United States Department of the Interior

U.S. GEOLOGICAL SURVEY
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IN REPLY REFER TO:

INFORMATION ONLY

October 14, 1999

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U. S. Department of Energy
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SUBJECT: Yucca Mountain Project Branch - U.S. Geological Survey (YMPB-USGS) Progress Report, September 1999

Attached is the USGS progress report in the required format for the month of September, 1999.

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:

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U.S. GEOLOGICAL SURVEY
EXECUTIVE SUMMARY

September 1999

COORDINATION and PLANNING

Processing of some 57 documents prepared by U.S. Geological Survey authors continued during September by the USGS-Yucca Mountain Project Branch. Of these listed documents, 26 are USGS reports (12 with hydrologic topics and 14 with geologic topics), six are journal articles (mostly on geologic topics), eight are Proceedings articles (split between six of hydrologic subject matter and two with geologic topics), and 17 are abstracts (split about evenly between geologic and hydrologic topics). Most of the USGS reports are water-resources investigations reports (WRIRs) or open-file reports (OFRs), and several are reports of mapping investigations (I-maps). Although no manuscripts were printed during September, a climate-synthesis report is at the printers.

During September, three publication packages (Open-File Report 98-635 by R.M. Forester and others; a journal article by F. D'Agnese and others; and an abstract by J. Paces and others) were sent to the Records Coordinator for transmittal to the RPC, and the related OSTI packages were sent to DOE. One PHSA records package (software documentation for MEAN and CMB-FRAC) was sent to the Records Coordinator for transmittal to the RPC.

GEOLOGY

The structural geology team continued to support various efforts. USGS scientific notebook SN-103 ("Structural Description of ESF Sampling Localities") was updated in preparation for technical review (and eventual close-out) in support of isotopic age studies. Fault-zone studies involved field examination of fault zones in the vicinity of Yucca Mountain and in areas surrounding the northern Amargosa Desert, in support of R. Dickerson's upcoming presentation to the Geological Society of America titled *Characteristics of fault zones at Yucca Mountain, Nevada.* That presentation and the accompanying abstract summarize preliminary findings from fault-zone work completed to date. Completion of the 1:50,000-scale SZ site-area geologic map has been delayed for revision arising from technical and editorial review, including truncation of depth shown in cross sections and associated changes to the text. The map and text are in final stages of processing. Editing of the digital 1:50,000-scale SZ site-area bedrock geologic map has been completed, and that Level 4 activity (**milestone SPG308M4 [Progress of Digital Bedrock Geologic Map]**) is complete as of September 30. The digital product is ready to be submitted to the USGS publications system for map lay-out, pending USGS Director's approval and DOE concurrence of the administrative report.

Continuing activity related to short-trace-length fracture studies included analysis of data for the small-scale fracture study and preparation of data that have been collected and reviewed for submittal to the project. Analysis and findings to date are scheduled to be presented in mid-October to DOE managers and project scientists working on process models and engineered barrier systems. A previously scheduled report on the short-trace-length fractures has been superseded by a planned FY2000 AMR, for which a development plan has been submitted.

HYDROLOGY

Unsaturated-Zone Hydrology

Monitoring of temperature, relative humidity, and barometric pressure continued in the ESF Main Drift and niches, and in Alcove #7. Data were collected from 51 heat-dissipation (HD) probes in Alcove #7. Eight surface-based HD probes monitored the soil moisture potential in and adjacent to the Ghost Dance fault. Twenty-one HD probes monitored the rock water potential in Niche #1. Final preparations are being made to finish data collection in the niches. Data packages have been assembled for the ESF Main-Drift measurements. The data package covering moisture monitoring in the ESF has been assembled, technically reviewed, and reviewed by a data checker. The DTN for that package is GS990908312242.011. The data package has been sent to Denver for additional review and is expected to be submitted to the RPC/TDB next month. In other data work, additional information has been added to the data package covering Alcove #1 infiltration experiments, and that data-package compilation is now complete. The DTN for the alcove package is GS990908312242.009. That package is now in checker review and is expected to be submitted next month. Planning for the Cross-Drift experiment continued; the first rounds of planning have been completed. In on-going tracer/ infiltration experiments in Alcove #1, some 49,703 gallons of water have been applied to date to the surface above Alcove #1. Seepage (which began on March 6, 1999) into the alcove has resulted in collection to date of about 4670 gallons of water. Continued monitoring of traced water has revealed no additional tracer since the fall-off to background levels in July 1999.

Several aspects of effort on infiltration modeling continued. Work continued on the first draft of the coupled-infiltration flow model AMR report. That effort has been re-directed to comply with YMP-PVAR procedures and is being conducted as an approved AMR under the AP-3.10Q procedure. Work continued on application of new QA procedures to FORTRAN software routines used for developing model input files and for post-processing of model results; associated work involved finalization of model test cases. Organization and compilation of input/output files, model codes, and test applications onto CD-ROMs continued, along with development of a user's manual.

Work on air-permeability testing culminated in completion of reviews of the North Ghost Dance fault (NGDF) testing report. The NGDF data package passed all reviews in July 1999, and reviews of the NGDF report were completed in September. That report was submitted to the DOE and to USGS Headquarters review on September 3.

Investigation of hydraulic properties at Busted Butte continued. A data package (GS990708312242.008) containing measurements of hydraulic properties was prepared, reviewed, and submitted for QA review in August, and that package was submitted to the the technical data group for final review and processing on September 8 in support of Level 4 milestone SPH913M4 [Hydrologic Properties of Busted Butte to RPC/TDB].

Water samples collected from the drift-scale test through the end of June for chemical and isotopic analysis have been analyzed for strontium and uranium isotopic compositions and concentrations. Preparation of the data packages for uranium and strontium isotopic analysis have been delayed due to unscheduled work by the two PIs involved in writing AMRs for other activities. There should be no impact on the schedule; preliminary data will be reported at the next scheduled quarterly workshop, and analyses of newly acquired samples will not be delayed. The data packages are expected to be prepared and checked by November 30 and submitted to the TDB by December 31.

Several efforts in hydrochemistry continued. In work on the correction of perched-water ages, PHREEQC (v.2.0) geochemical modeling software used to obtain ^{14}C residence times of the perched water was revised after review. P. Glynn (USGS) recalculated ^{14}C correction ages with the revised PHREEQC software. The draft report for USGS WRIR publication remains to be modified. Analytical efforts continued. Pore water was distilled, and dissolved CO_2 was extracted, from four ESF core samples. The CO_2 will be analyzed for carbon isotopes, and the pore water will be analyzed for tritium as part of the ^{36}Cl validation study. Pore water was extracted by centrifuge methods from one SD-9 core sample and from one SD-12 core sample. The extracted water (<1 ml) will be analyzed for major-ion chemistry.

In hydrochemical data-management work, water samples collected by centrifuge, compression and distillation methods during September were recorded in the water-collection database. The LKB Liquid Scintillation Counter was calibrated. The data package "Analysis of carbon-14, carbon 13/12 ratio, and stable isotope composition, during FY 98 and FY 99, in pore water and dissolved CO_2 extracted from boreholes SD-6, WT-24, UZ-7a, and SD-12" was prepared for technical review. The interpretive report for milestone SPH513M4 (UZ hydrochemical and isotopic data) was drafted and sent for editorial review. UZ Hydrochemistry personnel compiled and copied specimen custody reports, distillation records, calibration records, scientific notebook SN-102, and the tritium laboratory notebook for a data package containing tritium data. In addition, staff compiled electronic media of tritium data from DTN GS951208312272.004 (the original electronic media was lost by the records processing group) and verified the data with the original tritium laboratory notebooks. Staff also continued efforts to resolve the technical reviewer/checker comments for the data package "Analysis of tritium concentration, during FY 98 and FY 99, in pore water extracted from boreholes UZ-7A, UZ-14, NRG-7A, WT-24, SD-6, SD-7, SD-9, and SD-12."

Unscheduled work included efforts to determine the appropriate response to a deficiency report regarding YMP-USGS technical procedures HP-131 and HP-204, as well as NRC-mandated radiation-safety training (required every three years). I.C. Yang presented a

paper (*Carbon-14 activity of pore water obtained by vacuum distillation and one-dimensional compression methods on Yucca Mountain, Nevada, cores*) which was published in the Proceedings of the Third International Conference on Isotopes (Vancouver, Canada) held September 6—11, 1999. Staff provided materials requested by LANL for the UZ geochemistry AMR, including text contributions (on tritium interpretations) and compilation of DTN information for UZ hydrochemical data. Several scientific notebooks were closed out. Revisions were made to technical procedure HP-249 required for disposition of deficiency report LVMO-98-D-049.

Saturated-Zone Hydrology

De-mobilization of the C-well complex continued. The procurement package for closing calibrations by the manufacturer of transducers removed from boreholes UE-25 c#1 and c#3 was redone during September, and preparations for shipment were made. Closing calibrations are expected in October. Transducers were removed from borehole c#2 on September 20 (after lifting of the safety-related stop-work order), and those also will be shipped for closing calibrations. All downhole equipment and surface plumbing now has been removed from the C-well complex.

Water-level measurements included UE-25 J-11 and USW H-4 (upper and lower intervals) on September 7; USW H-5 (upper and lower intervals), USW H-3 (upper and lower intervals), and USW WT-1 on September 9; UE-25 WT#6, UE-25 WT#16, and UE-25 WT#15 on September 13; USW H-1 (tubes 1, 2, 3, and 4) and UE-25 WT#4 on September 14; USW WT-2, UE-25 p#1, UE-25 WT#14, UE-25 WT#12, and UE-25 J-12 on September 15; UE-25 J-13, USW VH-1, USW H-6 (upper and lower intervals), USW WT-7, and USW WT-10 on September 16; UE-25 WT#13 and USW G-2 on September 20; UE-25 WT#3 and UE-25 WT#17 on September 21; and USW WT-24 on September 23. Technical and checker reviews were completed on the third-quarter FY1999 water-level monitoring data package. That package was submitted to the RPC as of September 30.

Preparation of the data package for saturated-zone hydrologic testing in borehole USW SD-6ST1 continued during the month, largely focused on organization and compilation of data.

Work on SZ hydrology, isotopic studies, and hydrochemistry continued after resolution of the CAR against the National Water Quality Laboratory. Water samples collected from USW SD-6 were submitted to the lab for analysis on September 23. Analytical results are expected within four to eight weeks.

Numerous activities continued in support of development of Death Valley regional flow system (DVRFS) modeling, including compilation and synthesis of geologic cross sections and geologic map elements, work on incorporation of subsurface information, and enhancements in the hydrogeologic framework model. Various compilation and digitization efforts continued in the synthesis of the DVRFS regional geologic map. Work focused on digitization of the bedrock/alluvial contact along the east side of

Pahrump Valley along the Spring Mountains front and calculation of mountain-front sinuosity, including air-photo work. Field reconnaissance to locate channel cross sections along that front also was planned. Enhancements to the geologic mapping included incorporation of newer interpretations of fault alignments from various authors supported by gravity data and satellite imagery. Other updates included redefinition of the Kawich caldera, addition of the Bellehellen Lineament to the map, addition of structure names to the tectonic map and enhanced display of tectonic features (major fault zones, Tertiary intrusions, Precambrian basement rocks), and updating of the listing of map units and the correlation chart to include all units in the Halo area. In work on Quaternary deposits, interpretation and compilation of surficial geology for the Saline Valley and Darwin Hills 1:100,000-scale sheets within the DVRFS map area were completed. The maps have been submitted for digitization and incorporation into the regional map. Mapping will continue in the Death Valley Junction, Owlshead Mountains, and Ridgecrest (1:100,000-scale map) areas. Several days of fieldwork were completed in areas shown on the Indian Springs 1:100,000-scale sheet, focusing on the Indian Springs Valley, central and southern Three Lakes Valley, and White Sage Flat. (Entrance was gained to previously inaccessible areas of the Nellis Range through assistance of the USGS Nevada District.) Staff assisted the U.S. Air Force in the siting of a water well, worked in the southern Indian Springs Valley, and participated in a helicopter-flown gravity survey of those valleys. Data were collected at some 80 stations and annotated on topographic sheets and aerial photography. Staff completed review of parts of Rev. 4 of the NTS geologic map (Beatty, Pahute Mesa, Pahranagat Range, and Indian Springs areas), including depiction of Quaternary faults at Yucca Mountain. Minor edits have been submitted for incorporation following technical review of the bedrock geology. Surficial unit mapping of Rev. 4 will be compiled for direct incorporation into the DVRFS regional geologic map. Staff prepared and submitted a letter report summarizing progress to date of the interpretation and compilation of surficial geology in the Amargosa Desert at 1:250,000 scale for the regional geologic map. Other work involved interpretation of Quaternary and Tertiary units in the southern Amargosa Desert using Landsat imagery of the area of the Death Valley Junction 1:100,000-scale sheet. Compilation and editing of subsurface drill-hole data from some 800 sites in the Amargosa Farms area were completed, with focus on a specific subset of 117 boreholes with the best-constrained subsurface data. Those data will be used to develop depictions of subsurface geology in the Amargosa Desert area, using commercial software to construct three-dimensional surfaces of critical contacts, in lieu of the several cross sections originally envisioned. (Sections can be generated by the software once the surfaces have been produced.) Preliminary cross sections intersecting the six Nye County early-warning boreholes were completed and depicted generalized stratigraphy developed from field records and descriptions and from interpretations of drill cuttings. The sections were plotted in comparison to the depth to Paleozoic basement interpreted from several recently done gravity surveys in the area. A letter report was prepared and submitted to summarize progress to date in depiction of subsurface surfaces, required for reconstruction of subsurface geology in the Amargosa Desert area, from borehole and geophysical data.

As required by the criteria set out in the FY1999 work plan, 20 hydrogeologic sections have been completed in support of the Death Valley regional groundwater flow model. Preliminary, unreviewed versions of the cross sections have been submitted to YMP hydrologists for inspection. Those sections will be incorporated into the hydrogeologic framework model following revisions and technical review in FY2000. The cross sections represent completion on September 30 of Level 4 **milestone SPH761M4 [Hydrogeologic Sections Completed]**. Throughout FY1999, work on those regional cross-sections has focused on synthesis of existing geologic cross-section interpretations from YMP and NTS-UGTA Environmental Restoration Program investigations (activity SPH750 [Synthesize Geologic X-Sections]). Emphasis has been placed on resolving and documenting differences in the interpretations. A narrative description accompanies each cross section, and each narrative describes the data sources that were used and assumptions that were made during construction of that section. The narratives also contain a discussion of alternative geologic interpretations and documentation of comparisons to existing sections. During FY1999, the planning and construction of the cross sections was coordinated closely with other aspects of geologic work being conducted in support of the Death Valley regional groundwater flow model, in particular the geologic map compilation, the regional tectonic map, and regional gravity modeling. C. Fridrich (USGS Geologic Division) completed and submitted an open-file map report from the Oasis Valley investigation titled *Geologic map of the Oasis Valley basin and vicinity, Nye County, Nevada*, accompanied by a companion report titled *Geologic evaluation of the Oasis Valley basin, Nye County, Nevada.* The map-report pair includes two new cross sections across the Oasis Valley area. One of the sections is an updated version of part of a cross section previously produced for the DVRFS project.

Hydrogeologic work included synthesis of structures affecting regional flow and compilation of measured-section locations for the facies map of the lower clastic confining unit. Those data were used to produce a base map of locations for use in the facies study. A direct link was set up between ACCESS data-base files and ARCVIEW and used to derive data needed for facies analysis of Tertiary volcanic units. Macros were completed to reformat data from the hydrogeologic framework model and potentiometric surface compilations into ARC/INFO coverages and MODFLOW arrays. Compilation and synthesis of hydrochemical data continued. Staff completed the AMR package for potentiometric data. Final QA work is being completed. Software QA issues were identified for site-modeling tasks.

CLIMATE and PALEOHYDROLOGY

Staff continued work on the AMR for climate studies, with particular focus on future-climate analyses.

SPECIAL STUDIES

USGS input to Site Characterization Progress Report Number 21 (PR 21) was submitted to the NEPO coordinator and technical leads on September 20. Input consisted of seven pages of narrative descriptions of progress gleaned from USGS summary reports to YMSCO for April through August 1999. USGS technical progress discussed in the PR 21 input included the following:

- Development of the infiltration analysis and modeling report
- Evaluation of percolation flux across the repository horizon through moisture monitoring in the ECRB Cross Drift
- Characterization of seepage into drifts through moisture monitoring in Alcove #7 and tracer-infiltration experiments in Alcove #1
- Results from geothermal logging, air and core-water chemistry sampling, air-injection testing, and tracer testing in the Northern Ghost Dance Fault Alcove (Alcove #6)
- Contributions to the geochemistry analysis and modeling report
- Determination of percolation flux through analysis of $^{234}U/^{238}U$ ratios in pore water from the PTn in ESF Alcove #3 and from ESF sites within the Topopah Spring welded hydrogeologic unit (TSw)
- Drilling, hydraulic testing, and hydrochemical sampling of borehole USW SD-6ST1
- Technical and checker reviews of an analysis and modeling report for water levels and a revised potentiometric-surface map
- Continued refinement of the Death Valley regional flow system (DVRFS) ground-water model
- Review of aquifer-test analytical reports for Nye County drilling program wells EWDP-09S, EWDP-01S, and EWDP-03D
- Continued development and refinement of stratigraphic workbooks summarizing geophysical, stratigraphic, and lithologic information on boreholes at Yucca Mountain
- Continued work toward publication of the 1:50,000-scale geologic map of the site-scale saturated-zone flow-model area and the report on the geology of the ECRB Cross Drift
- Continued work on the ESF short-trace-length fracture study
- Matrix hydrologic-properties analysis of core samples of the Calico Hills nonwelded hydrogeologic unit (CHn) from the Busted Butte Test Facility
- Collection of hydrologic and properties data on materials being evaluated for potential use as backfill in waste-emplacement drifts of the potential repository as a part of the pilot-scale engineered-barrier (EBS) Phase II tests.

Updated publication status of USGS reports cited in previous progress reports also was provided. Follow-up work on PR 21 input and the Documentation of Program Change continued through the end of the month.

WATER-RESOURCES MONITORING

All data were downloaded from the 17 tipping-bucket gages. All stations were in good operating condition. The data are under review and have been assembled into electronic data records. The assembled data package has been submitted for technical and checker review. That package was sent to Denver for additional review. A data package (GS990908312111.001) was submitted to the technical data group for final review and processing on September 24 in support of Level 4 milestone SSH515M4 [Tipping bucket monitoring data to RPC/TDB].

USGS Level 3 Milestone Report

October 1, 1998 - September 30, 1999

Sorted by Baseline Date

Deliverable	Due Date	Expected Date	Completed Date	Comments
Letter Report: 4th Qtr FY98 **Milestone Number:** SSH14HM3	10/30/98	10/29/98	10/29/98	
Letter Report: 1st Qtr FY99 **Milestone Number:** SSH14IM3	1/29/99	1/28/99	1/28/99	
Preliminary Geologic Map for SZ Site Area **Milestone Number:** SPG258M3	3/5/99	9/30/99		
Submit UZ-7a & UZ-14 Rpt for Director's Approval **Milestone Number:** SPG630M3	3/15/99	9/30/99		
Ghost Dance Fault Data Pkg and Testing Report **Milestone Number:** SP3515M3	3/30/99	10/15/99		
Geology of ECRB X-Drift **Milestone Number:** SPG42GM3	3/31/99	10/29/99		
Letter Report: 2nd Qtr FY99 **Milestone Number:** SSH14JM3	4/30/99	4/29/99	4/29/99	
Letter Report: 3rd Qtr FY99 **Milestone Number:** SSH14KM3	7/30/99	7/30/99	7/30/99	
Summary Monitoring Through Calendar Year 1998 **Milestone Number:** SSH14NM3	9/15/99	9/13/99	9/13/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Report: Geometry & Chars of Fault Zones at YM **Milestone Number:** SPG452M3	9/30/99	12/30/99		

USGS Level 4 Milestone Report

October 1, 1998 - September 30, 1999

Sorted by Baseline Date

Deliverable	Due Date	Expected Date	Completed Date	Comments
Cross-Drift Q Stratigraphic Picks to TDB **Milestone Number:** SPG470M4	10/15/98	12/1/98	12/1/98	
Geologic Investigation Strategy Developed **Milestone Number:** SPH741M4	11/30/98	11/30/98	11/30/98	
Early Progress Model Calibration **Milestone Number:** SPH751M4	11/30/98	11/30/98	11/30/98	
UZ-7a & UZ-14 Draft Rpt to Tech Review **Milestone Number:** SPG626M4	12/2/98	12/9/98	12/9/98	
Index Map-Poten Areas Detail Geol Invest **Milestone Number:** SPH776M4	12/15/98	12/15/98	12/15/98	
Ist Qtr Status of Data Package Development **Milestone Number:** SP37A1M4	12/30/98	1/8/99	1/8/99	
1st Qtr Status Supp Line Org Doc Issues/Backlog **Milestone Number:** SE9601M4	12/31/98	12/31/98	12/31/98	
Water-Level Data 4th Qtr FY98 DP to RPC/TDB **Milestone Number:** SPH38PM4	12/31/98	12/31/98	12/31/98	
Well Data Compiled/Analyzed Detail Geol Invest **Milestone Number:** SPH772M4	12/31/98	12/23/98	12/23/98	
Preliminary Maps to Hydrologists **Milestone Number:** SPH742M4	1/15/99	1/15/99	1/15/99	
HFM-Progress Report I **Milestone Number:** SPH730M4	1/29/99	1/29/99	1/29/99	
Climate Tables for TSPA-LA **Milestone Number:** SPC316M4	2/1/99	2/19/99	2/19/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Status of Prow Pass Involvement **Milestone Number:** SPH401M4	2/12/99	2/12/99	2/12/99	
Replanned as part of SPH535M5 **Milestone Number:** SPH514M4	2/12/99	9/30/99	9/30/99	
Replanned as part of SPH338M5 **Milestone Number:** SPH336M4	2/19/99	9/30/99	9/30/99	
Replanned as SPH35M5 **Milestone Number:** SPH36M4	2/19/99	9/30/99	9/30/99	
Replanned as SPH29M5 **Milestone Number:** SPH28M4	2/26/99	9/30/99	9/30/99	
Mid-Yr Update on Evaluation of Transient Data **Milestone Number:** SPH703M4	2/26/99	2/26/99	2/26/99	
Progress on Regional Recharge Estimates **Milestone Number:** SPH729M4	2/26/99	2/26/99	2/26/99	
Dissolved Ion & Isotopic Analysis DP to RPC/TDB **Milestone Number:** SPH471M4	3/26/99	8/31/99	8/31/99	
2nd Qtr Status Supp Line Org Doc Issues/Backlog **Milestone Number:** SE9602M4	3/31/99	3/29/99	3/29/99	
2nd Qtr Status of Data Package Development **Milestone Number:** SP37A2M4	3/31/99	3/24/99	3/24/99	
Mid-Year Status EST Closeout Activities **Milestone Number:** SPC71AM4	3/31/99	3/31/99	3/31/99	
Mid Year Status-Tectonic Closeout **Milestone Number:** SPG221M4	3/31/99	8/5/99	8/5/99	
Mid-Year Status Topical Reports **Milestone Number:** SPG41AM4	3/31/99	3/30/99	3/30/99	
Mid-Year Status Peer Reviews **Milestone Number:** SPG51AM4	3/31/99	3/30/99	3/30/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Mid-Year Status KTIs **Milestone Number:** SPG61AM4	3/31/99	3/30/99	3/30/99	
Replanned as SPH537M5 **Milestone Number:** SPH517M4	3/31/99	9/30/99	9/30/99	
Mid-Yr Update on Regional SZ Mdlg Data Merge **Milestone Number:** SPH701M4	3/31/99	3/31/99	3/31/99	
Mid-Yr Update on Regional Spatial Data Merge **Milestone Number:** SPH707M4	3/31/99	3/31/99	3/31/99	
Core Geologic Sections Completed **Milestone Number:** SPH753M4	3/31/99	3/31/99	3/31/99	
Update Regional SZ Hydrochem Data I **Milestone Number:** SPH755M4	3/31/99	3/31/99	3/31/99	
Replanned as SPH506M5 **Milestone Number:** SPH777M4	3/31/99	9/30/99	9/30/99	
Water-Level Data 1st Qtr FY99 DP to RPC/TDB **Milestone Number:** SPH38QM4	4/30/99	4/30/99	4/30/99	
Cancel-Incorporated into 8191213UU1 **Milestone Number:** SPH442M4	4/30/99	9/30/99	9/30/99	
Letter Rpt: Rslts PA Wkshps & Sensit Analyses **Milestone Number:** SPH608M4	4/30/99	4/13/99	4/13/99	
Mid-Year Progress Model Calibration **Milestone Number:** SPH719M4	4/30/99	4/30/99	4/30/99	
Geol Interps-Progress Report I **Milestone Number:** SPH743M4	4/30/99	4/30/99	4/30/99	
HFM-Progress Report II **Milestone Number:** SPH731M4	5/28/99	5/28/99	5/28/99	
Cancel-Incorporated into 8191213UU3 **Milestone Number:** SPG291M4	6/1/99	9/30/99	9/30/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Replanned as SPH918M5 **Milestone Number:** SPH913M4	6/15/99	9/30/99	9/30/99	
3rd Qtr Status of Data Package Development **Milestone Number:** SP37A3M4	6/30/99	6/30/99	6/30/99	
Cancel-Incorporated into 8191213UU1 **Milestone Number:** SPH446M4	6/30/99	9/30/99	9/30/99	
Geol Interps-Progress Report II **Milestone Number:** SPH744M4	6/30/99	6/30/99	6/30/99	
Preliminary Geologic Map to Hydrologists **Milestone Number:** SPH745M4	6/30/99	6/30/99	6/30/99	
Geol Interps Completed **Milestone Number:** SPH747M4	6/30/99	6/30/99	6/30/99	
Replanned as SP6B341M5 **Milestone Number:** SP6B34M4	7/30/99	9/30/99	9/30/99	
Implications of New Data Impacting PSHA **Milestone Number:** SPG751M4	7/30/99	9/16/99	9/16/99	
Water-Level Data 2nd Qtr FY99 DP to RPC/TDB **Milestone Number:** SPH38RM4	7/30/99	8/9/99	8/9/99	
Replanned as SPH110M5 **Milestone Number:** SPH111M4	8/2/99	9/30/99	9/30/99	
Yr-End Update on Evaluation of Transient Data **Milestone Number:** SPH705M4	8/31/99	8/30/99	8/30/99	
Cancel - Incorporated into 8191213UU1 **Milestone Number:** SPC317M4	9/3/99	9/30/99	9/30/99	
Replanned as SPH477M5 **Milestone Number:** SPH473M4	9/17/99	9/30/99	9/30/99	
Replanned as SPH533M5 **Milestone Number:** SPH513M4	9/17/99	9/30/99	9/30/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Replanned as SPH291M5 **Milestone Number:** SPH333M4	9/24/99	9/30/99	9/30/99	
Replanned as SPH535M5 **Milestone Number:** SPH515M4	9/24/99	9/30/99	9/30/99	
4th Qtr Status of Data Package Development **Milestone Number:** SP37A4M4	9/30/99	9/30/99	9/30/99	
End-Yr Status EST Closeout Activities **Milestone Number:** SPC72AM4	9/30/99	9/30/99	9/30/99	
End Year Status-Tectonic Closeout **Milestone Number:** SPG222M4	9/30/99	9/30/99	9/30/99	
Cancel-Incorporated into 8191213UU3 **Milestone Number:** SPG292M4	9/30/99	9/30/99	9/30/99	
Progress of Digital Bedrock Geologic Map **Milestone Number:** SPG308M4	9/30/99	9/30/99	9/30/99	
Cancel **Milestone Number:** SPG42AM4	9/30/99	9/30/99	9/30/99	
Replanned as SPG461M5 **Milestone Number:** SPG460M4	9/30/99	9/30/99	9/30/99	
Cancel **Milestone Number:** SPG52AM4	9/30/99	9/30/99	9/30/99	
Cancel **Milestone Number:** SPG62AM4	9/30/99	9/30/99	9/30/99	
Replanned as SPG851M5 **Milestone Number:** SPG87M4	9/30/99	9/30/99	9/30/99	
Replanned as SPG861M5 **Milestone Number:** SPG88M4	9/30/99	9/30/99	9/30/99	
Replanned as SPH345M5 **Milestone Number:** SPH30M4	9/30/99	9/30/99	9/30/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Replanned as SPH338M5 **Milestone Number:** SPH337M4	9/30/99	9/30/99	9/30/99	
Replanned as SPG355M5 **Milestone Number:** SPH372M4	9/30/99	9/30/99	9/30/99	
Replanned as part of SPH35M5 **Milestone Number:** SPH37M4	9/30/99	9/30/99	9/30/99	
Replanned as SPH188M5 **Milestone Number:** SPH38VM4	9/30/99	9/30/99	9/30/99	
Cancel-Incorporated into 8191213UU1 **Milestone Number:** SPH444M4	9/30/99	9/30/99	9/30/99	
Cancel-Incorporated into 8191213UU1 **Milestone Number:** SPH448M4	9/30/99	9/30/99	9/30/99	
Replanned as SPH48BM5 **Milestone Number:** SPH45AM4	9/30/99	9/30/99	9/30/99	
Replanned as SPH295M5 **Milestone Number:** SPH469M4	9/30/99	9/30/99	9/30/99	
Report Status of Nye CO Drilling Oversight FY99 **Milestone Number:** SPH482M4	9/30/99	9/29/99	9/29/99	
Prelim Site SZ Hydrogeo Frmk Model **Milestone Number:** SPH618M4	9/30/99	9/30/99	9/30/99	
Yr-End Update on Regional SZ Mdlg Data Merge **Milestone Number:** SPH702M4	9/30/99	9/27/99	9/27/99	
Yr-End Update on Regional Spatial Data Merge **Milestone Number:** SPH709M4	9/30/99	9/30/99	9/30/99	
Tectonic Map to Review **Milestone Number:** SPH713M4	9/30/99	9/30/99	9/30/99	
Prelim Maps to Hydrologists **Milestone Number:** SPH714M4	9/30/99	9/30/99	9/30/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Year-End Progress Model Calibration **Milestone Number:** SPH737M4	9/30/99	9/30/99	9/30/99	
Death Valley Map to Review **Milestone Number:** SPH746M4	9/30/99	9/30/99	9/30/99	
Geol Interps-Progress Report III **Milestone Number:** SPH748M4	9/30/99	9/30/99	9/30/99	
Update Regional SZ Hydrochem Data II **Milestone Number:** SPH756M4	9/30/99	9/30/99	9/30/99	
Replanned as SPH520M5 **Milestone Number:** SPH757M4	9/30/99	9/30/99	9/30/99	
Hydrogeologic Sections Completed **Milestone Number:** SPH761M4	9/30/99	9/30/99	9/30/99	
Replanned as SPH508M5 **Milestone Number:** SPH770M4	9/30/99	9/30/99	9/30/99	
Replanned as SPH504M5 **Milestone Number:** SPH774M4	9/30/99	9/30/99	9/30/99	
Replanned as SSH525M5 **Milestone Number:** SSH515M4	9/30/99	9/30/99	9/30/99	

YMP PLANNING AND CONTROL SYSTEM (PACS)

MONTHLY COST/FTE REPORT

Participant U.S. Geological Survey
Date Prepared 10/13/99 10:38 AM

Fiscal Month/Year September 30, 1999

	CURRENT MONTH END						FISCAL YEAR		
SPAM	ACTUAL COSTS	PARTICIPANT HOURS	SUBCONTRACT HOURS	PURCHASE COMMITMENTS	SUBCONTRACT COMMITMENTS	ACCRUED COSTS	APPROVED BUDGET	APPROVED FUNDS	CUMMULATIVE COSTS
AMJX	40	384	596	0	0	0	639	639	521
AMMQ	65	0	0	0	0	0	123	123	121
AMNE	-55	1422	220	0	0	0	1183	1183	1000
AMNT	-47	80	170	0	0	0	35	35	26
AMNW	908	9370	2457	0	0	0	7972	7972	7139
AMPP	471	3606	2357	0	0	0	3360	3360	2944
AMPW	120	1825	975	0	0	0	2431	2431	2348
AMRF	18	416	132	0	0	0	200	200	180
	1520	17103	6907	0	0	0	15943	15943	14279

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
0G535HB1 Provide Technical Data Coordination	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	39.3	39.7	33.6	452.47
81912470U1 **Technical Data Management FY99**	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	39.3	39.7	33.6	452.47
81912470	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	39.3	39.7	33.6	452.47
0GC522HB1 Conduct Satellite Records Operations	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	4.2	4.3	6.8	68.23
81919197U1 **USGS Satellite Records Operations**	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	4.2	4.3	6.8	68.23
81919197	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	4.2	4.3	6.8	68.23
AMJX	49.1	39.9	53.3	29.6	39.2	45.8	44.4	45.9	45.8	43.4	44.1	40.4	520.70
0G4XXHB1 EBS Testing for LADS - Backfill (Before	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	3.5	65.0	121.37
81912382U1 **EBS Testing for LADS**	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	3.5	65.0	121.37
81912382	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	3.5	65.0	121.37
AMMQ	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	3.5	65.0	121.37
0G32212HB5 Evaluate Short Trace Length Fract. Distr	0.0	0.0	0.0	0.0	0.0	0.0	4.3	24.1	26.5	13.0	10.1	9.2	87.19
0G32212HB7 Conduct Geologic Mapping of the ECRB	0.0	16.3	78.0	77.4	71.7	58.0	48.8	18.0	-0.2	49.8	34.4	-115.1	337.00
81912050U2 **Geologic Testing in the ECRB FY99**	0.0	16.3	78.0	77.4	71.7	58.0	53.1	42.0	26.3	62.8	44.5	-105.8	424.19
0G33124HB8 Eval Percolation Flux Across Repository	3.6	12.6	16.8	21.9	24.9	-2.9	16.5	49.7	43.9	26.8	19.7	46.5	279.90
0G33124HBD Conduct Moisture Monitoring in the ESF	17.1	27.8	20.5	21.6	13.9	20.2	0.1	-111.9	0.0	-9.3	14.0	-14.0	0.00
0G36221HB4 Cond E-W X-Drift Frac Min Dtng & Isoto	21.2	-14.1	4.9	2.7	-0.5	3.9	9.0	31.8	16.0	20.7	51.5	18.7	165.66
81912050U3 **Moisture Monitoring & Infiltration St**	41.9	26.3	42.3	46.2	38.2	21.2	25.6	-30.4	59.9	38.2	85.1	51.2	445.56
0G32212FB5 Conduct Geologic Mapping of the ECRB	75.0	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	130.00
81912050UX **Geologic Mapping of the ECRB (Def**	75.0	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	130.00
81912050	116.9	97.6	120.3	123.6	109.9	79.1	78.7	11.6	86.1	101.0	129.6	-54.6	999.76
AMNE	116.9	97.6	120.3	123.6	109.9	79.1	78.7	11.6	86.1	101.0	129.6	-54.6	999.76
0G4XXHB1 EBS Testing for LADS - Backfill (After 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.8	64.3	-47.2	25.54
81912383U1 **EBS Testing for LADS**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.8	64.3	-47.2	25.54
81912383	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.8	64.3	-47.2	25.54

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	AMNT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.8	64.3	-47.2	25.54
0G33124HBB	Conduct Air-K & Hydrochemistry Testing	62.0	11.7	23.1	11.6	4.0	11.9	2.5	0.0	2.1	-2.2	3.1	2.2	131.98
0G33124HBF	Characterize Seepage into Alcoves I	14.1	18.6	18.7	8.8	13.8	0.8	2.7	0.0	2.3	22.2	3.6	-9.9	95.76
0G33124HBG	Characterize Seepage into Alcoves II	1.7	4.1	7.7	21.1	23.7	12.6	0.0	40.6	0.0	4.1	0.0	8.6	124.28
0G33127HB2	Conduct Isotopic & Hydrochemical Analy	16.2	20.8	26.3	6.4	9.3	11.6	12.3	12.4	3.5	0.4	0.3	1.6	121.01
0G36221HB1	Conduct Fluid Inclusion Studies	4.4	20.9	12.0	10.0	11.7	8.3	14.6	-7.6	9.9	0.4	7.8	6.6	99.01
0G36221HB3	Cond Frac Mineral Dtg & Iso Analy - ES	32.2	21.3	16.2	19.9	23.0	15.0	9.0	0.9	7.6	-16.5	4.2	3.4	136.25
81912025U1	**Moisture Monitoring & Fault Fractur**	130.7	97.4	104.0	77.8	85.5	60.3	41.1	46.4	25.4	8.4	19.1	12.4	708.28
0G36221HB5	Water Flux Thru Repository Block	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.9	0.0	0.0	0.0	0.0	3.98
81912025UX	**Geochronology of Fracture Minerals**	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.9	0.0	0.0	0.0	0.0	3.98
	81912025	130.7	97.4	104.0	77.8	85.6	60.3	41.1	50.2	25.4	8.4	19.1	12.4	712.27
0G33131HB2	Cond. Hydraulic & Tracer Testing of Pro	39.9	34.4	57.9	-1.5	15.2	0.8	3.1	1.3	3.6	-2.4	0.7	19.8	172.85
0G33132HB1	Cond Isotopic & Hydrochemical Studies	8.6	29.9	26.8	3.4	16.4	25.5	14.8	30.9	38.7	-4.5	2.8	11.1	204.44
0G36221HB8	Paleodischarge at Nye County Sites	0.0	0.0	0.0	0.0	0.0	0.0	2.8	8.0	0.0	14.3	0.0	8.2	33.35
0G3XXXXHB1	Oversee Nye County Drilling Program	8.3	-5.2	4.8	1.9	11.8	7.2	19.0	11.0	-1.3	0.7	0.0	-3.4	55.05
0G3XXXXHB3	Provide SMF Well-Site Support	0.0	3.9	30.9	36.5	27.0	22.9	6.5	-1.4	3.4	0.5	0.0	0.0	130.18
81912029U1	**SZ Data Analysis for SR FY99**	56.8	62.9	120.5	40.3	70.5	56.5	46.2	49.9	44.4	8.6	3.5	35.8	595.87
	81912029	56.8	62.9	120.5	40.3	70.5	56.5	46.2	49.9	44.4	8.6	3.5	35.8	595.87
0G33133HB?	Comp. Geo. Interpretations - Geologic M	7.4	16.0	12.3	9.9	12.7	12.8	11.9	5.0	10.3	6.6	-4.6	3.3	103.68
0G33133HB2	Conduct LA SZ Flow Model Sensitivity A	0.0	3.0	5.6	2.1	8.5	9.0	14.6	-6.8	0.3	5.1	3.9	-4.9	40.38
0G33133HB3	Refine Geologic Framework Model	0.0	0.4	8.4	3.1	3.5	6.7	7.3	9.8	18.9	18.7	7.2	25.9	110.04
0G33133HBB	Develop Regional SZ Model	0.0	6.3	15.6	23.0	39.9	25.1	32.2	18.2	21.6	32.0	10.4	20.5	244.78
0G33133HBD	Comp. Geo. Interpretations - Hydrostruc	2.4	13.6	-0.7	6.2	4.2	5.2	9.9	4.5	11.9	3.2	1.9	6.3	68.71
0G33133HBE	Comp. Geo. Interpretations - Cross Sect	2.1	6.5	17.5	9.7	13.7	13.8	16.8	11.7	20.1	11.7	10.9	10.4	144.78
0G33133HBF	Comp. Geo. Interpretations - Amargosa	2.5	10.7	7.2	8.9	10.1	10.4	7.5	15.4	9.2	17.5	12.0	6.5	118.05
0G33133HBG	Hydrogeologic Framework Model	8.1	2.5	-6.0	0.9	9.6	6.6	3.5	9.1	9.7	8.6	16.7	18.9	88.15
0G33133HBH	Reduce Uncertainty - Recharge Work	0.0	0.0	2.2	0.8	1.9	3.0	3.7	3.0	2.8	-2.5	7.5	16.4	38.88
0G33133HBI	Reduce Uncertainty - Hydrochemical Flo	0.0	0.0	3.5	6.0	12.3	6.5	10.4	2.0	5.6	29.6	39.3	68.8	184.02
0G33133HBJ	Ground Water Flow Modeling	0.4	12.7	20.7	9.0	6.4	15.2	6.7	9.5	17.4	40.1	9.0	16.1	163.22
81912031U1	**Regional and Site Scale Saturated Z**	22.9	71.8	86.4	79.6	123.1	114.1	124.6	81.5	127.9	170.6	114.0	188.2	1,304.70

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0G33132HB2	Iso & Hhdrochem Studies SZ Water (WT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	0.6	39.69
0G33133HB7	Refine Regional Hydrogeologic Framew	0.0	0.0	85.3	-85.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G33133HBA	Reduce Uncertain Flux Values to Calibra	0.0	0.0	0.8	7.2	16.4	13.3	18.7	21.3	8.6	39.8	93.5	28.9	248.69
81912031UX	**SZ Modeling & Hydrochem Studies (**	0.0	0.0	86.1	-78.1	16.4	13.3	18.7	21.3	8.6	78.9	93.5	29.6	288.38
81912031		22.9	71.8	172.6	1.5	139.5	127.4	143.3	102.8	136.5	249.4	207.5	217.7	1,593.08
0G32211HB3	Complete Stratigraphic Descriptions UZ-	0.6	8.3	11.8	4.0	7.8	4.1	1.5	2.2	1.0	0.1	2.8	0.0	44.17
0G32211HB5	Correlate Lithostratigraphy & Geophysic	0.0	0.0	0.2	0.8	0.0	0.0	0.2	31.7	14.4	8.1	18.2	23.0	96.57
0G32212HB1	Provide Structural Support to Isotopic Ag	4.0	0.2	6.8	2.9	2.0	2.7	0.6	0.6	2.6	1.9	3.6	3.9	31.85
0G32212HB2	Conduct Fracture Syn in Sup of Reposit	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
0G32212HB3	Conduct Spatial Analysis of Fracture Int	0.4	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G32212HB4	Provide Geo Sup to LBNL Geophys Inve	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
0G32212HB6	Char. Structure of Alcove - X-Drift Infil. E	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
0G32212HB8	Conduct Fault Zone Studies	0.9	5.8	3.5	10.8	2.7	3.0	4.3	9.9	-1.0	9.8	6.5	31.6	87.77
0G32212HB9	Provide Structural Support to TSPA/VA	29.8	18.9	9.8	13.5	13.1	13.0	24.1	2.5	3.4	5.9	8.1	34.5	176.59
0G395HB1	Provide USGS Support to 3-D Model: G	17.4	0.0	-9.3	-3.9	14.2	8.9	15.4	10.4	43.9	13.3	9.6	8.1	128.02
0G395HB2	Provide USGS Support to 3-D Model: St	0.0	0.0	0.0	11.4	0.4	0.0	0.0	0.0	3.4	9.2	8.6	16.7	49.63
81912210U1	**Geologic Studies FY99**	53.1	32.8	22.8	39.4	40.1	31.6	46.2	57.4	67.6	48.3	57.4	117.8	614.60
0G32211HB2	Conduct Stratigraphic Descriptions	8.9	14.0	-0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.12
81912210UX	**Stratigraphic Description of SD6WT2**	8.9	14.0	-0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.12
81912210		62.0	46.8	22.6	39.8	40.1	31.6	46.2	57.4	67.6	48.3	57.4	117.8	637.73
0G33123HB2	Hydraulic properties - Busted Butte Core	0.0	4.6	-0.7	0.8	1.2	21.6	28.6	49.1	28.7	19.5	7.4	5.6	166.43
0G33124HBF	Characterize Seepage into Alcoves I	0.0	13.7	13.0	0.5	-10.3	1.4	7.5	3.1	15.4	8.8	10.5	25.0	88.62
0G33124HBG	Characterize Seepage into Alcoves II	0.0	4.3	0.0	0.0	2.3	8.3	52.3	-5.7	13.0	10.6	2.0	53.4	140.60
0G33127HB2	Cond Iso/Hydrochem Studies of UZ & P	0.0	0.0	0.0	0.0	1.4	0.0	9.3	4.3	15.4	17.7	21.9	28.1	98.00
0G33127HB4	Chlorine 36 Validation Studies	0.0	0.0	0.0	0.0	9.5	8.8	12.5	6.9	19.7	6.8	5.0	7.4	76.61
0G36221HB1	Continue Fluid Inclusion Studies	0.0	0.0	0.0	0.0	0.0	0.0	20.8	33.1	29.1	30.6	12.2	51.3	177.04
0G36221HB1	Continue Fluid Inclusion Sutdies	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
0G36221HB9	Continue Frac Min Dtg & Isotopic Anlys	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	13.34
81912215U1	**Moisture Monitoring & Fault Fractur**	0.0	22.6	12.4	1.3	4.0	40.1	131.0	90.8	121.3	107.4	59.0	170.8	760.64
0G36221HB7	Paleodischarge/Paleoclimate - Deferred	0.0	0.0	15.2	8.4	0.1	7.3	4.7	4.3	-1.7	0.4	0.8	2.0	41.52
81912215UX	**Paleodischarge/Paleoclimate (Deferr**	0.0	0.0	15.2	8.4	0.1	7.3	4.7	4.3	-1.7	0.4	0.8	2.0	41.52

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81912215		0.0	22.6	27.6	9.7	4.1	47.5	135.7	95.0	119.6	107.8	59.8	172.9	802.16
0G54XX	Provide Support to Performance Assess	0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	-23.3	13.2	7.8	63.31
81912220U1	**USGS Support to Performance Asse**	0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	-23.3	13.2	7.8	63.31
81912220		0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	-23.3	13.2	7.8	63.31
0G33131HB3	C-Well Demobilization	0.0	0.0	0.0	0.0	0.0	0.7	1.8	4.9	12.7	11.8	14.8	30.4	77.25
0G33131HB3	Planning for Alluvial Tracer Complex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	5.76
0G33132HB1	Cond Isotopic & Hydrochemical Studies	0.0	0.0	0.0	0.0	0.7	0.4	3.6	-2.6	7.3	23.5	1.4	9.7	43.91
0G36221HB9	Paleodischarge at Nye County Sites	0.0	0.0	0.0	0.0	2.8	0.0	0.0	7.3	6.9	18.9	30.0	5.4	71.32
0G3XXXXHB2	Oversee Nye County Drilling Program	0.0	0.0	0.0	0.0	0.0	0.9	8.4	8.7	4.9	4.6	4.2	6.6	38.36
81912245U1	**SZ Data Analysis for SR/LA FY99**	0.0	0.0	0.0	0.0	3.5	2.0	13.8	18.3	31.8	58.8	50.5	57.8	236.60
0G33127HB3	Iso & Hydrochem Studies of UZ Water a	0.0	3.9	7.9	12.1	8.2	9.4	6.9	10.6	9.0	9.0	4.1	4.6	85.71
0G33131HBG	SZ Hydrologic Testing	9.0	7.2	2.8	4.9	9.2	6.1	13.0	22.7	44.7	20.5	27.3	14.2	181.63
81912245UX	**SZ Testing & UZ Hydrochemistry (De**	9.0	11.2	10.6	17.0	17.3	15.5	20.0	33.3	53.7	29.5	31.4	18.8	267.35
81912245		9.0	11.2	10.6	17.0	20.9	17.6	33.8	51.7	85.5	88.3	81.9	76.6	503.95
0G39BHB9	Support Preparation of the WDLA	26.3	23.1	54.1	24.5	40.0	45.1	40.7	33.4	46.5	75.5	49.6	65.6	524.40
81916105U1	**Support for Preparation of the WDL**	26.3	23.1	54.1	24.5	40.0	45.1	40.7	33.4	46.5	75.5	49.6	65.6	524.40
0G32836HB1	Rvw Impacts of New Data on Volcanic &	15.7	-11.4	22.6	5.6	5.2	6.9	2.2	5.1	13.0	-0.9	0.0	7.3	71.25
0G32XXXHB1	LADS Support - Expansion Area	0.0	0.0	1.3	0.0	0.0	0.0	0.4	0.0	6.0	0.0	0.0	0.0	7.70
0G33129HB1	Provide Updated UZ Model Abstractions	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
0G331XXHB1	Provide Support to Flow & Transport Mo	3.9	7.9	5.0	8.8	-0.4	1.0	9.2	-1.9	0.0	-15.4	0.0	0.0	18.14
0G33XXXHB1	LADS Support	0.0	5.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	19.04
81916105U2	**Review of Literature and Special Stu**	19.7	1.6	28.6	14.4	4.8	7.8	11.8	3.2	19.0	-16.3	0.0	21.6	116.13
0G32836HB2	Tectonic Closeout Activities	0.0	1.5	0.9	1.8	7.7	5.0	43.2	21.3	8.7	38.1	35.3	11.8	175.35
0G33121HB1	Coupled Infiltration Surface Water Flow	0.0	1.8	4.7	4.4	15.7	28.9	13.9	44.2	16.4	50.1	55.6	27.5	263.11
0G33123HB1	Surface Based Testing Closeout Activitie	0.0	9.1	46.7	44.5	34.2	31.1	27.6	41.1	27.4	44.8	34.6	59.4	400.41
0G36221HB6	Climate Closeout Activities	0.0	12.1	49.1	19.4	21.6	53.2	8.7	19.9	43.5	10.7	28.3	48.1	314.65
0G39BHA1	Support Peer Reviews	4.9	-2.0	-0.5	0.0	0.0	2.1	0.0	2.1	0.0	0.0	0.0	-4.1	2.54
0G39BHA1	Support Semiannual Progress Reports	0.0	5.0	2.3	0.4	0.0	2.7	5.0	-1.1	0.2	0.0	0.0	6.1	20.59
0G39BHA1	Supports KTIs	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
0G39BHA1	Support Topical Rpts; NWTRB, ACNW,	5.8	-5.1	0.5	1.9	3.2	18.2	8.1	3.5	-0.4	1.3	0.7	0.0	37.77

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0G39HB1	Support Closeout Activities	0.0	0.0	0.0	4.9	5.9	36.9	15.7	36.6	33.1	19.3	27.2	27.9	207.57
0G39HB2	Support Hydrologic Modeling Team Clos	0.0	0.0	0.0	0.0	4.4	20.5	11.1	10.9	18.9	9.4	4.0	9.3	88.36
81916105U3	**Technical Interactions and Special P**	10.7	22.3	103.7	77.5	92.7	198.7	133.3	178.5	147.7	173.6	185.7	185.9	1,510.35
81916105		56.7	47.0	186.4	116.4	137.5	251.6	185.8	215.0	213.2	232.9	235.3	273.1	2,150.88
0G33127HB1	Conduct Chem. & Isotopic Analyses Drift	9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	2.3	3.6	-5.9	80.11
81916107U1	**Isotope Support for Thermal Testing**	9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	2.3	3.6	-5.9	80.11
81916107		9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	2.3	3.6	-5.9	80.11
	AMNW	348.2	383.8	655.1	330.2	513.6	603.7	642.5	632.9	717.2	722.7	681.2	908.3	7,139.35
0G1CHB1	Conduct Engineering Assurance Activitie	38.0	36.6	38.7	35.1	40.4	44.4	38.6	40.8	39.1	44.3	46.9	50.6	493.62
81912019U1	**Engineering Assurance FY99**	38.0	36.6	38.7	35.1	40.4	44.4	38.6	40.8	39.1	44.3	46.9	50.6	493.62
0G1CHB2	Personnel Qualifications - Deferred	3.0	3.9	4.3	3.5	3.9	2.2	0.3	-0.7	3.2	3.0	5.6	5.2	37.49
0G1CHB2	Support Line Org. Doc. Issues/Backlog	2.8	3.0	1.7	2.9	7.8	9.7	8.6	6.3	3.7	2.8	5.1	6.0	60.64
81912019UX	**Support Line Organization, Docume**	5.9	6.9	6.0	6.5	11.7	11.9	8.9	5.6	6.9	5.8	10.7	11.2	98.12
81912019		43.9	43.6	44.7	41.6	52.2	56.3	47.5	46.4	46.0	50.1	57.6	61.9	591.75
	Core Library -- NV District	0.0	3.4	2.5	2.4	4.3	1.0	4.6	2.2	0.5	1.3	2.2	0.7	25.00
	Unfunded Work	91.7	97.0	-23.4	-11.6	-1.7	-50.5	-86.4	0.4	5.6	10.1	-20.5	-10.7	0.00
0G31HB1	Support Scientific Programs Mgmt & Int	9.8	24.6	16.0	21.8	17.2	22.3	22.4	19.1	18.4	18.6	17.6	24.4	232.35
0G31HB2	Manage Nevada Operations/Earth Scien	40.4	57.7	45.8	37.6	29.2	39.8	48.2	25.6	13.7	39.1	37.1	33.9	448.15
81919090U1	**USGS SP&I FY99**	141.9	182.7	40.9	50.2	49.1	12.5	-11.3	47.3	38.2	69.1	36.5	48.3	705.50
0G39BHA1C	Provide Site Investigations Technical Su	27.1	38.5	34.1	55.6	40.0	46.3	65.6	85.7	104.1	108.0	99.0	267.0	971.04
0G39BHA1D	Provide Quality Checks for Documents	0.0	0.0	0.0	1.3	8.0	8.0	3.1	11.7	6.6	12.3	4.7	4.3	59.91
81919090U3	**USGS Site Investigations Technical**	27.1	38.5	34.1	56.9	48.1	54.2	68.6	97.5	110.7	120.3	103.7	271.3	1,030.95
0G39BHA1F	Support QA Compliance, Implementatio	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
81919090U4	**QA Compliance, Implementation, an**	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
81919090		169.0	221.2	75.0	107.2	97.1	66.8	57.4	144.8	148.9	189.4	140.2	319.5	1,736.45
0G825HB1	Implement Federal Safety & Occupation	6.8	7.6	7.9	7.9	6.7	8.8	7.8	8.7	9.0	8.0	8.1	10.6	97.87
81919121U1	**Federal Occupational Safety & Healt**	6.8	7.6	7.9	7.9	6.7	8.8	7.8	8.7	9.0	8.0	8.1	10.6	97.87
0G847HB1	Conduct Water Resources Studies	15.8	34.0	25.0	23.2	27.4	31.9	53.7	39.8	19.0	29.8	57.7	72.7	430.00
81919121U2	**Water Resources FY99**	15.8	34.0	25.0	23.2	27.4	31.9	53.7	39.8	19.0	29.8	57.7	72.7	430.00

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0G847HB2 Water Appropriation Hearings	0.0	0.7	0.6	0.0	0.0	0.0	7.3	7.8	15.8	7.4	7.1	7.4	54.11
81919121U3 Water Appropriation Hearings	0.0	0.7	0.6	0.0	0.0	0.0	7.3	7.8	15.8	7.4	7.1	7.4	54.11
0G84XHB3 Tipping Bucket Rain Gage Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	9.0	5.9	0.0	9.7	9.7	-0.9	33.38
81919121U4 Precipitation Gage Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	9.0	5.9	0.0	9.7	9.7	-0.9	33.38
81919121	22.6	42.3	33.5	31.1	34.1	40.7	77.8	62.2	43.8	54.9	82.6	89.7	615.36
AMPP	235.5	307.1	153.1	179.9	183.5	163.8	182.7	253.4	238.6	294.4	280.4	471.1	2,943.55
0GF23HB1 Provide Support/Personnel Services	18.8	22.6	23.1	26.2	22.7	22.0	21.8	17.5	-4.6	21.3	13.1	16.4	220.94
0GF23HB5 Provide Procurement & Property Manag	0.0	0.0	0.0	0.0	5.7	6.7	10.0	13.8	37.0	14.0	15.8	8.5	111.53
0GF23HB6 Provide Computer Support	13.6	25.2	16.1	18.3	39.8	33.0	33.8	28.1	49.6	32.6	40.7	20.4	351.34
81919110U1 Personnel, Procurement, Property S	32.4	47.8	39.2	44.5	68.2	61.8	65.6	59.4	82.0	67.9	69.6	45.3	683.81
0GF23HB2 Provide Facilities Management (space)	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	63.7	65.2	-77.9	638.92
0GF23HB3 Provide Facilities Management (comput	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	92.8	21.6	-18.3	219.15
0GF23HB4 Provide Facilities Management (other)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	9.2	3.2	114.3	149.17
81919110U2 Facilities Management (USGS)	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	165.7	89.9	18.2	1,007.24
0GF3HB1 Provide USGS Training Support	6.1	1.7	4.1	4.8	3.7	6.8	4.6	4.5	5.2	4.7	4.8	5.5	56.50
81919111U1 USGS Training Support	6.1	1.7	4.1	4.8	3.7	6.8	4.6	4.5	5.2	4.7	4.8	5.5	56.50
81919110	120.0	131.0	124.8	130.8	153.4	150.1	151.7	145.4	168.7	238.3	164.3	68.9	1,747.55
0G912HB1 Provide TPO Office Support	14.3	26.9	25.2	27.2	23.6	31.0	38.8	32.3	33.6	30.9	25.9	30.2	340.01
81919135U1 USGS Project Management FY99	14.3	26.9	25.2	27.2	23.6	31.0	38.8	32.3	33.6	30.9	25.9	30.2	340.01
0G922HB1 Conduct Project Control Activities	27.7	22.4	19.7	20.6	18.2	22.0	21.2	19.3	15.8	24.1	28.2	20.8	259.94
81919135U2 USGS Project Control FY99	27.7	22.4	19.7	20.6	18.2	22.0	21.2	19.3	15.8	24.1	28.2	20.8	259.94
81919135	42.0	49.3	44.9	47.8	41.8	53.1	60.0	51.7	49.4	55.0	54.0	51.0	599.95
AMPW	162.1	180.3	169.8	178.6	195.2	203.2	211.7	197.1	218.0	293.3	218.4	119.9	2,347.50
0G33131HB1 Conduct Water-Level Monitoring	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	14.7	23.4	18.4	180.12
81917027U1 Long-Term PC Monitoring FY99	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	14.7	23.4	18.4	180.12
81917027	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	14.7	23.4	18.4	180.12
AMRF	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	14.7	23.4	18.4	180.12

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1.2 OPERATING	919.0	1,017.0	1,166.8	863.7	1,060.1	1,118.0	1,192.6	1,177.2	1,322.2	1,475.3	1,444.7	1,521.2	14,277.89
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	919.0	1,017.0	1,166.8	863.7	1,060.1	1,118.0	1,192.6	1,177.2	1,322.2	1,475.3	1,444.7	1,521.2	14,277.89
FTEs													
FEDERAL	86.0	96.4	99.5	88.5	78.9	92.4	110.1	107.2	107.0	116.2	89.8	99.0	
CONTRACT	29.2	27.4	32.8	26.9	27.5	33.2	36.4	34.7	49.2	40.8	42.5	44.3	
TOTAL	115.2	123.7	132.4	115.4	106.4	125.6	146.4	141.9	156.1	157.0	132.2	143.3	