimensional Areal Hydrol	0.0	0.0	0.0	1.8	1.5	6.0	5.6	3.4	-0.4	0.0	0.0	0.0	17.9
0G33114D94 Regional 3-D Hydrology Modeling	3.9	5.3	10.6	7.3	6.5	6.4	8.1	9.3	30.1	0.0	0.0	0.0	87.5
1.2.3.3.1.1.4	3.9	5.3	10.6	9.1	8.0	12.4	13.7	12.7	29.7	0.0	0.0	0.0	105.4
0G33121A94 Char Hydr Prop of Surficial Material	25.7	28.0	20.0	20.5	9.7	21.4	24.5	10.6	36.4	0.0	0.0	0.0	196.8
0G33121B94 Evaluation of Natural Infiltration	5.1	49.7	52.5	19.2	26.3	51.5	40.6	28.6	27.0	0.0	0.0	0.0	300.5
0G33121C94 Evaluation of Artificial Infiltration	0.0	0.0	12.0	13.3	12.9	10.0	42.7	17.7	10.7	0.0	0.0	0.0	119.3
1.2.3.3.1.2.1	30.8	77.7	84.5	53.0	48.9	82.9	107.8	56.9	74.1	0.0	0.0	0.0	616.6
0G33123A94 Matrix Hydrologic-Properties Testing	13.1	29.9	38.7	59.0	-29.3	41.3	43.4	23.0	17.5	0.0	0.0	0.0	236.6

U.S. GEOLOGICAL SURVEY

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0G33123B94	Surface-Based Borehole Studies	57.7	59.1	101.8	143.7	78.0	152.1	223.2	201.0	198.5	0.0	0.0	0.0	1215.1
0G33123C94	Vertical Seismic Profiling	5.7	12.9	38.6	-1.5	11.7	20.8	27.0	17.9	32.8	0.0	0.0	0.0	165.9
0G33123D94	Integrated Data Acquisition System	24.3	26.8	27.1	19.7	38.3	24.3	28.4	35.8	13.1	0.0	0.0	0.0	237.8
0G33123E94	Air-Permeability/Gaseous-Tracer Testing	16.8	19.7	22.4	28.9	60.0	27.1	52.0	9.8	29.6	0.0	0.0	0.0	266.3
0G33123F94	USW UZ-14 Support	33.8	12.6	20.7	4.6	13.3	27.2	37.1	37.7	27.6	0.0	0.0	0.0	214.6
1.2.3.3.1.2.3		151.4	161.0	249.3	254.4	172.0	292.8	411.1	325.2	319.1	0.0	0.0	0.0	2336.3
0G33124A94	Prototype Testing of Intact Fractures	22.0	32.4	36.7	37.3	27.8	37.8	45.5	40.5	31.3	0.0	0.0	0.0	311.3
0G33124B94	Prototype Infiltration Testing	9.3	14.6	19.8	12.2	8.7	10.1	12.4	7.1	12.5	0.0	0.0	0.0	106.7
0G33124D94	Radial Borehole Testing	0.0	0.0	8.6	32.0	40.6	23.0	114.1	46.6	26.9	0.0	0.0	0.0	2
0G33124E94	Prototype Excavation Effects Testing	7.8	10.4	13.3	3.9	4.0	13.0	24.9	23.3	26.5	0.0	0.0	0.0	127.1
0G33124G94	Prototype Perched-Water Testing	0.0	0.0	4.0	1.3	1.1	5.3	2.6	5.4	1.3	0.0	0.0	0.0	21.0
0G33124H94	Hydrochemistry tests in the ESF	6.0	7.7	8.7	5.7	0.5	16.5	9.9	14.4	7.6	0.0	0.0	0.0	77.0
0G33124J94	Major Faults in the ESF	9.8	7.4	17.7	-3.0	-1.6	4.7	-2.4	0.0	0.0	0.0	0.0	0.0	32.6
1.2.3.3.1.2.4		54.9	72.5	108.8	89.4	81.1	110.4	207.0	137.3	106.1	0.0	0.0	0.0	967.5
0G33126A94	Gaseous-Phase Circulation Study	7.8	10.5	32.4	40.7	7.1	25.5	57.0	-23.3	23.9	0.0	0.0	0.0	181.6
1.2.3.3.1.2.6		7.8	10.5	32.4	40.7	7.1	25.5	57.0	-23.3	23.9	0.0	0.0	0.0	181.6
0G33127A94	Gaseous-Phase Chemical Investigations	12.5	13.7	16.3	8.4	21.8	5.5	17.4	14.6	18.3	0.0	0.0	0.0	128.5
0G33127B94	Aqueous-Phase Chemical Investigations	9.8	7.3	16.0	15.9	11.4	27.9	12.2	20.3	16.3	0.0	0.0	0.0	137.1
1.2.3.3.1.2.7		22.3	21.0	32.3	24.3	33.2	33.4	29.6	34.9	34.6	0.0	0.0	0.0	265.6
0G33128A94	Development of Conceptual and Numerical	0.0	0.0	0.0	14.6	11.9	10.6	10.5	12.2	8.4	0.0	0.0	0.0	68.2
1.2.3.3.1.2.8		0.0	0.0	0.0	14.6	11.9	10.6	10.5	12.2	8.4	0.0	0.0	0.0	68.2
0G33129A94	Conceptualization of UZ Hydrogeologic Sy	0.0	0.0	0.0	14.3	15.5	29.4	21.3	17.4	23.4	0.0	0.0	0.0	121.3
1.2.3.3.1.2.9		0.0	0.0	0.0	14.3	15.5	29.4	21.3	17.4	23.4	0.0	0.0	0.0	121.3
0G33131B94	Site Potentiometric-Level Evaluation	30.9	31.1	56.4	46.5	33.9	38.4	72.9	42.6	109.9	0.0	0.0	0.0	462.6
0G33131C94	Anal Single/Mult-Well Hydraulic-Stress	5.2	2.8	6.3	1.5	2.1	4.7	-0.2	0.4	15.1	0.0	0.0	0.0	(
0G33131D94	Multiple-Well Interference Testing	11.7	26.2	38.1	38.1	20.5	1.1	11.7	-4.3	8.8	0.0	0.0	0.0	151.9
0G33131E94	Testing C-Hole Sites w/ Conserv Tracers	5.0	8.1	13.1	8.5	16.7	9.6	8.8	3.8	9.1	0.0	0.0	0.0	82.7
1.2.3.3.1.3.1		52.8	68.2	113.9	94.6	73.2	53.8	93.2	42.5	142.9	0.0	0.0	0.0	735.1
0G33132B94	Hydrochem Char of Water - Upper Part SZ	4.4	9.8	14.6	8.5	10.1	19.4	6.7	3.9	-4.9	0.0	0.0	0.0	72.5
1.2.3.3.1.3.2		4.4	9.8	14.6	8.5	10.1	19.4	6.7	3.9	-4.9	0.0	0.0	0.0	72.5
0G33133A94	Conceptualization of SZ Flow Models	3.8	3.9	15.3	4.8	6.1	8.3	4.1	2.9	3.1	0.0	0.0	0.0	52.3
0G33133B94	Development of Fracture-Network Model	5.3	5.8	-0.1	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6
1.2.3.3.1.3.3		9.1	9.7	15.2	4.4	6.1	8.3	4.1	2.9	3.1	0.0	0.0	0.0	62.9
*1.2.3.3		384.4	493.5	736.3	665.1	515.8	731.2	1016.8	689.7	890.4	0.0	0.0	0.0	6123.2
0G36212B94	Analysis of Stratigraphy - Sedimentology	11.3	12.3	21.9	13.4	15.2	16.5	13.0	26.6	16.2	0.0	0.0	0.0	146.4
1.2.3.6.2.1.2		11.3	12.3	21.9	13.4	15.2	16.5	13.0	26.6	16.2	0.0	0.0	0.0	146.4
0G36213A94	Analysis of Pack Rat Middens	0.0	0.0	36.3	1.4	4.5	-3.0	0.1	2.2	4.2	0.0	0.0	0.0	45.7

U.S. GEOLOGICAL SURVEY

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		OCT EST	NOV EST	DEC EST	JAN EST	FEB EST	MAR EST	APR EST	MAY EST	JUN EST	JUL EST	AUG EST	SEP EST	TOTAL
1.2.3.6.2.1.3		0.0	0.0	36.3	1.4	4.5	-3.0	0.1	2.2	4.2	0.0	0.0	0.0	45.7
0G36214B94		0.0	0.0	14.9	6.7	3.3	6.4	8.7	8.4	6.9	0.0	0.0	0.0	55.3
1.2.3.6.2.1.4		0.0	0.0	14.9	6.7	3.3	6.4	8.7	8.4	6.9	0.0	0.0	0.0	55.3
0G36221C94	Evaluation of Past Discharge Areas	0.0	0.0	19.0	16.4	32.2	23.4	20.4	32.8	19.2	0.0	0.0	0.0	163.4
0G36221D94	Analog Recharge Sites	7.6	4.4	6.8	3.6	7.9	6.2	7.2	0.0	0.0	0.0	0.0	0.0	43.7
0G36221E94	Analog Recharge Sites	0.0	0.0	7.5	-0.2	6.4	1.1	1.6	4.9	1.7	0.0	0.0	0.0	23.0
0G36221F94	Calcite and Opaline Silica Vein Deposits	15.6	26.6	35.6	28.7	29.0	24.3	27.0	56.8	4.5	0.0	0.0	0.0	248.1
1.2.3.6.2.2.1		23.2	31.0	68.9	48.5	75.5	55.0	56.2	94.5	25.4	0.0	0.0	0.0	478.2
*1.2.3.6		34.5	43.3	142.0	70.0	98.5	74.9	78.0	131.7	52.7	0.0	0.0	0.0	[illegible]
0G3721A94	Geochemical Assessment of YM in Relation	2.3	7.7	8.1	33.6	40.3	26.3	23.3	15.0	39.8	0.0	0.0	0.0	196.4
1.2.3.7.2.1		2.3	7.7	8.1	33.6	40.3	26.3	23.3	15.0	39.8	0.0	0.0	0.0	196.4
*1.2.3.7		2.3	7.7	8.1	33.6	40.3	26.3	23.3	15.0	39.8	0.0	0.0	0.0	196.4
**1.2.3		907.6	1114.9	1751.0	1690.5	1364.3	1609.9	1844.8	1555.3	1876.7	0.0	0.0	0.0	13715.0
0G52294B1	NRC Interaction Support	1.8	8.5	7.1	3.6	3.1	22.3	37.4	7.8	3.0	0.0	0.0	0.0	94.6
0G52294B2	Site Characterization Program	22.6	5.1	23.8	18.4	15.1	34.3	11.1	33.6	22.4	0.0	0.0	0.0	186.4
0G52294B3	Study Plan Coordination	1.0	19.7	-17.1	0.1	1.0	5.9	2.0	1.5	3.3	0.0	0.0	0.0	17.4
0G52294B4	Technical Status Report	2.7	0.0	0.0	0.0	0.0	9.7	1.6	-1.7	3.4	0.0	0.0	0.0	15.7
0G52294B5	Issue Resolution	0.0	0.0	0.0	0.0	1.7	0.0	-1.7	1.7	0.3	0.0	0.0	0.0	2.0
1.2.5.2.2		28.1	33.3	13.8	22.1	20.9	72.2	50.4	42.9	32.4	0.0	0.0	0.0	316.1
*1.2.5.2		28.1	33.3	13.8	22.1	20.9	72.2	50.4	42.9	32.4	0.0	0.0	0.0	316.1
0G53594B	Technical Data Base Input	24.2	32.2	28.8	26.1	24.3	31.0	30.1	37.0	31.2	0.0	0.0	0.0	264.9
0G53594H	Technical Data Base Control and Input	11.1	11.9	17.3	6.0	10.0	11.4	11.9	12.8	11.8	0.0	0.0	0.0	104.2
1.2.5.3.5		35.3	44.1	46.1	32.1	34.3	42.4	42.0	49.8	43.0	0.0	0.0	0.0	369.1
*1.2.5.3		35.3	44.1	46.1	32.1	34.3	42.4	42.0	49.8	43.0	0.0	0.0	0.0	369.1
0G54494H	Site Performance Assessment	10.1	11.7	25.5	10.7	11.7	8.3	8.8	13.9	15.8	0.0	0.0	0.0	[illegible]
1.2.5.4.4		10.1	11.7	25.5	10.7	11.7	8.3	8.8	13.9	15.8	0.0	0.0	0.0	116.5
*1.2.5.4		10.1	11.7	25.5	10.7	11.7	8.3	8.8	13.9	15.8	0.0	0.0	0.0	116.5
**1.2.5		73.5	89.1	85.4	64.9	66.9	122.9	101.2	106.6	91.2	0.0	0.0	0.0	801.7
0G91294B	Management and Integration (TPO)	21.5	21.2	55.3	20.1	30.7	43.1	101.6	29.7	45.1	0.0	0.0	0.0	368.3
1.2.9.1.2		21.5	21.2	55.3	20.1	30.7	43.1	101.6	29.7	45.1	0.0	0.0	0.0	368.3
*1.2.9.1		21.5	21.2	55.3	20.1	30.7	43.1	101.6	29.7	45.1	0.0	0.0	0.0	368.3
0G92294B	Project Control	52.9	-7.4	114.1	37.5	45.4	45.0	41.3	64.1	46.4	0.0	0.0	0.0	439.3
1.2.9.2.2		52.9	-7.4	114.1	37.5	45.4	45.0	41.3	64.1	46.4	0.0	0.0	0.0	439.3
*1.2.9.2		52.9	-7.4	114.1	37.5	45.4	45.0	41.3	64.1	46.4	0.0	0.0	0.0	439.3
**1.2.9		74.4	13.8	169.4	57.6	76.1	88.1	142.9	93.8	91.5	0.0	0.0	0.0	807.6
0GB194Q	QA-Coordination & Planning	23.4	25.3	30.9	18.9	24.6	29.0	18.9	32.1	27.4	0.0	0.0	0.0	230.5
1.2.11.1		23.4	25.3	30.9	18.9	24.6	29.0	18.9	32.1	27.4	0.0	0.0	0.0	230.5

U.S. GEOLOGICAL SURVEY

ESTIMATED COSTS FOR 10/1/93 - 06/30/94

		OCT EST	NOV EST	DEC EST	JAN EST	FEB EST	MAR EST	APR EST	MAY EST	JUN EST	JUL EST	AUG EST	SEP EST	TOTAL
*1.2.11.1		23.4	25.3	30.9	18.9	24.6	29.0	18.9	32.1	27.4	0.0	0.0	0.0	230.5
0GB294Q	QA-Program Development	33.4	31.3	46.5	29.9	52.8	46.4	39.3	37.8	33.1	0.0	0.0	0.0	350.5
1.2.11.2		33.4	31.3	46.5	29.9	52.8	46.4	39.3	37.8	33.1	0.0	0.0	0.0	350.5
*1.2.11.2		33.4	31.3	46.5	29.9	52.8	46.4	39.3	37.8	33.1	0.0	0.0	0.0	350.5
0GB3194Q	QA Verification-Audits	60.3	50.9	60.7	48.3	48.1	68.1	61.3	55.7	73.2	0.0	0.0	0.0	526.6
1.2.11.3.1		60.3	50.9	60.7	48.3	48.1	68.1	61.3	55.7	73.2	0.0	0.0	0.0	526.6
0GB3294Q	Quality Assurance Verification - Surveil	9.1	28.9	15.2	21.5	23.7	22.1	18.7	17.7	11.4	0.0	0.0	0.0	168.3
1.2.11.3.2		9.1	28.9	15.2	21.5	23.7	22.1	18.7	17.7	11.4	0.0	0.0	0.0	168.3
*1.2.11.3		69.4	79.8	75.9	69.8	71.8	90.2	80.0	73.4	84.6	0.0	0.0	0.0	6
0GB594B	QA-Quality Engineering	22.2	29.5	14.8	22.2	10.5	22.1	23.1	25.2	29.0	0.0	0.0	0.0	198.6
1.2.11.5		22.2	29.5	14.8	22.2	10.5	22.1	23.1	25.2	29.0	0.0	0.0	0.0	198.6
*1.2.11.5		22.2	29.5	14.8	22.2	10.5	22.1	23.1	25.2	29.0	0.0	0.0	0.0	198.6
**1.2.11		148.4	165.9	168.1	140.8	159.7	187.7	161.3	168.5	174.1	0.0	0.0	0.0	1474.5
0GC2294B	Local Records Center Operations	32.8	38.3	29.5	35.5	26.7	29.3	29.9	29.3	29.7	0.0	0.0	0.0	281.0
1.2.12.2.2		32.8	38.3	29.5	35.5	26.7	29.3	29.9	29.3	29.7	0.0	0.0	0.0	281.0
0GC2394B	Participant Records Management	3.6	8.7	6.6	7.2	8.1	7.3	7.1	6.7	41.8	0.0	0.0	0.0	97.1
1.2.12.2.3		3.6	8.7	6.6	7.2	8.1	7.3	7.1	6.7	41.8	0.0	0.0	0.0	97.1
*1.2.12.2		36.4	47.0	36.1	42.7	34.8	36.6	37.0	36.0	71.5	0.0	0.0	0.0	378.1
**1.2.12		36.4	47.0	36.1	42.7	34.8	36.6	37.0	36.0	71.5	0.0	0.0	0.0	378.1
0GD2594B	Occupational Safety and Health	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.4	6.6	0.0	0.0	0.0	20.0
1.2.13.2.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.4	6.6	0.0	0.0	0.0	20.0
*1.2.13.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.4	6.6	0.0	0.0	0.0	20.0
0GD4794H	Water Resources	32.9	27.8	32.9	29.7	32.4	32.7	27.8	32.1	65.5	0.0	0.0	0.0	313.8
1.2.13.4.7		32.9	27.8	32.9	29.7	32.4	32.7	27.8	32.1	65.5	0.0	0.0	0.0	313.8
*1.2.13.4		32.9	27.8	32.9	29.7	32.4	32.7	27.8	32.1	65.5	0.0	0.0	0.0	3
**1.2.13		32.9	27.8	32.9	29.7	32.4	32.7	27.8	45.5	72.1	0.0	0.0	0.0	333.8
0GF394B	Training	19.6	22.3	13.9	20.9	21.2	23.5	23.4	22.2	24.1	0.0	0.0	0.0	191.1
1.2.15.3		19.6	22.3	13.9	20.9	21.2	23.5	23.4	22.2	24.1	0.0	0.0	0.0	191.1
*1.2.15.3		19.6	22.3	13.9	20.9	21.2	23.5	23.4	22.2	24.1	0.0	0.0	0.0	191.1
**1.2.15		19.6	22.3	13.9	20.9	21.2	23.5	23.4	22.2	24.1	0.0	0.0	0.0	191.1
1.2 OPERATING		1293.4	1482.3	2266.0	2048.4	1762.4	2106.5	2345.6	2033.9	2412.4	0.0	0.0	0.0	17750.9
CAPITAL EQUIPMENT		0.0	0.0	0.0	31.7	22.6	0.0	0.5	32.2	143.4	0.0	0.0	0.0	230.4
GRAND TOTAL		1293.4	1482.3	2266.0	2080.1	1785.0	2106.5	2346.1	2066.1	2555.8	0.0	0.0	0.0	17981.3
FTEs														
FEDERAL		87.2	91.5	89.4	108.4	135.5	134.3	118.2	111.5	120.2	0.0	0.0	0.0	
CONTRACT		55.4	89.0	82.4	97.7	89.3	101.1	100.6	107.0	105.5	0.0	0.0	0.0	
TOTAL		142.6	180.5	171.8	206.1	224.8	235.4	218.8	218.5	225.7	0.0	0.0	0.0	

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Thru: June 30, 1994

PARTICIPANT: USGS **PEM: TYNAN** **WBS: 1.2.3.2.2.1.1**

WBS TITLE: Vertical and Lateral Distribution of Stratigraphic Units in the Site Area

P&S ACCOUNT: OG32211

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	SV%	SPI	CV	CV%	CPI	BAC	EAC	VAC	VAC%	IEAC	TCPI
880	880	993	0	0.0	100.0	-113.0	-12.8	88.6	1420	2502	-1082	-76.2	1603	35.8

Analysis

Cumulative Cost Variance:

Cause:

Much of the negative cost variance is due to not correctly identifying and planning necessary resources to complete the work. This has required some redirection of staff in order to meet planned milestones by the end of the fiscal year. Extensive travel and field excursions have been required for data collection and analysis. The remainder of the variance results from 1) reporting of costs for space & facilities earlier than planned and 2) labor charges incorrectly costed to this account.

Impact:

No impact. The account is expected to close out at or near the planned budget.

Corrective Action:

Make corrections in accounting system to reflect correct labor charges.

Cumulative Schedule Variance:

Not Applicable

Variance At Complete:

Cause:

The variance is due to the estimate to complete being modified to reflect additional scope/budget associated with running the seismic line. This EAC represents the estimated funds required to complete the work related to the seismic line planned for this fiscal year. The original budget was not

adequate to cover all scope addressed in PACS. If the decision is made not to award this contract this fiscal year, the EAC for this fiscal year will be modified, and the corresponding budget moved to fiscal year 1994. Further, a capital equipment summary account was added for procurement of a RAAX borehole image-processing system, which will provide a digital data set describing structural features and secondary features in support of the borehole geophysics program.

Impact:

None. Funds will be made available if a decision is made to proceed with award of the seismic line contract, or purchase of the RAAX system.

Corrective Action:

None required at this time.

P&S ACCOUNT MANAGER **DATE** **TPO** **DATE**

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Thru: June 30, 1994

PARTICIPANT: USGS **PEM: Sullivan** **WBS: 1.2.3.2.8.4.1**

WBS TITLE: Historical and Current Seismicity

P&S ACCOUNT: OG32841

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	SV%	SPI	CV	CV%	CPI	BAC	EAC	VAC	VAC%	IEAC	TCPI
1105	1166	1092	61	5.5	105.5	74	6.3	106.8	1997	2800	-803	-40.2	1870	48.7

Analysis

Cumulative Cost Variance:

Not applicable

Cumulative Schedule Variance

Not applicable

Variance At Complete:

Cause:
The ETC for the capital equipment account was modified to reflect the need for an additional $800K to complete the upgrade of the seismic network (3rd and 4th node)

Impact:
Completion of the upgrade may be delayed if funds are not made available to begin additional procurements.

Corrective Action:
None required at this time. Procurement will not proceed until funds are available.

P&S ACCOUNT MANAGER **DATE** **TPO** **DATE**

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Thru: June 30, 1994

PARTICIPANT: USGS **PEM: SULLIVAN** **WBS: 1.2.3.2.8.4.3**

WBS TITLE: Quaternary Faulting Within 100 km of Yucca Mountain

P&S ACCOUNT: OG32843

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	SV%	SPI	CV	CV%	CPI	BAC	EAC	VAC	VAC%	IEAC	TCPI
255	255	299	0	0.0	100.0	-44	-17.3	85.3	350	450	-100	-28.6	410.0	62.9

Analysis

Cumulative Cost Variance:

Not Applicable

Cumulative Schedule Variance:

Not Applicable

Variance At Complete:

Cause:

Additional funds of $100K are required because a new task is needed to study the Stuart Valley-Pahrump Valley Fault system. Work elements include an airphoto study to determine the number and length of fault segments, dating of appropriate rock and soil samples, and identification of possible trench sites for study in FY 1995. This is work that was planned for FY1994, but not funded in the baseline funding.

Impact:

There is no impact as work on this task will not begin until funds are made available.

Corrective Action:

None required at this time.

P&S ACCOUNT MANAGER **DATE** **TPO** **DATE**

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Thru: June 30, 1994

PARTICIPANT: USGS **PEM: SULLIVAN** **WBS: 1.2.3.2.8.4.4**

WBS TITLE: Quaternary Faulting in NE-Trending Fault Zones

P&S ACCOUNT: OG32844

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	SV%	SPI	CV	CV%	CPI	BAC	EAC	VAC	VAC%	IEAC	TCPI
126	71	103	-55	-43.7	56.3	-32	-45.1	68.9	150	201	-51	-34.0	218	80.6

Analysis

Cumulative Cost Variance:

Not Applicable

Cumulative Schedule Variance:

Not Applicable

Variance At Complete:

Cause:

Additional funds of $50K are required because a new task is needed for the study of the Rock Valley Fault system to date offset soil and alluvial deposits this fiscal year. Data obtained a decade ago by the Uranium-trend method must be re-evaluated by the Uranium series method before the final analysis of the Rock Valley faulting history can be completed. This is work that was planned for FY1994, but not funded in the baseline funding.

Impact:

There is no impact as work on this task will not begin until funds are made available.

Corrective Action:

None required at this time.

P&S ACCOUNT MANAGER **DATE** **TPO** **DATE**

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Thru: June 30, 1994

PARTICIPANT: USGS **PEM: SULLIVAN** **WBS: 1.2.3.2.8.4.6**

WBS TITLE: Quaternary Faulting Within the Site Area

P&S ACCOUNT: OG32846

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	SV%	SPI	CV	CV%	CPI	BAC	EAC	VAC	VAC%	IEAC	TCPI
324	324	350	0	0.0	100.0	-26	-8.0	92.6	430	530	-100	-23.3	464	58.9

Analysis

Cumulative Cost Variance:

Not Applicable

Cumulative Schedule Variance:

Not Applicable

Variance At Complete:

Cause:

Additional funds of $100K are required because a new task is needed to date offset soils and alluvium in paleoseismic trenches. Uranium-series and thermoluminescence methods will be used to complete paleoseismic histories on the Windy Wash, Solitario Canyon, Fatigue Wash, and Paintbrush Canyon faults. Deposits in stratigraphically important trenches also will be dated to facilitate correlation of units between trenches. This is work that was planned for FY1994, but not funded in the baseline funding.

Impact:

There is no impact as work on this task will not begin until funds are made available.

Corrective Action:

None required at this time.

P&S ACCOUNT MANAGER **DATE** **TPO** **DATE**

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Thru: June 30, 1994

PARTICIPANT: USGS **PEM: PATTERSON** **WBS: 1.2.3.3.1.2.3**

WBS TITLE: Percolation in the Unsaturated Zone - Surface-Based Study

P&S ACCOUNT: OG33123

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	SV%	SPI	CV	CV%	CPI	BAC	EAC	VAC	VAC%	IEAC	TCPI
2195	1567	2357	-628	-28.6	71.4	-790.0	-50.4	66.5	3164	2987	177	5.6	4758	253.5

Analysis

Cumulative Cost Variance:

Cause:

Most of the negative cost variance (indicating an overspent condition) is due to the behind-schedule condition. However, about $160K of the cost variance is due to 1) ahead-of-schedule acquisition and calibration of equipment needed for instrumentation of UZ boreholes, 2) redirection of some resources within the UZ-14 account to analyze samples of the perched water encountered in UZ-14, and 3) redirection of some resources to support DOE's initiative to acquire pre-ESF construction pneumatic and hydrologic data.

Impact:

Overall, this P&S account will not be overspent at the end of the FY 94, despite the redirection of resources as indicated above. However, unless the UZ-14 summary account is replanned to reflect current delays in drilling and testing, this summary account will be significantly underspent by the end of the year. However, because the resources allocated to this summary account are primarily salaries of permanent full-time staff, other closely related summary accounts in WBS 1233123 and 1233127 may be overspent because of the redirection of staff to tasks within those summary accounts.

Corrective Action:

A C/SCR could be prepared for the UZ-14 summary account as described in the "schedule variance" section. A portion of the current funding could be reprogrammed to other affected summary accounts in WBS 1233123 and WBS 1233127 to avoid the predicted overspent condition in these accounts.

Cumulative Schedule Variance:

Cause:

Several tasks involving testing, hydrologic instrumentation, and monitoring in recently drilled boreholes have been delayed by two to five months. These delays are all related to unexpected conditions encountered in the boreholes and are beyond the control of the USGS as described below.

1) Both air-permeability testing and instrumentation of NRG-6 have been delayed because a 50-foot section of casing is still lodged in this borehole.

2) Geophone instrumentation of UZ-16 and the vertical seismic profiling production survey have been delayed about 2 months due to the unavailability of a drilling/support crew. Time required for RSN to award a VSP data-acquisition contract has the potential to delay the production survey by another 3 months.

3) Tasks scheduled for UZ-14 are behind schedule by up to 6 months because of the delay in completion of drilling of USW UZ-14 because of the perched water encountered therein. UZ-14 tasks behind schedule include geophysical logging, gas sampling, preparation of data report, gas-phase testing, review of gas and water-vapor data, and air-permeability testing.

Impact:

1) The delay in instrumentation of NRG-6 will reduce the pre-TBM-excavation monitoring period for this borehole by about 5 months.

2) Delay of VSP survey of UZ-16 is acceptable because no near-term, high-priority YMP initiatives are impacted.

3) Although the overall YMP site-characterization schedule is impacted by delays at UZ-14, the delays are acceptable because no near-term, high-priority YMP initiatives are impacted.

Corrective Action:

1) USGS and DOE staff are working hard to maximize the scope and duration of pneumatic-pathways monitoring prior to excavation of the ESF north ramp by the TBM. To support this effort, USGS has agreed to change the priority order of borehole instrumentation so that two other boreholes can be instrumented in the near term in addition to NRG-6. Accordingly, NRG-7a will be instrumented instead of UZ-7, and SD-9 will be instrumented instead of SD-12. Individual task titles and work scopes have been revised in PACS to reflect these critical shifts in borehole-instrumentation priorities.

In addition, because of continuing access problems in hole NRG-6, air-permeability testing of NRG-7a will be performed first, and will begin during July.

2) A fourth drilling crew is scheduled to come on board in June and will allow commencement of UZ-16 VSP instrumentation in July. USGS will continue to work closely with RSN staff to minimize the delay in award of the VSP data-acquisition contract.

3) Most remaining work in UZ-14 has been put on hold until FY 95 in order to support DOE's initiative to obtain pre-ESF-north-ramp-construction data from NRG and SD boreholes. Because UZ-14 tasks comprise a dedicated summary account, some consideration should be given to a C/SCR to reschedule this account when enough is known about the sequence and duration of tasks still to be completed. Alternatively, the variance in this summary account could be allowed to grow through the end of FY 94 and then the UZ-14 summary account could be rebaselined or eliminated for FY 95.

Variance At Complete:

Not Applicable

P&S ACCOUNT MANAGER	DATE	TPO	DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Thru: June 30, 1994

PARTICIPANT: USGS **PEM: PATTERSON** **WBS: 1.2.3.3.1.2.4**

WBS TITLE: Percolation in the Unsaturated Zone - ESF Study

P&S ACCOUNT: OG33124

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	SV%	SPI	CV	CV%	CPI	BAC	EAC	VAC	VAC%	IEAC	TCPI
1302	1104	981	-198	-15.2	84.8	123.0	11.1	112.5	2328	1883	445	19.1	2069	135.7

Analysis

Cumulative Cost Variance:

Cause:

The positive cost variance (indicating an underspent condition) is due to 1) yet-to-be billed charges for hydrochemical analyses from flow experiments conducted for the prototype Intact Fracture and Percolation tests, 2) the delay to FY 95 of the award of a contract to the U.S. Bureau of Mines for installation of pressure cells for the Excavation Effects test, and 3) unspent funds budgeted for chemical analysis of samples as part of the Perched Water test.

Impact:

There is no programmatic impact from this cost variance because work is proceeding in accordance with the ESF tunnel-boring and alcove-construction schedule. The fiscal impact of the cost variance is discussed under "variance at completion."

Corrective Action:

Summary-account-level expenditures are being monitored carefully in order to identify cost underruns that may be available for reprogramming to priority needs elsewhere in the YMP.

Cumulative Schedule Variance:

Cause:

Schedule variance is due to 1) 2-month delay in the conduct of single-hole air-permeability tests in the first Radial Boreholes alcove because of a drill rig blocking access to the boreholes, unavailability of required power and compressed air, lack of access to the alcove because of TBM construction, and temporary disconnection of the alcove ventilation system; 2) 6-month delay in extraction of pore water from ESF drill

cores for the Hydrochemistry test because of delay in drilling of the radial boreholes and unavailability of equipment to squeeze cores; and 3) delay in procurement of capital equipment (high-pressure cell) for the prototype Intact Fracture test.

Impact:

ESF Radial Boreholes and Hydrochemistry tests are running behind schedule, but the delays are consistent with overall delays in the ESF schedule. The delays described are not controllable by the USGS.

Corrective Action:

Communicate problems to the ESF Testing Coordinator and request assistance with resolution.

Variance at Complete:

Cause:

Variance results from projection to the end of FY 94 of the individual cost variances described above, plus unspent ESF construction and support funds (REECo) budgeted for the Radial Boreholes and Hydrochemistry tests.

Impact:

This P&S account probably will be underspent by about $500 K at the end of FY 94. Major sources of the underrun include 1) delay to FY 95 of the award of a contract ($165 K) to the U.S. Bureau of Mines for installation of pressure cells for the Excavation Effects test, 2) unspent funds budgeted for equipment and chemical analysis of samples for the Perched Water and Hydrochemistry tests ($120 K), and 3) unspent ESF construction and support funds (REECo) budgeted for the Radial Boreholes and Hydrochemistry tests ($200 K).

Corrective Action:

USGS already has identified potential FY 94 underrun to the YMSCO. Some funds already have been reprogrammed to other high-priority needs per direction from YMSCO.

P&S ACCOUNT MANAGER DATE TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Thru: June 30, 1994

PARTICIPANT: USGS **PEM: PATTERSON** **WBS: 1.2.3.3.1.3.3**

WBS TITLE: Saturated Zone Hydro. Sys. Synthesis and Modeling

P&S ACCOUNT: OG33133

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	SV%	SPI	CV	CV%	CPI	BAC	EAC	VAC	VAC%	IEAC	TCPI
148	148	63	0	0.0	100.0	85	57.4	234.9	225	164	61	27.1	96	76.2

Analysis

Cumulative Cost Variance:

Cause:

The positive cost variance (indicating an underspent condition) is because the work for the Fracture-Network Modeling summary account is being accomplished by a former USGS employee on disability retirement who is continuing to work part time as a volunteer. This is why the summary account has accrued no costs since November 1993 and yet remains on schedule.

Impact:

Budgeted funds are not being spent at the rate originally anticipated.

Corrective Action:

See "variance at completion."

Cumulative Schedule Variance:

Not Applicable.

Variance At Complete:

Cause:

See "cumulative cost variance."

Impact:

The P&S account probably will underrun by about $120 K by the end of FY 94 because no additional staff will be brought on board until FY 95. There are no programmatic impacts because work is still on schedule.

Corrective Action:

Some of the unspent funds are being reserved to support analytical-element modeling analysis of boundary conditions for a site-scale saturated-zone flow model. The remaining unspent funds will be made available for reprogramming to other high-priority YMP work.

P&S ACCOUNT MANAGER	DATE	TPO	DATE