**Department of Energy**
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 30307
North Las Vegas, NV 89036-0307

QA: N/A

AUG 28 2001

OVERNIGHT MAIL

N. King Stablein
High Level Waste & Uranium Recovery
Division of Waste Management
Office of Nuclear Material Safety & Safeguards
U.S. Nuclear Regulatory Commission
Two White Flint North
Rockville, MD 20852

SUBMITTAL OF PARTICIPANTS' MONTHLY PROGRESS REPORT

As you have requested, the U.S. Nuclear Regulatory Commission is on distribution to receive a copy of the Yucca Mountain Site Characterization Project participants' monthly status report on a regular basis. Enclosed is the U.S. Geological Survey Progress Report for July 2001.

If you have any questions, please contact Bertha M. Terrell at (702) 794-1348.

Stephan Brocoum
Assistant Manager, Office of
Licensing and Regulatory Compliance

OL&RC:BMT-1670

Enclosure:
Ltr, 8/13/01, Craig to Trebules, w/encl

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YMP-5

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cc w/o encl:
J. R. Curtiss, Winston & Strawn, Washington, DC
M. A. Lugo, BSC, Las Vegas, NV

cc w/encl:
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B. J. Garrick, ACNW, Rockville, MD
W. D. Barnard, NWTRB, Arlington, VA
J. H. Kessler, EPRI, Palo Alto, CA
Steve Kraft, NEI, Washington, DC
R. R. Loux, State of Nevada, Carson City, NV
John Meder, State of Nevada, Carson City, NV
Alan Kalt, Churchill County, Fallon, NV
Irene Navis, Clark County, Las Vegas, NV
Harriet Ealey, Esmeralda County, Goldfield, NV
Leonard Fiorenzi, Eureka County, Eureka, NV
Andrew Remus, Inyo County, Independence, CA
Michael King, Inyo County, Edmonds, WA
Mickey Yarbro, Lander County, Battle Mountain, NV
Jason Pitts, Lincoln County, Caliente, NV
Judy Shankle, Mineral County, Hawthorne, NV
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Josie Larson, White Pine County, Ely, NV
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# United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 421
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

INFORMATION ONLY

August 13, 2001

Victor W. Trebules
Director, Office of Project Control
Yucca Mountain Site Characterization
Project Office
U. S. Department of Energy
P.O. Box 30307
Las Vegas, Nevada 89036-0307

SUBJECT: Yucca Mountain Project Branch - U.S. Geological Survey (YMPB-USGS) Progress Report, July, 2001

Attached is the USGS progress report in the required format for the month of July, 2001.

If you have any questions or need further information, please call Raye Ritchey Arnold at (303)236-5050, ext 296.

Sincerely,

Raye Ritchey Arnold
for Robert W. Craig
Technical Project Officer
Yucca Mountain Project Branch
U.S. Geological Survey

Enclosure:
cc: J. Bresee, DOE/OCRWM-HQ/Forrestal
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# U.S. GEOLOGICAL SURVEY
# EXECUTIVE SUMMARY

**July 2001**

## GEOLOGY

Geological work in support of the Nye County early warning drilling program continued, with three new hydrostratigraphic cross sections completed and in preparation for technical review. In related work, a data package titled "Interpretations of Deep Boreholes, Nye County Early Warning Drilling Program, Phase II" was compiled and submitted for technical review.

The Underground Mapping team continued a variety of efforts, including on-going mapping of Busted Butte mine-back faces as those were excavated. Digitization of field maps also continued. Field work and data collection continued on the supplemental surface-fracture study, and reduction of collected field data began. Development of the 3-D fracture network for Alcove #8/Niche #3 depiction continued. That depiction was submitted to the USGS TPO on August 1 in completion of Level 5 **milestone SPW151M5 [Memo to TPO: Submittal of 3-D Fracture Depiction]**. Work continued on finalization of technical review and check of field work for submittal of geotechnical data from Waste Handling Building (WHB) studies. Laboratory tests on WHB samples are complete. Analyses of those data continued, as did preparations for TDMS submittal.

## ENGINEERED BARRIER SYSTEM

Major, minor, and trace element analyses (performed on samples of ESF dust material) have been synthesized into appropriate tables for development of an interpretative report to the EBS team. Rare-earth element (REE) analyses of cross-drift tuff samples were acquired from the USGS Crustal Imaging and Characterization Team to serve as a basis of comparison with those dust samples. REE patterns differ significantly between the crystal-poor rhyolites and the crystal-rich trachytes; hence, the REE patterns for the dust can be used to estimate the relative abundance of those source rocks in the ESF dust load. Sources of the dust, with particular reference to elements that are enriched significantly over rock values, are being evaluated through the construction of spider diagrams in which the dust values are ratioed to the average values for the crystal-poor rhyolite.

## SATURATED-ZONE STUDIES

In work related to development of the hydrogeologic framework model (HFM) and the associated AMR, three new geologic cross sections were completed (and review began) for on-going additions to information for the Nye County early warning drilling program. Preparations were initiated for incorporation of those sections into the revised HFM.

Staff from the USGS continued modifications to the draft of the water-level AMR. Work on DIRS and QA-, software-, and data-related issues also continued. The AMR was submitted for initial check. Comments from one checker have been received, and revisions have been discussed informally. USGS approval for the potentiometric-surface map was received on July 10.

Several efforts related to the Alluvial Testing Complex (ATC) continued during July. Inadvertent omission of subroutines from earlier submission of hydraulic data-acquisition software was corrected, and arrangements are in place for installation and execution tests of the software at the ATC pad of well NC-EWDP-19D1, where data from pressure transmitters and flow meters can test the routines appropriately. ParoScientific transducers used during testing at borehole NC-EWDP-19D1 previously were sent for calibrations; those closing calibrations were received. [Westbay pressure transducers used to monitor wells NC-EWDP-15P, -19P, -4PA, -4PB, and Washburn 1-x are expected to be sent to Westbay in August for closing calibrations.]

Work continued on several aspects of the compilation of data spreadsheets for the ATC single-hole hydraulic testing. An attempt will be made to include the observation-well data (collected at wells NC-EWDP-15P, NC-EWDP-19P, NC-EWDP-4PA and -4PB, and Washburn1-x with the Westbay transducers) in the data package in addition to the main data collected at pumped well NC-EWDP-19D1 by the ParoScientific transducers. Although the ATC tracer-concentration data package is the responsibility of UNLV (Harry Reid Center), flow rates and pressures recorded during ATC single-well tracer testing (December 2000—April 2001) will be submitted by the USGS. Those tracer-test data are being combined for submittal with hydraulic testing data for ATC single-well testing from July through November 2000 originally intended for separate submittal.

Drilling of IM1 and IM2 wells for cross-hole hydraulic and tracer testing did commence in July under Nye County direction. Reverse-circulation pilot drilling was completed in July. Tests are not scheduled to begin until October 2001; instrumentation design and procurement are underway, with the USGS carrying responsibility for well IM2.

Work continued on compilation and completion of data packages in support of the SZ in-situ testing AMR. Technical checking, record supersession, and transmittals were accomplished on various packages. A data package titled "Transducer, Barometric Pressure, and Discharge Data Collected from 4/18/98 through 11/24/98 in Support of the On-going Hydraulic and Tracer Testing Being Conducted at the UE-25 C-Well Complex, Nevada" was submitted in completion of Level 5 **milestone SPH345CM5 [Closing Calibration Data to TDB/RPC]**. Support to development of that AMR also was provided by selection of technical editors to abstract text from existing USGS manuscripts to describe hydraulic and conservative-tracer testing at the C-holes complex; those abstraction efforts are underway, as are additions (updates) to software reports concerning routines used for analysis of hydraulic tests at the C-holes complex and at the ATC.

Transition of the water-level monitoring effort to UNLV continued during the period. Documentation of the closing calibration for the powered electric tape (PET-1) was completed. Work continued on transducer calibrations. A data package containing water-level data collected from January through July 2001 was submitted for technical review and checking. In preparation for a USGS open-file report on water levels measured in 2000—2001, hydrographs of manual measurements made from January 2000 to June 2001 were drafted, as were precision results from individual boreholes and mean annual borehole water-level hydrographs for the years 1985—2001. The report describing water-level data for calendar year 1999 is undergoing editorial review after revision in response to colleague-review comments.

Work on SZ regional modeling continued during the period, with efforts in data-base improvements, construction of flow models, and on-going refinements to modeling of flow. Two Level 5 milestones related to regional-modeling data bases were completed in July, including **milestone SPH672M5 [Update on Regional Data-base Integration and Analysis]** and **milestone SPH676M5 [Year-End Update on Regional Spatial Data Merge]**. Both milestones support the Death Valley regional flow system (DVRFS) model and describe enhancement of the ground-water information system (and retrieval and conversion of GWSI material to the DVRFS data base). Flexibility of the application was improved, as was access to California District data, and requirements for computer support were reduced. Lithologic and hydrostratigraphic data have been compiled for some 1,519 boreholes in the Death Valley region. The second milestone noted above described progress in integrating point-oriented data with spatial GIS data. Release of new software (ArcGIS, v. 8.1) allows external storage of GIS data in a relational data base. Preliminary work has begun on preparation of GIS coverages for distribution to Project investigators over the Internet. Review and updating of lithologic data for input into the NWIS data base continued.

Development of facies maps of specific hydrogeologic units continued, and additional work was performed on cross sections to be used in construction of the hydrogeologic framework model (HFM) for the transient flow model. Appropriate correlations were made between units depicted on older cross sections and the hydrogeologic units which will be used in the transient model. Processing of existing 3-D models (IT Corporation Oasis Valley model; USGS Silent Canyon Caldera Complex model; IT Corporation revised regional model, which included more detailed units in the Frenchman Flat area; and the YMP site model, GFM 3.1) continued for extraction of data sets which may contribute to the transient HFM or which may be compared to that model. Additional data sets (such as mapped outcrop, wells, and thrust faults and related unit extents which delineate extent of thrusted units) were processed for inclusion into the transient HFM. Work also continued on documentation of the steady-state HFM, with a related report nearing completion. The last four technical reviews for that calibrated steady-state flow-modeling report were received in July, and staff members are resolving technical comments.

Work continued on several draft manuscripts intended as USGS open-file reports, including *Facies analysis of Late Proterozoic through early Cambrian clastic rocks of*

*the Death Valley regional ground-water system and surrounding areas, Nevada and California*, by D. Sweetkind and D. White; *Facies analysis of Tertiary basin-filling rocks of the Death Valley regional ground-water system and surrounding areas, Nevada and California*, by D. Sweetkind, E. Taylor, and R. Drake, II; and *Hydrogeologic facies maps of six Tertiary volcanic units in the southwestern Nevada volcanic field, Nevada and California*, by R. Drake, II, and D. Sweetkind. In addition, an MF-series (miscellaneous field investigation) map at a scale of 1:350,000 has been submitted for processing and approval. That work is titled *Hydrostructural map of the Death Valley ground-water basin, Nevada and California* and is authored by C. Potter, D. Sweetkind, R. Dickerson, and M. Killgore.

## UNSATURATED-ZONE STUDIES

The USGS continued to monitor pressure, temperature, and water potential in surface-based boreholes at stations located in boreholes UE-25 UZ #4, UE-25 UZ #5, and USW NRG-7a. At the request of the NRC, the shutdown of UZ Borehole Monitoring has been postponed until the NRC has reviewed the data and reached agreement that the program should be halted. Scientists from the USGS are preparing an Appendix 7 presentation for the NRC to help with that decision. The presentation will cover water-potential, temperature, and pressure data from monitoring conducted from 1995 to the present in surface-based boreholes at Yucca Mountain. The USGS began compiling listings of equipment to be shut down and began preparing the Area 25 Hydrologic Research Facility calibration laboratory to complete necessary closing calibrations.

Isotopic and chemical investigations continued in support of the Drift-Scale Test in the ESF. Data from dissolved-ion and isotopic analyses have been compiled into a data package and checked. Preparation of that data package for submittal began. Staff from the USGS reviewed a LLNL technical procedure for water sampling and forwarded resulting comments. Observations made during the June water-sampling trip were compiled, with emphasis on suggestions for possible changes in procedure that could enhance the water-collection effort. A water-extraction experiment was conducted on core sample ECRB-SYBT-H#3 41.85-42.1 obtained from the site of the Cross-Drift Thermal Test. No water could be extracted by centrifugation, however, and the moisture content was estimated to be about 3.1%. Remaining core samples from the Cross-Drift Thermal Test area will be measured for moisture content in on-going analytical activity. Other on-going activity involved compilation of additional data packages, including assembling and checking of strontium data and compilation of uranium data collected on Drift-Scale Test water samples.

At a meeting convened on July 18 by the DOE, the status and path forward for the chlorine-36 ($^{36}Cl$) validation project was reviewed. Attending that meeting were representatives from the DOE, USGS, BSC, and LBNL. (LLNL and LANL attended by phone.) The agreed-upon path forward follows:

a) SMF will provide crushed (¼-inch size) samples from remaining validation core to USGS.

b) USGS will leach samples by passive technique for 1 hour (filtered w/ 0.45 filter paper, to be confirmed by LLNL). Note that this step requires revision of existing USGS procedure.
c) USGS will provide leachate to both LLNL and LANL. Under additional consideration is the possibility of USGS doing separate $^{36}Cl$ chemistry to generate a third AgCl split from each sample.
d) LLNL and LANL then perform $^{36}Cl$ chemistry.
e) LLNL and LANL measure Cl, Br, $SO_4$ (by ion chromatograph [IC]) and $^{36}Cl$ (by accelerator mass spectrometry [AMS]). (LLNL analyses will be performed at the Livermore Center for Accelerator Mass Spectrometry [CAMS]; LANL analyses will be conducted at Purdue).
f) LLNL & LANL exchange AgCl samples to repeat analyses at respective AMS facilities.
g) Evaluate results.

The USGS has identified 12 priority core samples to be crushed by the SMF. A technical procedure has been written and is under review. Equipment for the passive leaching is being acquired so that leaching can commence as soon as crushed samples are received from the SMF.

Other elements of isotopic/geochemical work also continued. Compilation of isotopic data for validation of surficial carbonate sources was completed. Preparation of the related data package continued. Several data packages in support of investigation of fluid inclusions in calcite and opal neared completion. A package presenting geochronology and fluid-inclusion data was nearly ready for checker review. A package containing fluid-inclusion temperature data is complete, has been through checker review, and is nearly ready for submittal to the TDB/RPC. Compilation of Sr isotope data and preparation of the surrogate-data package began during the reporting period.

## WATER-RESOURCES MONITORING

Ground-water levels were measured at 33 sites, and ground-water discharge was measured at one flowing well. Ground-water data collected during June were checked and filed. Compilation of historical ground-water levels, spring-flow discharges, precipitation, and water-use data from the study area continued. Data on ground-water levels and discharges collected from monitoring sites from April through June 2001 were reviewed. A letter report describing those third-quarter data was prepared and submitted to DOE and to the M&O on July 25 in completion of Level 5 **milestone SSW703M5 [Letter Update: 3rd Quarter FY2001 Water-Level Data]**. In unscheduled work, staff assisted in measurement of flow rates at water wells J-12, J-13 and Army 1 using an ultrasonic flow meter to compare flow rates measured with the in-line flow meters on the wells. The flow meters are used to measure total withdrawals from those wells.

# USGS Milestone Report

## October 1, 2000 - July 31, 2001

Sorted by Baseline Date

**Level: 3**

| Deliverable | | Due Date | Expected Date | Completed Date |
|---|---|---|---|---|
| **SSH015M3** | Occupational Training Needs Assessment | 6/29/01 | 6/12/01 | 6/12/01 |
| **SSH014M3** | Annual Training Plan | 6/29/01 | 6/12/01 | 6/12/01 |

# USGS Milestone Report

## October 1, 2000 - July 31, 2001

Sorted by Baseline Date

## Level: 5

| Deliverable | | Due Date | Expected Date | Completed Date |
|---|---|---|---|---|
| **SPH956CM5** | Fluid Inclusion Data to RPC/TDB | 3/30/01 | 9/14/01 | |
| **SPH689M5** | Progress HFM Update - Litho/Struct | 3/30/01 | 3/29/01 | 3/29/01 |
| **SPH856CM5** | Document Missing Closing Calibrations | 3/30/01 | 9/28/01 | |
| **SPH45BCM5** | Uranium/Strontium Anlys Data Pkg to RPC/TDB | 3/30/01 | 9/28/01 | |
| **SPH48CM5** | Dissolved Ion/Iso Anlys Data Pkg to RPC/TDB | 3/30/01 | 9/28/01 | |
| **SPH854CM5** | Cross Over Infiltration DP to RPC/TDB | 3/30/01 | 9/28/01 | |
| **SPH715M5** | Steady-State Model Report to Review | 3/30/01 | 4/26/01 | 4/26/01 |
| **SPI024CM5** | Strat Workbook: 3rd Qtr Data Submittal | 3/30/01 | 9/28/01 | |
| **SPH747CM5** | Document Missing Closing Calibrations | 3/30/01 | 9/28/01 | |
| **SPH872CM5** | Alcove 1 DP to RPC/TDB | 3/30/01 | 9/28/01 | |
| **SPH398CM5** | Report: WL Data for Calendar Year 1999 | 3/30/01 | 8/31/01 | |
| **SPH291CM5** | Diss Ion & Iso Anlys of Perched Wtr to RPC/TDB | 3/30/01 | 3/30/01 | 3/30/01 |
| **SPH394CM5** | Water-Level Data 2nd Qtr FY00 DP to RPC/TDB | 3/30/01 | 3/9/01 | 3/9/01 |
| **SPH396CM5** | Water-Level Data 3rd Qtr FY00 DP to RPC/TDB | 3/30/01 | 3/9/01 | 3/9/01 |
| **SPH459CM5** | Document Missing Closing Calibrations | 3/30/01 | 9/28/01 | |
| **SPI022CM5** | Strat Workbook: 2nd Qtr Data Submittal | 3/30/01 | 9/28/01 | |
| **SPM311M5** | ATC Hydraulic Testing Data to TDB/RPC | 3/30/01 | 9/28/01 | |
| **SPI026CM5** | Strat Workbook: 4th Qtr Data Submittal | 3/30/01 | 9/28/01 | |
| **SPH477CM5** | Descript & DP: Dissolved Ion & Isotopic Anal | 3/30/01 | 3/30/01 | 3/30/01 |

# USGS Milestone Report

## October 1, 2000 - July 31, 2001

Sorted by Baseline Date

**Level: 5**

| Deliverable | | Due Date | Expected Date | Completed Date |
|---|---|---|---|---|
| **SPH737CM5** | Moisture Monitoring DP to RPC/TDB | 3/30/01 | 9/28/01 | |
| **SPH457CM5** | EBS DP to TDB/RPC | 3/30/01 | 9/28/01 | |
| **SPH490CM5** | Alluvium Tstg Complex Results DP to RPC/TDB | 3/30/01 | 9/28/01 | |
| **SPH876CM5** | Document Missing Closing Calibrations | 3/30/01 | 9/28/01 | |
| **SPH3491CM5** | RPC/TDB: SD-6 Pumping/Monitoring Data Pkg | 4/2/01 | 3/21/01 | 3/21/01 |
| **SPM403M5** | Status of Water-Level AMR, Rev 1 | 4/11/01 | 4/2/01 | 4/2/01 |
| **SPM341M5** | Phase 2 Borehole Lithologies to TDB/RPC | 4/16/01 | 8/6/01 | |
| **SSH617CM5** | Document Missing Closing Calibrations | 4/26/01 | 9/28/01 | |
| **SSH615CM5** | Tipping Bucket Monitoring Data to RPC/TDB | 4/26/01 | 9/28/01 | |
| **SPM509M5** | Status of HFM Update | 4/27/01 | 4/19/01 | 4/19/01 |
| **SSW702M5** | Letter Update: 2nd Qtr FY01 | 4/30/01 | 4/30/01 | 4/30/01 |
| **SPH345CM5** | Closing Calibration Data to TDB/RPC | 4/30/01 | 7/10/01 | 7/10/01 |
| **SPH965CM5** | Submit Borehole Logs | 4/30/01 | 9/28/01 | |
| **SPH970CM5** | Submit Ring Density TDIF | 5/30/01 | 9/4/01 | |
| **SPW393BM5** | Continuous WL Data Aug 00-Mar 01 to TDB/RPC | 5/31/01 | 8/31/01 | |
| **SPH703M5** | Transient Target Heads Progress Report | 5/31/01 | 5/23/01 | 5/23/01 |
| **SPW393AM5** | Manual WL Data Jul-Dec 00 to TDB/RPC | 5/31/01 | 8/31/01 | |
| **SPH717M5** | Steady-State Mdl Rpt for USGS Director's Appr | 6/29/01 | 9/28/01 | |
| **SPH684M5** | Progress HFM Update - Transient Model | 6/29/01 | 6/28/01 | 6/28/01 |

# USGS Milestone Report

## October 1, 2000 - July 31, 2001

Sorted by Baseline Date

## Level: 5

| Deliverable | | Due Date | Expected Date | Completed Date |
|---|---|---|---|---|
| **SPW396M5** | Status of Transition Memo to TPO | 6/29/01 | 6/27/01 | 6/27/01 |
| **SPH672M5** | Year End Update Reg DB Integ and Anlys | 7/13/01 | 7/2/01 | 7/2/01 |
| **SPH676M5** | Year End Update on Reg Spatial Data Merge | 7/13/01 | 7/2/01 | 7/2/01 |
| **SPZ524M5** | C-, O-, Sr- Isotopic Data to TDB/RPC | 7/16/01 | 8/14/01 | |
| **SPH493CM5** | Busted Butte Hydro Data to RPC/TDB | 7/25/01 | 8/31/01 | |
| **SPH494CM5** | Document Missing Closing Calibrations | 7/25/01 | 4/18/01 | 4/18/01 |
| **SPM510M5** | HFM Revision to F&T Model | 7/30/01 | 7/30/01 | 7/30/01 |
| **SPM505M5** | Status of Geologic X-Sections Memorandum | 7/31/01 | 8/3/01 | |
| **SSW703M5** | Letter Update: 3rd Qtr FY01 | 7/31/01 | 7/25/01 | 7/25/01 |

**YMP PLANNING AND CONTROL SYSTEM (PACS)**

MONTHLY COST/FTE REPORT

Participant U.S. Geological Survey
Date Prepared: 8/9/01 11:14 AM

Fiscal Month/Year July 31, 2001
Page 1 of 1

| WBS ELEMENT | CURRENT MONTH END ACTUAL COSTS | CURRENT MONTH END PARTICIPANT HOURS | CURRENT MONTH END SUBCONTRACT HOURS | CURRENT MONTH END PURCHASE COMMITMENTS | CURRENT MONTH END SUBCONTRACT COMMITMENTS | CURRENT MONTH END ACCRUED COSTS | FISCAL YEAR APPROVED BUDGET | FISCAL YEAR APPROVED FUNDS | FISCAL YEAR CUMMULATIVE COSTS |
|---|---|---|---|---|---|---|---|---|---|
| 1.2.21.1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 |
| 1.2.21.2.1 | 2 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 13 |
| 1.2.21.2.2 | 19 | 256 | 0 | 0 | 0 | 0 | 74 | 0 | 21 |
| 1.2.21.3.2 | 0 | 0 | 0 | 0 | 0 | 0 | 155 | 0 | 0 |
| 1.2.21.3.D | 11 | 176 | 0 | 0 | 0 | 0 | 77 | 0 | 11 |
| 1.2.21.3.S | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 0 | 0 |
| 1.2.21.3.U | 0 | 0 | 0 | 0 | 157 | 0 | 478 | 0 | 3 |
| 1.2.21.5.2 | 72 | -10 | 0 | 0 | 0 | 0 | 598 | 0 | 487 |
| 1.2.21.5.3 | 150 | 1270 | 2131 | 0 | 183 | 0 | 1480 | 0 | 1733 |
| 1.2.21.5.4 | 167 | 2396 | 382 | 0 | 31 | 0 | 1600 | 0 | 1687 |
| 1.2.21.5.T | 44 | 317 | 480 | 0 | 46 | 0 | 634 | 0 | 422 |
| 1.2.21.6.1 | 211 | 1253 | 727 | 0 | 91 | 0 | 2068 | 0 | 1386 |
| 1.2.22.4.6 | 55 | 514 | 275 | 0 | 52 | 0 | 533 | 0 | 464 |
| 1.2.22.4.E | 21 | 111 | 72 | 0 | 29 | 0 | 212 | 0 | 89 |
| 1.2.22.4.S | 350 | 2100 | 98 | 0 | 136 | 0 | 2261 | 0 | 1395 |
| 1.2.22.4.U | 214 | 1311 | 1024 | 0 | 0 | 0 | 2454 | 0 | 1742 |
| 1.2.22.6.T | 0 | 0 | 0 | 0 | 0 | 0 | 350 | 0 | 333 |
| 1.2.22.8.0 | 6 | 119 | 0 | 0 | 0 | 0 | 50 | 0 | 34 |
| | 1322 | 9813 | 5189 | 0 | 725 | 0 | 13164 | 0 | 9820 |

U.S. GEOLOGICAL SURVEY

ESTIMATED COSTS FOR October 1, 1999 - July 31, 2001

8/7/01 8:40:06 AM

| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4889-10716 Support to Chief Science Organization | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **81912110U1** Support to Chief Science Organizatio | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **2018** Basis for Recommendation | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 1.2.21.1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 1.2.21.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 4889-21211 Science Support to Vol. 1 SR (LOE) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.2 | 0.0 | 1.8 | 0.0 | 0.0 | 12.96 |
| **81912121U1** Science Support to Volume 1 - SR | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.2 | 0.0 | 1.8 | 0.0 | 0.0 | 12.96 |
| **2016** Site Recommendation Rprt Vol. 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.2 | 0.0 | 1.8 | 0.0 | 0.0 | 12.96 |
| 1.2.21.2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.2 | 0.0 | 1.8 | 0.0 | 0.0 | 12.96 |
| 4889-21225 Qualitative Natural Analog Study UZ Move | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 19.1 | 0.0 | 0.0 | 20.97 |
| **81912122U1** Geology and Natural Analogs Liaison | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 19.1 | 0.0 | 0.0 | 20.97 |
| **GS6105** USGS YMSD-Science Support to SR | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 19.1 | 0.0 | 0.0 | 20.97 |
| 1.2.21.2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 19.1 | 0.0 | 0.0 | 20.97 |
| 1.2.21.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.2 | 1.9 | 20.9 | 0.0 | 0.0 | 33.93 |
| 4889-21318 International TSPA-SR Peer Review | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 4889-21319 Science Support to TSPA-SR (LOE) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 4889-21320 TSPA Checker Support | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **81912132U2** Science Support to TSPA - SR | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **GS2397** USGS TSPA for SR | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 1.2.21.3.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 4889-22209 Support to Disruptive Events | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 10.61 |
| **8191213DU1** Disruptive Events Process Model Rep | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 10.61 |
| **GS9093** USGS - Tectonic Hazards PMR - SR | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 10.61 |
| 1.2.21.3.D | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 10.61 |
| 4889-21350 Saturated Zone PMR Finalize Field Data | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 4889-21351 Saturated Zone PMR Comment Resolutio | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 4889-21355 Saturated Zone PMR rev. 1 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.17 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **8191213SU7** Science Support to SZ PMR for SR | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.17 |
| **2031** SZ Flow and Transport PMR-SR | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.17 |
| 1.2.21.3.S | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.17 |
| 4889-21360 Unsaturated Zone PMR Finalize Field Dat | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.08 |
| 4889-21361 Unsaturated Zone PMR Comment Resolut | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 4889-21365 Unsaturated Zone PMR rev. 1 | 0.0 | 2.1 | 1.0 | 0.8 | -3.8 | 3.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.31 |
| **8191213UU7** Science Support to UZ PMR for SR | 0.0 | 2.1 | 1.0 | 0.8 | -3.8 | 3.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.39 |
| 4889-21372 Infiltration Footprint | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **8191213UU8** UZ F&T Analysis and Documentation | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 4889-21399 DEFERRED - Alcove Moisture Monitoring | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **8191213UUM** DEFERRED - Alcove Moisture Monito | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **2027** UZ Flow and Transport PMR-SR | 0.0 | 2.1 | 1.0 | 0.8 | -3.8 | 3.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.39 |
| 1.2.21.3.U | 0.0 | 2.1 | 1.0 | 0.8 | -3.8 | 3.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.39 |
| 1.2.21.3 | 0.0 | 2.2 | 1.0 | 0.8 | -3.8 | 3.3 | 0.0 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 14.17 |
| 4732-16300 Water Resources | 35.8 | 35.8 | 35.8 | 2.8 | 45.1 | 26.7 | 18.5 | 46.0 | 32.7 | 63.3 | 0.0 | 0.0 | 342.57 |
| **81912152U5** Water Resources | 35.8 | 35.8 | 35.8 | 2.8 | 45.1 | 26.7 | 18.5 | 46.0 | 32.7 | 63.3 | 0.0 | 0.0 | 342.57 |
| 4889-10715 Federal Occuational Safety & Health | 8.4 | 10.8 | 7.6 | 8.5 | 7.8 | 10.6 | 6.9 | 9.7 | 7.6 | 8.4 | 0.0 | 0.0 | 86.36 |
| **81912152U6** Federal Occupational Safety and Hea | 8.4 | 10.8 | 7.6 | 8.5 | 7.8 | 10.6 | 6.9 | 9.7 | 7.6 | 8.4 | 0.0 | 0.0 | 86.36 |
| 4889-84099 DEFERRED - Precipitation Gage Monitori | 4.3 | 16.3 | 15.1 | 8.3 | 9.8 | 3.0 | 1.3 | 0.8 | -0.4 | 0.0 | 0.0 | 0.0 | 58.51 |
| **81912152UM** DEFERRED - Precipitation Gage Mon | 4.3 | 16.3 | 15.1 | 8.3 | 9.8 | 3.0 | 1.3 | 0.8 | -0.4 | 0.0 | 0.0 | 0.0 | 58.51 |
| **GS9121** USGS ES & H Core Program - SR | 48.5 | 62.9 | 58.5 | 19.7 | 62.7 | 40.3 | 26.7 | 56.5 | 40.0 | 71.7 | 0.0 | 0.0 | 487.44 |
| 1.2.21.5.2 | 48.5 | 62.9 | 58.5 | 19.7 | 62.7 | 40.3 | 26.7 | 56.5 | 40.0 | 71.7 | 0.0 | 0.0 | 487.44 |
| 4889-10535 Technical Data Management | 36.3 | 35.5 | 48.3 | 36.6 | 35.7 | 38.3 | 36.0 | 68.1 | 7.8 | 38.4 | 0.0 | 0.0 | 381.06 |
| **81912153U3** Technical Data Management | 36.3 | 35.5 | 48.3 | 36.6 | 35.7 | 38.3 | 36.0 | 68.1 | 7.8 | 38.4 | 0.0 | 0.0 | 381.06 |
| 4889-21111 Data Q/V & Software V for SR Products | 149.1 | 163.0 | 122.0 | 166.7 | 168.0 | 143.0 | 112.3 | 96.8 | 33.8 | 102.7 | 0.0 | 0.0 | 1,257.29 |
| **81912153U5** Data Q/V & Software V for SR Produc | 149.1 | 163.0 | 122.0 | 166.7 | 168.0 | 143.0 | 112.3 | 96.8 | 33.8 | 102.7 | 0.0 | 0.0 | 1,257.29 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GS2470** USGS Tech. Data Mngmnt - SR | 185.5 | 198.4 | 170.3 | 203.3 | 203.7 | 181.3 | 148.3 | 164.9 | 41.6 | 141.1 | 0.0 | 0.0 | 1,638.35 |
| 4889-10714 Records | 6.0 | 5.9 | 9.8 | 10.9 | 11.5 | 11.2 | 12.4 | 23.9 | -6.6 | 9.3 | 0.0 | 0.0 | 94.23 |
| **81912153U4** Records | 6.0 | 5.9 | 9.8 | 10.9 | 11.5 | 11.2 | 12.4 | 23.9 | -6.6 | 9.3 | 0.0 | 0.0 | 94.23 |
| **GS9197** USGS Dcmnt Cntrl, Rcrds & Mngmnt | 6.0 | 5.9 | 9.8 | 10.9 | 11.5 | 11.2 | 12.4 | 23.9 | -6.6 | 9.3 | 0.0 | 0.0 | 94.23 |
| 1.2.21.5.3 | 191.4 | 204.3 | 180.1 | 214.1 | 215.2 | 192.5 | 160.7 | 188.8 | 35.0 | 150.5 | 0.0 | 0.0 | 1,732.58 |
| 4889-10710 TPO | 99.6 | 106.3 | 90.9 | 104.9 | 84.7 | 154.5 | 61.1 | 132.4 | 87.0 | 89.3 | 0.0 | 0.0 | 1,010.66 |
| **81912154U4** USGS TPO | 99.6 | 106.3 | 90.9 | 104.9 | 84.7 | 154.5 | 61.1 | 132.4 | 87.0 | 89.3 | 0.0 | 0.0 | 1,010.66 |
| 4889-10713 Project Control | 55.7 | 21.4 | 28.1 | 30.2 | 27.9 | 33.1 | 26.8 | 44.1 | 17.5 | 40.5 | 0.0 | 0.0 | 325.08 |
| **81912154U5** Project Control | 55.7 | 21.4 | 28.1 | 30.2 | 27.9 | 33.1 | 26.8 | 44.1 | 17.5 | 40.5 | 0.0 | 0.0 | 325.08 |
| 4889-11201 Regulatory Product Integrity | 35.8 | 34.0 | 33.1 | 34.8 | 33.8 | 39.6 | 31.8 | 46.4 | 25.2 | 37.0 | 0.0 | 0.0 | 351.36 |
| **81912154U6** Regulatory Product Integrity | 35.8 | 34.0 | 33.1 | 34.8 | 33.8 | 39.6 | 31.8 | 46.4 | 25.2 | 37.0 | 0.0 | 0.0 | 351.36 |
| **GS9135** USGS Project Planning & Control | 191.0 | 161.7 | 152.0 | 169.9 | 146.4 | 227.2 | 119.7 | 222.8 | 129.7 | 166.7 | 0.0 | 0.0 | 1,687.09 |
| 1.2.21.5.4 | 191.0 | 161.7 | 152.0 | 169.9 | 146.4 | 227.2 | 119.7 | 222.8 | 129.7 | 166.7 | 0.0 | 0.0 | 1,687.09 |
| 4889-21599 DEFERRED - Water Level Monitoring Clo | 19.3 | 13.9 | 17.2 | 16.5 | 37.0 | 21.2 | 19.9 | 37.6 | 6.7 | 22.1 | 0.0 | 0.0 | 211.39 |
| 4889-23099 DEFERRED - Surface Base Boreholes Cl | 18.4 | 17.7 | 21.2 | 21.2 | 23.4 | 25.0 | 12.2 | 35.5 | 14.0 | 22.2 | 0.0 | 0.0 | 210.85 |
| **8191215TUM** DEFERRED - Testing and Analysis C | 37.7 | 31.7 | 38.4 | 37.7 | 60.4 | 46.2 | 32.1 | 73.1 | 20.7 | 44.2 | 0.0 | 0.0 | 422.24 |
| **8621** USGS Tst Coord/Sup for Site Activitie | 37.7 | 31.7 | 38.4 | 37.7 | 60.4 | 46.2 | 32.1 | 73.1 | 20.7 | 44.2 | 0.0 | 0.0 | 422.24 |
| 1.2.21.5.T | 37.7 | 31.7 | 38.4 | 37.7 | 60.4 | 46.2 | 32.1 | 73.1 | 20.7 | 44.2 | 0.0 | 0.0 | 422.24 |
| 1.2.21.5 | 468.7 | 460.6 | 429.0 | 441.4 | 484.6 | 506.1 | 339.2 | 541.3 | 225.4 | 433.1 | 0.0 | 0.0 | 4,329.34 |
| 4889-10401 Support & Personnel Services | 19.3 | 36.3 | 22.0 | 30.3 | 22.6 | 29.2 | 22.4 | 26.3 | 27.3 | 27.3 | 0.0 | 0.0 | 262.97 |
| 4889-10402 Procurement & Property Mgt. | 14.6 | 15.1 | 13.7 | 13.7 | 13.6 | 11.6 | 8.1 | 19.7 | 8.6 | 16.7 | 0.0 | 0.0 | 135.45 |
| 4889-10403 Facilities Management - Space | 74.7 | -44.7 | 149.7 | -11.4 | -40.6 | 26.0 | 126.8 | 0.0 | 0.0 | 120.5 | 0.0 | 0.0 | 400.91 |
| 4889-10404 Facilities Management - Computers/Phon | 0.0 | 2.4 | 0.9 | 7.9 | 0.4 | 2.7 | 0.4 | 22.5 | 5.9 | 5.3 | 0.0 | 0.0 | 48.50 |
| 4889-10405 Facilities Management - Other | 20.7 | 31.1 | -19.1 | 0.0 | 0.8 | 0.7 | 1.5 | 34.6 | -2.5 | 0.0 | 0.0 | 0.0 | 67.81 |
| 4889-10406 Computer Support | 20.7 | 20.2 | 16.7 | 14.2 | 17.2 | 15.6 | 13.6 | 24.0 | 20.1 | 24.9 | 0.0 | 0.0 | 187.23 |
| **81912161U3** Support and Personnel Services | 150.0 | 60.4 | 184.0 | 54.8 | 14.0 | 85.8 | 172.8 | 127.1 | 59.4 | 194.7 | 0.0 | 0.0 | 1,102.87 |
| 4889-10409 DEFERRED - Space and Facilities | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |

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| **81912161UM** DEFERRED - Space and Facilities | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **GS533** USGS Administrative Support - SR | 150.0 | 60.4 | 184.0 | 54.8 | 14.0 | 85.8 | 172.8 | 127.1 | 59.4 | 194.7 | 0.0 | 0.0 | 1,102.87 |
| 4889-10711 Training Support | 7.5 | 60.6 | 25.7 | 23.6 | 22.4 | 20.7 | 18.6 | 80.3 | 7.6 | 16.1 | 0.0 | 0.0 | 283.08 |
| **81912161U4** Training Support | 7.5 | 60.6 | 25.7 | 23.6 | 22.4 | 20.7 | 18.6 | 80.3 | 7.6 | 16.1 | 0.0 | 0.0 | 283.08 |
| **GS9111** USGS Training Program - SR | 7.5 | 60.6 | 25.7 | 23.6 | 22.4 | 20.7 | 18.6 | 80.3 | 7.6 | 16.1 | 0.0 | 0.0 | 283.08 |
| 1.2.21.6.1 | 157.5 | 121.0 | 209.6 | 78.4 | 36.5 | 106.4 | 191.4 | 207.5 | 66.9 | 210.8 | 0.0 | 0.0 | 1,385.95 |
| 1.2.21.6 | 157.5 | 121.0 | 209.6 | 78.4 | 36.5 | 106.4 | 191.4 | 207.5 | 66.9 | 210.8 | 0.0 | 0.0 | 1,385.95 |
| **1.2.21** | **626.2** | **583.8** | **639.6** | **520.6** | **517.3** | **615.9** | **530.5** | **759.9** | **294.2** | **675.3** | **0.0** | **0.0** | **5,763.39** |
| 4889-21501 Lithostratigraphic Support to Nye Co. | 18.8 | 11.1 | 13.5 | 18.5 | 15.7 | 9.2 | 7.0 | 8.5 | 7.1 | 7.5 | 0.0 | 0.0 | 117.00 |
| 4889-21511 Hydrostratigraphic Cross-Sections of Nye | 0.0 | 0.0 | 17.6 | 6.3 | 12.0 | 24.5 | 15.5 | 28.6 | 13.5 | 36.8 | 0.0 | 0.0 | 154.86 |
| **81912246U1** Lithostratigraphic Support to Nye Cou | 18.8 | 11.1 | 31.1 | 24.8 | 27.7 | 33.7 | 22.5 | 37.1 | 20.7 | 44.3 | 0.0 | 0.0 | 271.85 |
| 4889-21502 Isotope/Hydrochemical Support to Nye Co | 23.4 | 17.0 | 20.8 | 17.7 | 37.5 | 29.2 | 12.7 | 16.7 | 6.3 | 11.2 | 0.0 | 0.0 | 192.37 |
| **81912246U2** Isotope/Hydrochemical Support to Ny | 23.4 | 17.0 | 20.8 | 17.7 | 37.5 | 29.2 | 12.7 | 16.7 | 6.3 | 11.2 | 0.0 | 0.0 | 192.37 |
| **RMX25LA** Nye County Drilling | 42.2 | 28.2 | 51.8 | 42.5 | 65.2 | 62.9 | 35.2 | 53.8 | 26.9 | 55.5 | 0.0 | 0.0 | 464.22 |
| 1.2.22.4.6 | 42.2 | 28.2 | 51.8 | 42.5 | 65.2 | 62.9 | 35.2 | 53.8 | 26.9 | 55.5 | 0.0 | 0.0 | 464.22 |
| 4889-21322 Effects of Water-Rock Interaction on EBS | 0.0 | 3.0 | 5.3 | 0.0 | 17.3 | 0.6 | 19.3 | -0.3 | 12.0 | 19.8 | 0.0 | 0.0 | 77.00 |
| **8191224EU2** Effects of Water-Rock Interaction on | 0.0 | 3.0 | 5.3 | 0.0 | 17.3 | 0.6 | 19.3 | -0.3 | 12.0 | 19.8 | 0.0 | 0.0 | 77.00 |
| 4889-21321 Laboratory Support for EBS Thermal Testi | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 | 1.4 | 0.0 | 0.0 | 12.33 |
| **8191224EU3** Thermal Conductivity (EBS) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 | 1.4 | 0.0 | 0.0 | 12.33 |
| **GS532** USGS-EBS Dgrdtn Flow & Trnsprt P | 0.0 | 3.0 | 5.3 | 0.0 | 17.3 | 0.6 | 19.3 | -0.3 | 22.9 | 21.1 | 0.0 | 0.0 | 89.32 |
| 1.2.22.4.E | 0.0 | 3.0 | 5.3 | 0.0 | 17.3 | 0.6 | 19.3 | -0.3 | 22.9 | 21.1 | 0.0 | 0.0 | 89.32 |
| 4889-21357 Hydrogeologic Framework AMR | 0.0 | 0.4 | 0.0 | 0.0 | 11.5 | 12.0 | 18.3 | -1.3 | 3.2 | 2.8 | 0.0 | 0.0 | 46.86 |
| 4889-21358 Water Level AMR | 7.9 | 3.8 | 4.1 | 3.6 | 4.4 | 6.3 | 2.9 | 5.4 | 3.9 | 5.0 | 0.0 | 0.0 | 47.21 |
| 4889-22451 SZ AMRs/PMRs | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **8191224SU1** Science Support to SZ AMRs/PMR fo | 7.9 | 4.2 | 4.1 | 3.6 | 15.9 | 18.4 | 21.2 | 4.0 | 7.1 | 7.7 | 0.0 | 0.0 | 94.07 |
| 4889-12013 Alluvial Testing Complex | 60.9 | 33.1 | 45.5 | 27.1 | 24.5 | 43.6 | 25.7 | 36.7 | 26.5 | 22.4 | 0.0 | 0.0 | 345.94 |
| 4889-12014 Support to In-Situ AMR, Rev.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.9 | 0.0 | 0.0 | 8.91 |

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| **8191224SU3** SZ Investigations | 60.9 | 33.1 | 45.5 | 27.1 | 24.5 | 43.6 | 25.7 | 36.7 | 26.5 | 31.3 | 0.0 | 0.0 | 354.86 |
| 4889-12015 Monitor Isotope/Hydrochemical Conditions | 1.2 | 5.9 | 2.6 | 6.3 | 5.6 | 1.9 | 4.3 | 5.3 | 2.9 | 3.8 | 0.0 | 0.0 | 39.87 |
| 4889-12017 Isotopic Dating of Groundwater | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 2.5 | 3.3 | 0.0 | 0.0 | 6.69 |
| **8191224SU4** SZ Isotope Hydrology | 1.2 | 5.9 | 2.6 | 6.3 | 5.6 | 1.9 | 4.3 | 6.2 | 5.4 | 7.1 | 0.0 | 0.0 | 46.56 |
| 4889-11012 Regional Modeling Data Base | 5.5 | 6.4 | 7.3 | 38.8 | 21.6 | 46.2 | 60.7 | 35.7 | 31.7 | 88.6 | 0.0 | 0.0 | 342.53 |
| 4889-11017 Hydrogeologic Framework Model - Refine/ | 8.8 | 6.5 | -2.0 | 51.0 | 13.6 | 18.2 | -3.9 | 40.6 | 24.9 | 100.3 | 0.0 | 0.0 | 257.95 |
| 4889-11020 Groundwater Flow Modeling | 13.0 | 27.8 | 12.3 | 47.1 | 13.8 | 7.5 | 2.0 | 21.1 | 18.1 | 108.2 | 0.0 | 0.0 | 270.81 |
| 4889-11021 Technical Interactions - Regional Model | 1.8 | -1.8 | 0.0 | 0.0 | 10.6 | 5.7 | 0.1 | 1.4 | 4.2 | 6.6 | 0.0 | 0.0 | 28.64 |
| **8191224SU5** Regional Model | 29.1 | 38.9 | 17.6 | 136.9 | 59.6 | 77.7 | 58.8 | 98.8 | 78.8 | 303.7 | 0.0 | 0.0 | 899.93 |
| **GS522** USGS - SZ Flow & Trnsprt PMR - LA | 99.2 | 82.1 | 69.7 | 174.0 | 105.6 | 141.5 | 110.1 | 145.6 | 117.8 | 349.8 | 0.0 | 0.0 | 1,395.41 |
| 1.2.22.4.S | 99.2 | 82.1 | 69.7 | 174.0 | 105.6 | 141.5 | 110.1 | 145.6 | 117.8 | 349.8 | 0.0 | 0.0 | 1,395.41 |
| 4889-21345 Drift-Scale Test ESF | 11.8 | -2.5 | 7.5 | 4.7 | -2.7 | 21.5 | 8.0 | -0.9 | 21.2 | 7.3 | 0.0 | 0.0 | 75.89 |
| **8191224UU7** Drift-Scale Test ESF | 11.8 | -2.5 | 7.5 | 4.7 | -2.7 | 21.5 | 8.0 | -0.9 | 21.2 | 7.3 | 0.0 | 0.0 | 75.89 |
| **GS502** USGS - Near Field Envrn. PMR - LA | 11.8 | -2.5 | 7.5 | 4.7 | -2.7 | 21.5 | 8.0 | -0.9 | 21.2 | 7.3 | 0.0 | 0.0 | 75.89 |
| 4889-21303 Crossover Alcove (Alcove 8) | 29.2 | 28.3 | 31.6 | 12.5 | 22.1 | 24.1 | 29.8 | 44.8 | 100.7 | 19.9 | 0.0 | 0.0 | 342.99 |
| 4889-21384 ESF/Cross Drift Moisture Monitoring | 12.0 | 9.8 | 16.2 | 13.7 | 16.5 | 19.6 | 18.2 | 0.2 | 10.7 | 7.8 | 0.0 | 0.0 | 124.57 |
| 4889-21385 ECRB (Bulkhead) Moisture Monitoring | 10.4 | -3.0 | 3.4 | 15.3 | 6.5 | 8.2 | 8.0 | 31.6 | 62.1 | 21.2 | 0.0 | 0.0 | 163.80 |
| 4889-66666 Monitor for Liquid Water | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 |
| **8191224UU3** UZ Moisture Studies | 51.5 | 35.1 | 51.2 | 41.5 | 45.1 | 51.9 | 56.1 | 76.6 | 173.5 | 48.8 | 0.0 | 0.0 | 631.35 |
| 4889-22424 Surficial Carbonate Source Validation - Cr | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.29 |
| 4889-22425 Pore Water Geochemistry | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.3 | 1.2 | 5.9 | 0.0 | 0.0 | 13.39 |
| 4889-27009 Cl-36 Validation in the ESF | 10.7 | 11.9 | 9.3 | 9.6 | 18.7 | 15.2 | 8.7 | 31.8 | 7.0 | 24.1 | 0.0 | 0.0 | 147.12 |
| 4889-62213 Ages of Calcite/Opal Fracture/Cavity Coati | 38.7 | 33.0 | 24.7 | 60.0 | 11.3 | 32.3 | 25.3 | 65.0 | 27.2 | 46.0 | 0.0 | 0.0 | 363.52 |
| 4889-62219 Fluid Inclusions in Calcite/Opal | 20.8 | 25.9 | 26.6 | 28.7 | 55.8 | 43.7 | 25.3 | 73.1 | 15.0 | 39.5 | 0.0 | 0.0 | 354.38 |
| **8191224UU4** UZ Isotope Hydrology | 70.3 | 70.8 | 60.6 | 98.3 | 85.8 | 91.2 | 59.3 | 176.1 | 50.5 | 115.8 | 0.0 | 0.0 | 878.70 |
| 4889-21368 Busted Butte Mapping (Mineback) | 0.0 | 5.9 | 16.5 | 7.3 | 2.8 | 0.4 | 5.0 | 21.3 | 55.0 | 3.8 | 0.0 | 0.0 | 117.96 |
| 4889-22401 Excavation-induced Fracture Study | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.9 | 0.0 | 0.0 | 5.92 |
| 4889-22402 Supplemental Surface Fracture Study | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19.7 | 0.0 | 0.0 | 19.74 |

U.S. GEOLOGICAL SURVEY
ESTIMATED COSTS FOR October 1, 1999 - July 31, 2001
8/7/01 8:40:07 AM

| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4889-22403 Lithophysal Study in the ECRB Tptpll for E | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.00 |
| 4889-22404 3-D Fracture Network Depiction | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 9.47 |
| **8191224UU5** Mapping (USBR) | 0.0 | 5.9 | 16.5 | 7.3 | 2.8 | 0.4 | 5.0 | 21.3 | 55.0 | 42.0 | 0.0 | 0.0 | 156.10 |
| **GS520** USGS - UZ Flow & Trnsprt PMR - LA | 121.8 | 111.8 | 128.3 | 147.1 | 133.7 | 143.5 | 120.4 | 274.0 | 279.0 | 206.6 | 0.0 | 0.0 | 1,666.15 |
| 1.2.22.4.U | 133.6 | 109.3 | 135.8 | 151.8 | 131.0 | 165.0 | 128.4 | 273.1 | 300.2 | 213.9 | 0.0 | 0.0 | 1,742.03 |
| 1.2.22.4 | 274.9 | 222.5 | 262.7 | 368.2 | 319.1 | 370.0 | 293.0 | 472.3 | 467.9 | 640.3 | 0.0 | 0.0 | 3,690.99 |
| 4889-22607 Interpret WHB Geotechnical Data | 1.8 | 4.0 | 0.0 | -4.0 | 39.0 | 2.7 | 58.1 | 26.1 | 0.0 | 0.0 | 0.0 | 0.0 | 127.64 |
| **8191226TU4** Interpret WHB Geotechnical Data | 1.8 | 4.0 | 0.0 | -4.0 | 39.0 | 2.7 | 58.1 | 26.1 | 0.0 | 0.0 | 0.0 | 0.0 | 127.64 |
| 4889-22602 Deferred - Field Effort for WHB Geotechni | 12.5 | 28.1 | 27.8 | 34.6 | 27.0 | 44.3 | 32.9 | 0.0 | -1.8 | 0.2 | 0.0 | 0.0 | 205.60 |
| **8191226TUM** DEFERRED - Field Effort for WHB G | 12.5 | 28.1 | 27.8 | 34.6 | 27.0 | 44.3 | 32.9 | 0.0 | -1.8 | 0.2 | 0.0 | 0.0 | 205.60 |
| **GS8622** USGS Tst Coord/Sup for Site Activitie | 14.3 | 32.1 | 27.9 | 30.6 | 66.0 | 46.9 | 91.0 | 26.1 | -1.8 | 0.2 | 0.0 | 0.0 | 333.24 |
| 1.2.22.6.T | 14.3 | 32.1 | 27.9 | 30.6 | 66.0 | 46.9 | 91.0 | 26.1 | -1.8 | 0.2 | 0.0 | 0.0 | 333.24 |
| 1.2.22.6 | 14.3 | 32.1 | 27.9 | 30.6 | 66.0 | 46.9 | 91.0 | 26.1 | -1.8 | 0.2 | 0.0 | 0.0 | 333.24 |
| 4889-10712 KTI Meeting Support | 0.0 | 0.4 | 4.4 | 13.2 | 8.6 | 0.1 | 0.0 | 0.1 | 1.1 | 6.2 | 0.0 | 0.0 | 34.09 |
| **81912280U1** KTI Meeting Support | 0.0 | 0.4 | 4.4 | 13.2 | 8.6 | 0.1 | 0.0 | 0.1 | 1.1 | 6.2 | 0.0 | 0.0 | 34.09 |
| **GS503** Support Closure of NRC Key Technic | 0.0 | 0.4 | 4.4 | 13.2 | 8.6 | 0.1 | 0.0 | 0.1 | 1.1 | 6.2 | 0.0 | 0.0 | 34.09 |
| 1.2.22.8.0 | 0.0 | 0.4 | 4.4 | 13.2 | 8.6 | 0.1 | 0.0 | 0.1 | 1.1 | 6.2 | 0.0 | 0.0 | 34.09 |
| 1.2.22.8 | 0.0 | 0.4 | 4.4 | 13.2 | 8.6 | 0.1 | 0.0 | 0.1 | 1.1 | 6.2 | 0.0 | 0.0 | 34.09 |
| **1.2.22** | **289.2** | **255.1** | **295.0** | **412.0** | **393.6** | **417.0** | **384.0** | **498.5** | **467.2** | **646.7** | **0.0** | **0.0** | **4,058.33** |
| 1.2 OPERATING | 915.4 | 838.9 | 934.5 | 932.6 | 911.0 | 1,032.9 | 914.6 | 1,258.4 | 761.4 | 1,322.1 | 0.0 | 0.0 | 9,821.72 |
| CAPITAL EQUIPMENT | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| GRAND TOTAL | 915.4 | 838.9 | 934.5 | 932.6 | 911.0 | 1,032.9 | 914.6 | 1,258.4 | 761.4 | 1,322.1 | 0.0 | 0.0 | 9,821.72 |
| FTEs | | | | | | | | | | | | | |
| FEDERAL | 57.8 | 61.5 | 58.2 | 65.4 | 85.9 | 73.9 | 56.8 | 65.8 | 62.3 | 61.0 | 0.0 | 0.0 | |
| CONTRACT | 42.0 | 37.3 | 35.1 | 39.7 | 34.3 | 36.8 | 34.5 | 34.6 | 31.7 | 33.3 | 0.0 | 0.0 | |
| TOTAL | 99.8 | 98.7 | 93.3 | 105.1 | 120.2 | 110.7 | 91.3 | 100.5 | 94.0 | 94.2 | 0.0 | 0.0 | |

**YMP PLANNING AND CONTROL SYSTEM (PACS)**

MONTHLY COST/FTE REPORT

Participant U.S. Geological Survey
Date Prepared: 8/7/01 08:40 AM

Fiscal Month/Year July 31, 2001
Page 1 of 1

| | CURRENT MONTH END | | | | | | FISCAL YEAR | | |
|---|---|---|---|---|---|---|---|---|---|
| WBS ELEMENT | ACTUAL COSTS | PARTICIPANT HOURS | SUBCONTRACT HOURS | PURCHASE COMMITMENTS | SUBCONTRACT COMMITMENTS | ACCRUED COSTS | APPROVED BUDGET | APPROVED FUNDS | CUMMULATIVE COSTS |
| 1.2.1 | 37 | 658 | 152 | 0 | 06 | 0 | 448 | 0 | 351 |
| 1.2.3 | 798 | 5749 | 3192 | 0 | 507 | 0 | 7981 | 0 | 5663 |
| 1.2.4 | 21 | 111 | 72 | 0 | 29 | 0 | 212 | 0 | 89 |
| 1.2.5 | 45 | 296 | 656 | 0 | 47 | 0 | 610 | 0 | 415 |
| 1.2.8 | 72 | -10 | 0 | 0 | 0 | 0 | 598 | 0 | 487 |
| 1.2.9 | 130 | 1738 | 230 | 0 | 25 | 0 | 1152 | 0 | 1336 |
| 1.2.12 | 9 | 18 | 160 | 0 | 19 | 0 | 95 | 0 | 94 |
| 1.2.15 | 211 | 1253 | 727 | 0 | 91 | 0 | 2068 | 0 | 1386 |
| | 1323 | 9813 | 5189 | 0 | 724 | 0 | 13164 | 0 | 9821 |