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Les E. Shephard
Manager, YMP Management Department, MS1333

July 19, 1994

WBS: 1.2.9.2
QA: NA

Mr. Robert M. Nelson, Acting Project Manager
Yucca Mountain Site Characterization
Project Office
U. S. Department of Energy
Nevada Operations Office
Las Vegas, NV 89193-8608

Subject: Monthly Progress Report - June 1994

Dear Bob:

Enclosed is the input from Sandia National Laboratories for the June 1994 Monthly Progress Report. The sections on progress, issues, and deliverables/milestones were telecommunicated to Terri Rodriguez on July 18, 1994. The variance reports were faxed to Ms. Rodriguez also on June 18, 1994.

You may contact Joe Schelling at (702) 794-7575 or David Hampton at (505) 848-0849 if there are any questions.

Sincerely,

for L. E. Shephard

LES:6302:deh
Attachments: As stated.

NH03 1/1
102
WM-11

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L E Shephard

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7/15/94

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SANDIA NATIONAL LABORATORIES

YUCCA MOUNTAIN PROJECT

MONTHLY PROGRESS REPORT

JUNE 1994

DISCLAIMER

Quality assurance checks on data contained or referenced in this report have been performed only to determine that the data have been obtained and documented properly. The SNL Project Department cautions that any information is preliminary and subject to change as further analyses are performed or as an enlarged and perhaps more representative data base is accumulated. These data and interpretations should be used accordingly. Milestones have been baselined and are included to show status.

1.2.3 Site Investigations

Progress During Report Period

Systematic Acquisition of Site-Specific Subsurface Information: Drilling of hole USW SD-9 continues; the total cored depth was 1289 feet on June 24 in rocks belonging to the lower nonlithophysal (sometimes referred to as the mottled) subunit of the Topopah Spring Member. Geologic logging is complete to 963 feet.

Drilling of hole USW SD-12 continues; the total cored depth was 1,044 ft on June 24, within the middle nonlithophysal zone of the Topopah Spring Member, which is essentially the target ESF/repository horizon. The contact with the underlying lower lithophysal zone is anticipated shortly. The plan to suspend drilling of SD-12 in mid-June slightly below the intended depth of the ESF main test level has not yet been implemented, partly because the necessary depth has not yet been reached, but also because the other required use for the drill crew has not materialized. Core recovery deteriorated severely at a depth of approximately 1,000 feet, with several core runs picking up virtually no sample material. Recovery problems are attributed to poor bit selection leading to blocking of the bit face by rock fragments. Core recovery since that time has returned to the 60-70% range. Geologic logging is complete to 957 feet.

The surface location for drill hole USW SD-7 has been staked in the field, and permitting requirements are still being completed. SD-7 is a combined ESF South Ramp/Systematic Drilling Program drill hole located at the approximate location where the Main Test Level drift and South Ramp meet; drilling is scheduled to commence in mid-July.

A draft report, tentatively entitled "Summary Evaluation of Yucca Mountain Surface Transects with Implications for Downhole Sampling," has been completed in anticipation of upcoming SNL Level 3 Milestone 0S88, currently scheduled for completion at the end of July. This report will be a comprehensive review of the various surface transects that have been collected by USGS and SNL staff since about 1990, and it will reevaluate the conclusions of a number of diverse publications (conference papers, abstracts, etc.) with objective of confirming or recommending changes to current downhole sampling patterns for the Project drilling programs. Current indications are that the existing downhole sampling pattern for "framework" hydrologic properties of approximately one sample per meter is completely adequate. Recommendations will be included with respect to how to reduce the sample spacings with least impact on the overall description of spatial variability of properties if budgetary or other logistical constraints indicate the current pattern cannot be maintained throughout the site characterization program. Revisions to the draft document and internal Sandia technical review will be expedited for completion next month.

Measurement of RQD (rock quality designation) values on core from drill holes SD-12 and SD-9 continues to be a problem because this "property" is based upon the piece lengths of recovered core. These data must be obtained prior to on-site core processing to remove

hydrologic samples; thus, the data must be recorded by the TM&SS drilling support (DS) staff. The only alternative is to derive the required information from the pre-core-processing video tapes recorded by the DS geologists. Efforts to obtain these data from TM&SS/DS have been only partially successful. Data transmittals are being received as requested; however, the desired information is "buried" in a great deal of data extraneous to the calculation of RQD. Extracting the necessary information from the remaining material has proved difficult and tedious. Additionally, conversations with staff assigned to the Soil & Rock Properties Study have raised questions regarding the measurements being obtained by the DS group. The source of the presumed discrepancies and the validity of the complaint have not been determined. A subsidiary problem is that RQD as originally defined discounts fractures "induced by coring and handling." Indications are that many extant breaks in the core may be drilling induced; however, this is an interpretation and subject to differences in opinion. Discussions are continuing with both TM&SS/DS and SNL Soil & Rock Properties staff to clarify the nature and extent of the problem and to arrive at a resolution that does not entail unnecessary duplication of effort. In the interim, measures are being taken to maintain consistency of RQD values reported for both the Systematic Drilling Program and the Soil & Rock Properties Study.

Three-Dimensional Rock Characteristics Models: SNL letter report (SLTR94-0003) entitled "Use of Stratigraphy as Soft Information to Constrain Stochastic Modeling of Rock Properties: An Interim Status Report," was completed and transmitted to the Yucca Mountain Site Characterization Office on June 6. This letter report constitutes SNL Level 3 Milestone 0S78. The document presents the theory and mechanics of integrating stratigraphic (geometric) information from the Lynx GMS system as "soft" conditioning data for rock-properties modeling. The concept is to use stratigraphic unit assignments obtained from the 3-D geologic model of the site as a prior estimate of desired material properties that are required for numerical flow-and-transport modeling. This soft information would be incorporated quantitatively into the local conditioning of geostatistical simulations of material properties using the GSLIB algorithms.

SNL letter report (SLTR94-0002) entitled "Two-Dimensional Model of Rock Structural Indices Along the North Ramp," which has summarizes geometric and geostatistical modeling of rock-quality data from the ESF North Ramp drill holes using the Lynx geotechnical modeling system, is being revised to address comments from internal SNL technical review. Production of publication-quality illustrations from Lynx GMS output is proving to be more difficult than anticipated. The document should be revised and submitted to the Project Office during July.

SNL preparation of a letter report summarizing developments by the Stanford Center for Reservoir Forecasting (SCRF), as presented at last month's annual contract review conference, continues. This letter report will be submitted to the Project Office as SNL Level 3 Milestone 0S77 by mid-July.

Sample Characterization: Interim data transmittals of average grain densities for samples

from drillholes UE25 NRG-4, UE25 NRG-5, USW NRG-6 (TDIF #303293), and USW NRG-7/7A (TDIF #303310) were submitted. These transmittals represent partial fulfillment of SNL Level 3 Milestone 0S108. These data will be used for calculating porosities and to examine correlations between porosity and thermal properties.

An interim data transmittal (TDIF #303291) of average grain densities for samples from drillholes USW G-1, USW G-2, USW GU-3 and USW G-4 was submitted. These grain densities are for samples which will be used in the study for determining the heat capacity of different lithologies.

Laboratory Petrologic Determination of Samples from USW NRG-6: Three thin section descriptions remain for samples from NRG-6 above 416.0 feet. All of the whole rock chemical data and X-ray diffraction (XRD) raw data has been collected for these samples.

Fourteen NRG-6 samples below 416.0 feet are undergoing whole-rock chemical analysis. X-ray diffraction (XRD) data was collect for twenty-two samples below 416.0 feet.

Analysis of XRD data is being delayed until procedures for using XPS software and Corel Draw for graphical XRD analysis are completed.

Thermal Conductivity Saturation Study: An interim data transmittal (TDIF #303342) will be submitted in July for thermal conductivity data obtained for this study. This transmittal represents fulfillment of SNL Level 3 Milestone 0S110. Preliminary analysis of the data indicates that there may be a linear relationship between thermal conductivity and saturation level and thermal conductivity and temperature for a given sample. However, the intercept and slope of the linear relationship may vary significantly with the spatial location and sample porosity.

Thermal Conductivity Testing of Samples from USW NRG-6: Holometrix transmitted the thermal conductivity data for samples from NRG-6 to SNL for review. An interim data transmittal and draft report are being prepared.

Multivariate regressing analyses using thermal conductivity, saturation, and matrix porosity data for the NRG-6 samples are being conducted. The results of the analyses will be used in the a study being conducted by SNL to evaluate a range of thermal property representations used in repository-scale modeling, including geostatistical representations of spatial heterogeneity (WBS 1.2.5.4.3 - Repository Performance Assessment).

Determination of Heat Capacity: A new sample holder for use with the adiabatic calorimeter is being fabricated. The new holder is designed to improve the heat transfer and make installation of thermocouples easier.

Samples for XRD and whole rock chemical analysis were delivered to UNM. These data will be used to calculate theoretical heat capacities as described in Nimick and Connolly,

1991 (SAND88-3050). The calculated values will then be compared with measured values to determine if additional testing is required.

Thermal Expansion Sample Size Study: This study is to examine the effects of sample size on thermal-expansion behavior. These experiments are necessary to determine whether the measured thermal expansion has a predictable dependence on the sample size for different lithologies of tuff, and if so, to describe the nature of the relationship. The results of this test will be used to determine the optimum sample size(s) for laboratory thermal expansion tests. Testing was completed in June for this study. An interim data transmittal will be prepared in July.

Thermal Expansion Testing of Samples from USW NRG-6: Thermal expansion curves for samples from USW NRG-6 (28.8 ft. to 1081.5 ft) were submitted via interim data transmittal (TDIF #303285). This transmittal represents partial fulfillment of SNL Level 3 Milestone 0S91.

Laboratory Determination of Mechanical Properties of Intact Rock: In the SNL study of the mechanical properties of NRG drill hole samples at NER, the testing of NRG-7/7A samples from depth range 507-881 feet was completed and the preparation of samples from depth range 898-1451 feet was initiated in June.

Laboratory Determination of Mechanical Properties of Fractures: Seven fractures have been profiled and tested in normal compression and shear experiments. Five samples have been shear tested at 5 MPa normal stress and two at 10 MPa.

Future Regional Climates and Environments: The validation report documenting the validation of the regional climate modeling code, RegCM2 as an acquired code for YMP use, was completed and submitted as a Project record. The success of the validation testing permits the code to be released for use under Project QA controls. An record of a routine calculation analysis for relating the output coordinates of the regional model to localized topography at Yucca Mountain was also completed, a first step in attempting to develop site-scale interpretations of regional scale modeling results. The Study Plan for SCP Study 8.3.1.5.1.6 was approved by the YMSCO late in the month.

Issues and Concerns

Laboratory testing of core samples at the HRF from Systematic Drilling Program drill holes USW SD-12 and SD-9 continues to be a problem because of backlogs from earlier drill holes at the USGS Hydrologic Research Facility (HRF) in Area 25. Testing of SD core is supposed to take place at the HRF under a MOU between the Sandia and USGS PIs. SNL is proceeding with plans to provide additional on-site SNL staff in Nevada to allow more continuous use of available lab equipment.

WBS 1.2.4 Repository

Progress During Report Period

Excavation Investigations and In-Situ Design Verification: Because of the rapid pace in which the experiments will need to be fielded as construction of the North Ramp by the TBM occurs, detailed experiment instructions are being prepared by SNL.

In Situ Thermomechanical Properties: SNL submitted SAND94-0278 entitled "The Yucca Mountain Project ESF Thermomechanical Experiments," which satisfies SNL Level 3 Milestone 0S87.

Certification of Design Methods: On the hybrid boundary element - finite element numerical method activity, SNL is halting all work because funding in the 124 area has been dramatically reduced.

Sealing Design and Design Requirements: Progress during June included continuation of the evaluations of sealing concepts described in existing SAND reports with specific attention being paid to their application for the current ESF/Repository layouts and concepts. An evaluation of repository design/performance constraints for seal systems is underway as related to the current facility design.

A report outlining the strategy for sealing and backfilling the ESF/Repository openings has been drafted. The strategy for sealing attempts to demonstrate isolation of water from all sources entering shafts/ramps or the underground from the waste packages by infiltration and diversion. The report also provides sealing concepts based on the current proposed designs. The YMP sealing strategy is to minimize water contact with the waste package by diversion, enhanced infiltration, and structural stability of the host rock by the use of engineered backfills. This report describes sealing issues such as where to seal, how to seal, and when to seal. Some of these sealing issues may be impacted by the current "in-drift" emplacement concepts being proposed. This impact is largely related to the timing of seal components such as fracture grouting and construction of engineered dams within the emplacement drifts themselves (when necessary). A review team has been organized to provide early input to the report as well as ongoing reviews as the report is prepared. This will assure that the report is of high quality and will permit timely completion of the report.

Sealing Testing:

Progress during June included beginning sample preparation for seal material property testing. These first tests will be on the portland and gypsum based cements outlined in WA-0133 "Laboratory Sealing Tests". In addition, plans have been made to acquire samples of Tsw2 from Fran Ridge for the seal system tests outlined in the WA. These tests can begin in the June-July time frame. Test concepts, including laboratory testing of cementitious plug materials identified in SAND93-1184 continue to be developed. These laboratory tests are

necessary prior to full scale tests so that confidence in material fluid flow and mechanical performance can be developed. Also, proven and demonstrated laboratory test techniques are necessary for evaluation of sealing materials that are used for field demonstrations. Additionally, plans for limited field demonstrations using the seal materials identified for the laboratory testing are being developed. These sealing tests will ultimately be integrated into the performance assessments of Yucca Mountain.

WBS 1.2.5 Regulatory

Progress During Report Period

Develop/Validate Retardation Model for Performance Assessment: Ni adsorption experiments using acid-washed Wedron sand as a substrate have been completed and await Ni analysis. A model of Ni adsorption onto goethite under air-saturated and nominally CO_2-free conditions has been formulated based on analysis of experimental data and HYDRAQL calculations. This model successfully simulates the enhanced adsorption observed under air-saturated conditions in systems with goethite surface areas of 60 m^2/l. At lower surface areas, the model suggests that there are inconsistencies in the CO_2-free experimental data. An abstract entitled, "Carbonate-Enhanced Adsorption of Ni(II) onto Goethite and Sand" (SAND94-1756A) has been prepared for the fall meeting of the Geological Society of America discussing the model.

Conduct Integrated Transport Experiments: A second Li adsorption reversibility experiment was run while samples from the first experiment were re-analyzed, and reinterpreted. Both studies indicate that Li adsorbs irreversibly onto Wedron sand. A review of articles on Li adsorption revealed that one probable substrate in the sand, kaolinite, does irreversibly adsorb Li. Approximately 2/3 of the total adsorbed Li will not desorb, and may reside in octahedral edge sites in the kaolinite structure.

An atmospheric Li-Ni site competition study was conducted. The Ni adsorption curves were shifted relative to the 100 ppb Ni-0 ppm Li atmospheric curve, indicating that Li will displace adsorbed Ni. The effect is small; at expected caisson pH values($\sim$7.2), only about 5% of the adsorbed Ni will be displaced. If the pH is above 7.6 in the caisson, essentially no Ni will be displaced. Also, a 1000 ppm Li/ 100 ppb Ni site competition batch adsorption experiment was initiated.

A short study was conducted to examine methods of stripping adsorbed Ni and Li from Wedron sand, in preparation for the caisson post-mortem.

Preparation for column work and stocking inventory for experiments were completed. The first attempt at re-running LiBr column experiment by a technician new to the column studies was conducted and the samples will be analyzed for Li and Br. Saturation filling and draining curves are being obtained for the 5 cm column in anticipation of running an

unsaturated Ni column experiment.

Flow and Transport Through Single Fractures: Work in this task was concentrated on the field infiltration test underway at Fran Ridge in support of the LLNL Large Block Test. Mapping of fracture data and tracer distribution continued at all three infiltration sites. The original site, located in the SW corner of the excavation surrounding the large block was excavated to approximately 10 feet below the infiltration surface. The infiltration site in the NW corner of the excavation was excavated to approximately 8 feet below the infiltration surface and the site in the NE corner to approximately 6 feet. The NW corner received the smallest volume of fluid (5 gallons), while dye tracer is still visible at the 8 foot depth, the distribution of stain is small and the color is light. At the other two sites, larger volumes of fluid were applied and the stain is distinctly visible over a large areal extent. Local variations in stain intensity at these sites appear to indicate the development of preferential flow paths.

DELIVERABLES COMPLETED THIS MONTH

EVENT	WBS NUMBER	DUE DATE	EXPECTED DATE	COMPLETED DATE	SLIP	DESCRIPTION	COMMENTS
OS78	1.2.3.2.2.2.2	30-MAR-94	06-JUN-94	06-JUN-94	47	Progress Report on Development of Linked Strat-Geo Software	
N/A	1.2.3.2.7.1.1	N/A	N/A	JUN-94	N/A	TDIF 303291, Average Grain Density for Thermal Properties Test Samples from Boreholes USW G-1, USW G-2, USW G-3, & USW G-4.	
N/A	1.2.3.2.7.1.1	N/A	N/A	JUN-94	N/A	TDIF 303293, Average Grain Density for Thermal Properties Test Samples from Boreholes UE25 NRG-4 UE25 NRG-5, & USW NRG-6.	
N/A	1.2.3.2.7.1.1	N/A	N/A	JUN-94	N/A	TDIF 303310, Average Grain Density for Thermal Properties Test Samples from Boreholes UE25 NRG-7.	
N/A	1.2.3.2.7.1.2	N/A	N/A	JUN-94	N/A	TDIF 303285, Thermal Expansion Curves for Samples from USW NRG-6 Drillhole form Depth 28.8 ft. to 1081.5 ft. This data supersedes data previously identified by DTN: SNL01B05059301.002.	
OS87	1.2.4.1.1.2	30-SEP-94	30-JUN-94	30-JUN-94	EARLY	Test Interface SAND Report	
N/A	1.2.5.4.1	N/A	N/A	JUN-94	N/A	SAND93-0852: "The Appropriateness of One-Dimensional Yucca Mountain Hydrologic Calculations."	
N/A	1.2.9.2.2	15-JUN-94	15-JUN-94	15-JUN-94	N/A	Monthly Progress Report, Cost/FTE Report, Variance Reports, etc. - May	

DELIVERABLES PAST DUE

EVENT	WBS NUMBER	DUE DATE	EXPECTED DATE	COMPLETED DATE	SLIP	DESCRIPTION	COMMENTS
OS69	1.2.2.4.3	14-JUN-94	30-SEP-94		75	Report on Backfill Thermal Conductivity Experiment.	
OS82	1.2.3.2.2.2.1	01-JUN-94	31-JAN-95		164	Submit Initial TDIF Data Transfer Report SD-12.	
OS83	1.2.3.2.2.2.1	02-NOV-94	30-JUN-95		163	Submit Final TDIF Drillhole & Data Report SD-12.	
OS84	1.2.3.2.2.2.1	26-SEP-94	30-NOV-94		45	Submit Initial TDIF Data Transfer Report SD-9.	
OS85	1.2.3.2.2.2.1	28-FEB-95	04-MAY-95		47	Submit Final Drillhole & Data Report SD-9.	
OS12	1.2.3.2.6.2.1	02-MAY-94	30-AUG-94		102	SAND Rpt Summary of Data Collection and Analysis for NRG holes.	
OS155	1.2.3.2.6.2.1	18-JAN-94	14-JUL-94		146	Ltr Rpt Summary of Available Drillhole 2C Data.	T. Sullivan requested that data for more than drill hole 2C be included in report
OS156	1.2.3.2.6.2.1	15-JUN-94	19-SEP-94		66	Ltr Rpt Summary of Available Design Package 8B.	T. Sullivan requested that data for more
OS105	1.2.3.2.7.1.3	31-AUG-94	28-APR-94		163	SAND Report for Experiments on Sample SD-12.	
OS116	1.2.3.4.1.5.1	01-APR-94	30-SEP-94		126	SAND Rpt on Verification/Validation of LEHGC 1.0.	
OS23	1.2.4.2.3.2	23-DEC-93	31-JUL-94		148	Ltr. Rpt. Seismic Analysis.	
P654	1.2.5.4.1	23-DEC-93	31-JUL-94		148	Nominal Case Scenario Description.	
OS131	1.2.5.4.1	15-SEP-94	14-SEP-95		249	Rpt on Tectonics Scenario Selection.	
OS132	1.2.5.4.1	15-SEP-94	14-SEP-95		249	Rpt on Human Intrusion Scenario Selection.	
OS05	1.2.5.4.3	23-DEC-93	31-JUL-94		148	Thermal Loading Studies.	
OS153	1.2.5.4.7	30-JUN-94	07-JUL-94		5	Recommendations for Appendix I, ESFDR Based on Sensitivity Analysis.	

DELIVERABLES EXPECTED TO COMPLETE NEXT MONTH

EVENT	WBS NUMBER	DUE DATE	EXPECTED DATE	COMPLETED DATE	SLIP	DESCRIPTION	COMMENTS
OS88	1.2.3.2.2.2.1	31-JUL-94	31-JUL-94		0	Summary Evaluation on Surface Transects/ Down-Hole Sampling.	
OS77	1.2.3.2.2.2.2	15-JUL-94	15-JUL-94		0	Status Report on Advances in Geostatistical Research.	
OS110	1.2.3.2.7.1.1	15-JUL-94	15-JUL-94		0	Report on Saturation Effects on Thermal Conductivity Measurements.	
OS112	1.2.3.2.7.1.1	31-JUL-94	31-JUL-94		0	Report on Thermal Conductivity Data.	
OS89	1.2.3.2.7.1.2	31-JUL-94	31-JUL-94		0	Report on Sample Size Effects on Thermal Expansion.	
OS104	1.2.3.2.7.1.3	31-JUL-94	31-JUL-94		0	Report on Experiment Results on NRG-7 Samples.	
OS101	1.2.3.2.7.1.4	31-JUL-94	31-JUL-94		0	Report on Experiment Data on NRG-7 Samples.	
OS97	1.2.3.6.2.1.6	31-JUL-94	31-JUL-94		0	Report on Preliminary Paleoclimate Validation Analysis.	
OS23	1.2.4.2.3.2	23-DEC-93	31-JUL-94		148	Ltr. Rpt. Seismic Analysis	
P654	1.2.5.4.1	23-DEC-93	31-JUL-94		148	Nominal Case Scenario Description.	
OS05	1.2.5.4.3	23-DEC-93	31-JUL-94		148	Thermal Loading Studies	
OS153	1.2.5.4.7	30-JUN-94	07-JUL-94		5	Recommendations for Appendix I, ESFDR Based on Sensitivity Analysis.	

YMP PLANNING AND CONTROL SYSTEM(PACS)
MONTHLY COST/FTE REPORT
Participant: SNL PERIOD: JUNE 94

WBS ELEMENT (3rd)	ACTUAL COSTS	PARTICIPANT** HOURS	SUBCON. HOURS	PURCHASE COMMITMENTS	SUBCON. COMMITMENTS	ACCRUED* COSTS	APPROVED BUDGET	APPROVED FUNDS	CUMULATIVE COSTS
1.2.1	-24000	102	-528.00	1123.00	14700.93	N/A	182000	164131	85000
1.2.2	1000	0	0.00	0.00	0.00	N/A	50000	49088	51000
1.2.3	281000	2174	1280.00	35398.00	1001293.86	N/A	4779000	4458530	2824000
1.2.4	228000	1290	1056.00	6391.00	207124.08	N/A	2554000	2325897	2328000
1.2.5	381000	2736	1328.00	81354.95	487563.93	N/A	4449000	4316946	3891000
1.2.6	17000	192	-48.00	0.00	784.18	N/A	120000	113939	83000
1.2.9	107000	1020	832.00	2371.58	134336.26	N/A	1400000	1234432	1009000
1.2.11	78000	468	672.00	2096.00	111182.89	N/A	1000000	904110	776000
1.2.12	30000	46	416.00	10037.00	143639.71	N/A	500000	453812	322000
1.2.15	125000	657	1456.00	9155.80	108318.76	N/A	495000	452778	499000
*** Total ***	1224000	8685	6464.00	147927.33	2208944.60		15529000	14473663	11868000

** Participant hours negative due to one-time balance of hours reported with actual SNL Financial System Hours expended

SNL FTEs: 45.0
Contractor FTEs: 40.4

DISCLAIMER:
The Commitment Amounts displayed on this report represent estimates based upon the best available data and should be treated as approximations.

* Note: The SNL Financial system reports Accruals as Actual Costs.

WBS No. - 1.2
WBS Manager -

WBS Title - YUCCA MOUNTAIN PROJECT

Parent WBS No. -
Parent WBS Manager -

Parent WBS Title -

Statement of Work

See the current WBS Dictionary

Cost/Schedule Performance

Id	Description	Current Period BCWS	BCWP	ACWP	SV	CV	FY1994 Cumulative to Date BCWS	BCWP	ACWP	SV	CV	FY1994 at Completion BAC	EAC	VAC
1.2.1	SYSTEMS ENGINEERING	15	15	-24	0	39	141	141	85	0	56	182	182	0
1.2.2	WASTE PACKAGE	0	0	1	0	-1	50	36	51	-14	-15	50	51	-1
1.2.3	SITE INVESTIGATIONS	424	329	281	-95	48	3653	2890	2824	-763	66	4914	4550	364
1.2.4	REPOSITORY	229	237	228	8	9	2187	2211	2328	24	-117	2554	2940	-386
1.2.5	REGULATORY	353	289	381	-64	-92	3464	3231	3891	-233	-660	4449	4766	-317
1.2.6	EXPLORATORY STUDIES FACILI	11	11	17	0	-6	100	100	83	0	17	120	120	0
1.2.9	PROJECT MANAGEMENT	117	117	107	0	10	1057	1057	1009	0	48	1400	1400	0
1.2.11	QUALITY ASSURANCE	82	82	78	0	4	761	761	776	0	-15	1000	1000	0
1.2.12	INFORMATION MANAGEMENT	42	42	30	0	12	381	381	322	0	59	500	448	52
1.2.15	SUPPORT SERVICES	40	40	125	0	-85	382	382	499	0	-117	495	557	-62
Total		1313	1162	1224	-151	-62	12176	11190	11868	-986	-678	15664	16014	-350

Resource Distributions by Element of Cost

Fiscal Year 1994
Budgeted Cost of Work Scheduled

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
LBRHRS	7703	7862	7939	8144	8229	8662	8594	7913	7882	7029	7309	7160	94426
LABOR	639	638	638	643	647	695	708	632	627	498	536	524	7425
SUBS	485	543	588	555	597	580	580	555	556	505	515	496	6555
TRAVEL	0	0	0	0	0	0	0	0	0	0	0	0	0
PM&E	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	154	155	145	141	142	139	124	130	130	91	105	93	1549
CAPITAL	0	0	10	0	0	0	0	0	0	125	0	0	135
Total BCWS	1278	1336	1381	1339	1386	1414	1412	1317	1313	1219	1156	1113	15664

WBS No. - 1.2 -YUCCA MOUNTAIN PROJECT

Resource Distributions by Element of Cost

Fiscal Year 1994
Actual Cost of Work Performed

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
LBRHRS	6341	15060	21603	31781	-33623	9344	7819	7333	8685	0	0	0	74343
LABOR	547	689	754	647	665	772	565	582	644	0	0	0	5865
SUBS	316	272	551	609	736	964	543	387	404	0	0	0	4782
TRAVEL	0	0	0	0	0	0	0	0	0	0	0	0	0
PM&E	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	101	180	169	221	-82	291	119	46	176	0	0	0	1221
CAPITAL	0	0	0	0	0	0	0	0	0	0	0	0	0
Total ACWP	964	1141	1474	1477	1319	2027	1227	1015	1224	0	0	0	11868

Resource Distributions

Fiscal Year 1994	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
BCWS	1278	1336	1381	1339	1386	1414	1412	1317	1313	1219	1156	1113	15664
BCWP	1311	1416	1279	1367	1135	1325	1055	1140	1162	0	0	0	11190
ACWP	964	1141	1474	1477	1319	2027	1227	1015	1224	0	0	0	11868
ETC	0	0	0	0	0	0	0	0	0	1492	1298	1356	4146

Fiscal Year Distribution

	Prior	FY1994	FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	Future	At Complete
BCWS	15134	15664	29631	42435	48185	50224	54404	46938	35109	0	0	0	337724
BCWP	14647	11190	0	0	0	0	0	0	0	0	0	0	
ACWP	13393	11868	0	0	0	0	0	0	0	0	0	0	
ETC	0	4146	29350	41101	48510	55787	55312	48030	25457	1344	0	0	334298

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL PEM: TYNAN WBS: 1.2.3.2.2.2.1

WBS TITLE: SYSTEMATIC ACQUISITION OF SITE-SPECIFIC SUBSURFACE INFO.

P&S ACCOUNT: 0S32221

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
278	22	79	-256	-92.1	7.9	-57	-259.1	27.8	455	263	192	42.2	1637	235.3

Analysis

Cumulative Schedule Variance:

Drilling at SD-12 is proceeding more slowly than anticipated, due in part to repeated blocking of the kelly pipe/hose that conducts cuttings from the rig to the cyclone during the reaming portion of the drilling cycle. An additional issue is the use of only a single crew shift on this hole, thus resulting in significant lost time starting up and shutting down each day.

The late start of SD-9 is also contributing to the behind schedule variance. SD-9 was scheduled to start on March 31, 1994, but did not start until May 17, 1994.

The reduction in crew shifts and the slower than anticipated drilling schedule will push completion of SD-12 from May 1, 1994 to the currently estimated date of January 1, 1994. The delayed start of SD-9 will push its scheduled completion from August 8, 1994 to at least October 8, 1994. These late completion dates will have a significant impact on the completion of Level 2 Milestone T282.

This variance is unrecoverable unless a decision is made to use 3 crew shifts per day, and even then the schedule will only be partially recoverable. An alternative would be to rebaseline the entire Systematic Drilling Program.

Variance at Completion:

This variance is a direct result of being behind schedule. SNL will underrun this effort in FY94 because much of the work has been delayed to FY95.

The forecasted impact is a reduction of $192,000 in the WBS

1.2.3.2.2.2.1 EAC for FY94. The FY95 EAC has been increased to reflect the delay of work into FY95.

This variance is unrecoverable unless a decision is made to use 3 crew shifts per day, and even then the variance will only be partially recoverable. An alternative would be to rebaseline the entire Systematic Drilling Program.

C A Rautman 7/15/94
P&S ACCOUNT MANAGER DATE

R E Thompson FOR L.E.S. 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: TYNAN** **WBS: 1.2.3.2.2.2.2**

WBS TITLE: THREE-DIMENSIONAL ROCK CHARACTERISTICS MODELS

P&S ACCOUNT: 0S32222

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
230	220	271	-10	-4.3	95.7	-51	-23.2	81.2	302	382	-80	-26.5	372	73.9

Analysis

Variance at Completion:

This variance is primarily due to unplanned support required to set up various work stations with Lynx modeling software and other software. Additionally, several new people were added to this effort in FY94. The cost required to bring them up the learning curve was not factored into the planning for WBS 1.2.3.2.2.2.2.

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.3 has been increased.

This overrun cannot be recovered without receiving additional budget to cover the unplanned activities.

C A Kaufman 7/18/94 — P&S ACCOUNT MANAGER — DATE

L E Thompson FOR L.E.S. 7/18/94 — TPO — DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: SULLIVAN** **WBS: 1.2.3.2.6.2.1**

WBS TITLE: SURFACE FACILITIES EXPLORATION PROGRAM

P&S ACCOUNT: 0S32621

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
169	174	263	5	3.0	103.0	-89	-51.1	66.2	220	297	-77	-35.0	332	135.3

Analysis

Variance At Completion:

This variance is due to the following:

1) Unanticipated planning of the characterization program for non-lithified tuffs at Exile Hill (out-of-scope).
2) Unplanned documentation of results of investigations of non-lithified tuffs at Exile Hill (out-of-scope).

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.3. has been increased.

This overrun can only be recovered by increasing the budget to cover the out-of-scope work that was authorized by the PWBS Manager.

P&S ACCOUNT MANAGER DATE

R E Thompson FOR L.E.S 7/18/94
TPO & D.S.K DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: SULLIVAN** **WBS: 1.2.3.2.6.2.3**

WBS TITLE: SURFACE FACIL. FIELD TESTS & CHAR. MEAS.

P&S ACCOUNT: 0S32623

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
320	389	325	69	21.6	121.6	64	16.5	119.7	425	525	-100	-23.5	355	18.0

Analysis

Variance At Completion:

This variance is due to the following:

1) Unplanned trenching on Exile Hill (out-of-scope).
2) Encountering a soil deposit when rock was anticipated.
3) Unplanned rock mass quality for surface outcrops (out-of-scope).
4) Additional surface mapping for the South Ramp (out-of-scope).
5) Unplanned boreholes at 2C and 2D (out-of-scope).
6) Unplanned structural log for UZ14 (out-of-scope).

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.3. has been increased.

This overrun can only be recovered by increasing the budget to cover the out-of-scope work that was authorized by the PWBS Manager.

P&S ACCOUNT MANAGER DATE

R E Thompson FOR L.E.S. 7/18/94
TPO & D.S.K DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: BOYLE** **WBS: 1.2.3.2.7.1.1**

WBS TITLE: LABORATORY THERMAL PROPERTIES

P&S ACCOUNT: 0S32711

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
662	563	490	-99	-15.0	85.0	73	13.0	114.9	880	738	142	16.1	766	127.8

Analysis

Variance At Completion:

This effort will underrun because much of the work will not be completed until FY95. This is due to delayed receipt of samples for testing, samples breaking during the test process, and breakage of test equipment during the test process.

The EAC has been reduced for FY94. The amount of this reduction has been added to FY95.

This variance is unrecoverable.

7-18-94
P&S ACCOUNT MANAGER DATE

R E Thompson FOR L.E.S. 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: BOYLE** **WBS: 1.2.3.2.7.1.2**

WBS TITLE: LABORATORY THERMAL EXPANSION TESTING

P&S ACCOUNT: 0S32712

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
254	223	243	-31	-12.2	87.8	-20	-9.0	91.8	332	393	-61	-18.4	362	72.7

Analysis

Variance At Completion:

This effort will overrun because more effort has been required to process the data than was planned. Doing QA checks, reviewing scientific notebooks, preparing the data disks, and making the data transmittals have all taken more effort than originally anticipated.

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.3 has been increased.

This overrun cannot be recovered without receiving additional budget to cover the greater than anticipated effort to complete this activity.

7-13-94
P&S ACCOUNT MANAGER DATE

R E Thompson FOR L.E.S. 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: BOYLE** **WBS: 1.2.3.2.7.1.3**

WBS TITLE: LAB. DETERMIN. OF MECH. PROP. OF INTACT ROCK

P&S ACCOUNT: 0S32713

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
391	251	321	-140	-35.8	64.2	-70	-27.9	78.2	505	425	80	15.8	646	244.2

Analysis

Cumulative Schedule Variance:

This effort is behind schedule because NRG-7 samples are arriving more slowly than planned and because SD-12 samples have not begun arriving at all due to the delayed Systematic Drilling Program.

Level II Milestones T282, "Ramp/Soil Data", and T036, "Preliminary Design Basis", will be impacted by the delay of SNL Level 3 Milestone 0S105, "Report on Experiment Results on SD-12 Samples", from 9/1/94 to 5/1/95.

This variance is unrecoverable unless a decision is made to use 3 crew shifts per day on SD-12, and even then the schedule will only be partially recoverable. An alternative would be to rebaseline the entire Systematic Drilling Program.

Variance at Completion:

This variance is a direct result of being behind schedule. SNL will underrun this effort in FY94 because much of the work has been delayed to FY95.

The forecasted impact is a reduction of $80,000 in the WBS 1.2.3.2.7.1.3 EAC for FY94. The FY95 EAC has been increased to reflect the delay of work into FY95.

This variance is unrecoverable unless a decision is made to use 3 crew shifts per day on SD-12, and even then the schedule will only be partially recoverable. An alternative would be to rebaseline the entire Systematic Drilling Program.

Laura A Lutz 7/18/94 — P&S ACCOUNT MANAGER — DATE

L E Thompson FOR L.E.S 7/18/94 — TPO — DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL PEM: BOYLE WBS: 1.2.3.2.7.1.4

WBS TITLE: LAB. DETERMINATION OF THE MECH. PROP. OF FRACTURES

P&S ACCOUNT: 0S32714

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
446	346	236	-100	-22.4	77.6	110	31.8	146.6	600	332	268	44.7	409	264.6

Analysis

Cumulative Schedule Variance:

This effort is behind schedule due to a delay in receiving samples. Late drilling, late sample selection, and longer than anticipated sample processing are the primary causes of this delay.

At this time there is no impact to any Level 2 milestones or successor activities.

This underrun is unrecoverable because the additional manpower required to make up for the lost time is unavailable.

Cumulative Cost Variance:

Due to a delay in receiving samples (late drilling, late sample selection, and longer than anticipated sample processing), approximately $178,000 of this effort will not be completed in FY94, resulting in a Cumulative Cost Variance for FY94. In addition, a contract for sample preparation that was planned will not be needed, resulting in a further expected underrun of approximately $90,000.

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.3. has been reduced for FY94 and increased for FY95.

This underrun is unrecoverable because the additional manpower required to make up for the lost time is unavailable.

Variance At Completion:

See the Cumulative Cost Variance above.

Lauren A Lott 7/18/94
P&S ACCOUNT MANAGER DATE

R E Thompson FOR L.E.S. 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: CRAWLEY** **WBS: 1.2.3.6.2.1.6**

WBS TITLE: FUTURE REGIONAL CLIMATE AND ENVIRONMENTS

P&S ACCOUNT: 0S36216

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
423	251	160	-172	-40.7	59.3	91	36.3	156.9	615	608	7	1.1	392	81.3

Analysis

Cumulative Schedule Variance:

A Quality Assurance audit and readiness review directed by YMSCO was anticipated to be completed so that this effort could be resumed on 10/01/93. However, the review was not started until late October and the resumption of the technical work was not authorized until 01/10/94. As a result, this effort is substantially behind schedule.

At this time there is no impact to any Level 2 milestones or successor activities.

Despite being behind schedule at this point in time, this effort is anticipated to be completed as scheduled at no additional cost. The resources are available to complete this effort within the compressed period of performance.

P&S ACCOUNT MANAGER DATE

R E Clayton for L.E.S. 7/18/94
TPO & F.J.S. DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: WHITE** **WBS: 1.2.4.2.1.1.4**

WBS TITLE: IN SITU DESIGN VERIFICATION

P&S ACCOUNT: 0S42114

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
352	352	525	0	0.0	100.0	-173	-49.1	67.0	455	650	-195	-42.9	679	82.4

Analysis

Cumulative Cost Variance:

This variance is primarily due to delaying the Access Convergence Study to FY95. Effort which was to have been completed as part of the Access Convergence Study had to be completed under the In Situ Design Verification. This effort is out-of-scope and unfunded. Another out-of-scope activity that was completed was the instrumentation of the Starter Alcove. Also, certain instrumentation installation that was budgeted for FY93 was delayed by construction and had to be completed in FY94, without any carryover funding.

This work was discontinued in April with the following impacts:

1. Installation of the pressure cells at the end of the starter tunnel to measure initial stress relaxation around the tunnel as the TBM begins excavation cannot be completed.

2. Data reports cannot be completed (Level 3 Milestone 0S75) and scientific notebook records of the instrumentation in the starter tunnel cannot be processed into the records system.

3. Geotechnical support, closure measurements, and other instrumentation that is planned as part of the TBM excavations will not be ready to support the start of TBM operations in August 1994.

4. Level 2 Milestones Z927, Z928, and Z929 cannot be completed without data from the In Situ Design Verification Experiments.

This variance cannot be recovered without additional funding. A letter was sent on 01/19/94 requesting an additional $200,000 of

funding that was removed from the Access Convergence Study on 10/04/93 and placed in Management Reserve. This money was to have been released to SNL pending determination of how much additional funding would be required to complete those efforts necessary to the In Situ Design Verification that were to have been completed as part of the Access Convergence Study.

Variance At Completion:

See the Cumulative Cost Variance above.

7-18-94
P&S ACCOUNT MANAGER DATE

L E Thompson FOR L.E.S 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: WHITE** **WBS: 1.2.4.2.1.2**

WBS TITLE: ROCK MASS ANALYSES

P&S ACCOUNT: 0S4212

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
273	250	105	-23	-8.4	91.6	145	58.0	238.1	252	279	-27	-10.7	106	1.1

Analysis

Cumulative Cost Variance:

This effort is underrunning because charges have not been fully accrued.

Because of this, the cumulative ACWP has been understated.

This accrual problem has been identified and will be corrected in July 1994.

Laura A. Lott 7/18/94
P&S ACCOUNT MANAGER DATE

R E Thompson FOR L.E.S. 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: WHITE** **WBS: 1.2.4.2.3.1**

WBS TITLE: CERTIFICATION OF DESIGN METHODS

P&S ACCOUNT: 0S4231

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
440	426	400	-14	-3.2	96.8	26	6.1	106.5	452	520	-68	-15.0	424	21.7

Analysis

Variance at Completion:

This WBS will overrun because SNL was directed by the Assistant Manager for Engineering and Field Operations to complete the work without receiving the necessary funding. After substantially completing this effort, SNL was informed that no funding was available.

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.4 has been increased.

This overrun cannot be recovered without receiving additional budget to cover the scope of work. However, work on several activities has been terminated to reduce the magnitude of the overrun.

Lauren A Lott 7/18/94
P&S ACCOUNT MANAGER DATE

L E Thompson For L.E.S 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: GIL** **WBS: 1.2.5.1.1**

WBS TITLE: REGULATORY COORDINATION AND PLANNING

P&S ACCOUNT: 0S511

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
152	152	254	0	0.0	100.0	-102	-67.1	59.8	200	310	-110	-55.0	334	85.7

Analysis

Variance At Completion:

This variance is caused by unanticipated effort associated with preparing for and attending the Technical Progress Review (TPR) and planning for Scenario A. Neither of these efforts were budgeted for.

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.5. has been increased.

This overrun is unrecoverable unless the out-of-scope effort, which was authorized by the WBS Manager, is funded.

P&S ACCOUNT MANAGER 7/18/94 DATE

TPO R E Thompson FOR L.E.S 7/18/94 DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: GIL** **WBS: 1.2.5.2.2**

WBS TITLE: SITE CHARACTERIZATION PROGRAM

P&S ACCOUNT: 0S522

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
182	182	89	0	0.0	100.0	93	51.1	204.5	235	162	73	31.1	115	72.6

Analysis

Variance at Completion:

This effort will underrun in FY94 because fewer resources than planned have been requested to support intra- and inter-agency interactions. Also, fewer resources than planned have been needed to support study plans and the Semi-Annual Report.

There is currently no impact to any milestones or deliverables. The EAC for this effort has been reduced.

This variance is unrecoverable unless more support is required for the efforts mentioned above.

P&S ACCOUNT MANAGER 7/18/94 DATE

TPO for L.E.S. 7/18/94 DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL PEM: SMISTAD WBS: 1.2.5.4.1

WBS TITLE: TOTAL SYSTEM PERFORMANCE ASSESSMENT

P&S ACCOUNT: 0S541

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
1060	887	1313	-173	-16.3	83.7	-426	-48.0	67.6	1305	1525	-220	-16.9	1930	197.2

Analysis

Cumulative Schedule Variance:

The "Integrate Long-Term PA Development," "Scenario Selection Documents," and the "NEA FEPS Database Development" efforts are behind schedule because resources were diverted to complete other efforts, such as the TSPA-II report.

SNL Level 3 Milestones 0S131, "Report on Tectonics Scenario Selection ," and 0S132, "Report on Human Intrusion Scenario Selection" have been delayed until the end of FY95. These delays should impact completion of Level 2 Milestone T287.

Sufficient resources are now available to complete the "Integrate Long-Term PA Development" effort for FY94 within the compressed time schedule. However, the other 2 efforts mentioned above will be completed in FY95.

Cumulative Cost Variance:

This variance is due to the greater than anticipated effort to prepare the TSPA-II report for submittal to the DOE. The budget for this report was based on the costs incurred on the TSPA-I report. However, TSPA-II turned out to be more than twice as big as TSPA-I, requiring more effort to write, review, and produce it than planned. Also, much of the computational work for TSPA-II that was scoped and budgeted for in FY93 was actually accomplished in FY94, with no FY93 carryover. Additionally, SNL was required to prepare for and attend several out-of-scope meetings requested by the DOE to present the TSPA-II report's progress. Another factor was 264 hours for the Sandia Expert Panel Review Team, which was unbudgeted.

At this time there is no impact to any Level 2 milestones or

successor activities. However, the EAC for WBS 1.2.5 has been increased.

This overrun is unrecoverable, unless the out-of-scope effort is funded.

Variance At Completion:

See the Cumulative Cost Variance above.

W. George Tufts 7/13/94
P&S ACCOUNT MANAGER DATE

R E Thompson For L.E.S 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: SMISTAD** **WBS: 1.2.5.4.4**

WBS TITLE: SITE PERFORMANCE ASSESSMENT

P&S ACCOUNT: 0S544

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
193	147	199	-46	-23.8	76.2	-52	-35.4	73.9	253	319	-66	-26.1	342	88.3

Analysis

Variance At Completion:

This variance is due to greater than anticipated effort to develop a two-dimensional model for groundwater travel time (GWTT). The unplanned but essential inclusion of outcrop information as well unanticipated problems debugging simulation software have contributed significantly to this variance.

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.5 has been increased.

This overrun cannot be recovered without receiving additional budget to cover the greater than anticipated effort to complete this activity.

W George Gerstner 7/18/94
P&S ACCOUNT MANAGER DATE

R E Thompson for L.E.S. 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: SMISTAD** **WBS: 1.2.5.4.5**

WBS TITLE: INTERACTIVE GRAPHICS INFORMATION SYSTEM

P&S ACCOUNT: 0S545

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
282	282	408	0	0.0	100.0	-126	-44.7	69.1	375	436	-61	-16.3	543	332.1

Analysis

Cumulative Cost Variance:

The level of effort required to maintain adequate computer systems support for SNL is much higher than was anticipated when this effort was planned. Requests for support on UNIX, Novell LAN, and personal computer systems have greatly exceeded what was budgeted. Additionally, establishing SNL-YMP computer network operations at the BDM Bldg. was budgeted for and scoped in FY93 but accomplished in FY94 with no FY93 carryover.

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC for WBS 1.2.5 has been increased.

This overrun is unrecoverable unless the effort associated with FY93 is funded. A CSCR was submitted to YMSCO in May 1994 to request funding for this effort. Efforts are currently underway to determine if any types of support can be eliminated. By doing this, SNL hopes to keep the overrun under $125,000 (the amount that is associated with establishing the SNL-YMP network in FY94).

Variance At Completion:

See the Cumulative Cost Variance above.

P&S ACCOUNT MANAGER 7/18/94 DATE

R E Thompson FOR L.E.S 7/18/94
TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: SMISTAD** **WBS: 1.2.5.4.9**

WBS TITLE: DEVELOP. & VERIFICATION OF FLOW AND TRANSPORT CODES

P&S ACCOUNT: 0S549

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
153	153	140	0	0.0	100.0	13	8.5	109.3	200	150	50	25.0	183	470.0

Analysis

Variance At Completion:

Effort on this task has been reduced in FY94 in order to offset the overrun in WBS 1.2.5 as a whole. However, FY94 objectives will still be met.

At this time there is no impact to any Level 2 milestones or successor activities. However, the EAC of WBS 1.2.5 has been reduced.

This underrun will not be recovered.

W George Curtis 7/18/94 — P&S ACCOUNT MANAGER — DATE

L E Thompson for L.E.S. 7/18/94 — TPO — DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: GANDI** **WBS: 1.2.12.2.2**

WBS TITLE: LOCAL RECORDS CENTER OPERATION (LRC)

P&S ACCOUNT: 0SC22

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
312	312	255	0	0.0	100.0	57	18.3	122.4	410	358	52	12.7	335	95.1

Analysis

Variance at Completion:

$52,000 of WBS 1.2.12.2.2 actuals have been incorrectly charged to WBS 1.2.15.2. The WBS 1.2.12.2.2 EAC has been reduced by $52,000 to offset the corresponding overrun in WBS 1.2.15.2, which cannot be reduced because EAC's cannot be lower than actuals.

At this time there is no impact to any Level 2 milestones or successor activities.

The incorrectly classified charges have been identified and will be moved in July 1994, at which time the EAC will be increased to the budgeted level.

S E Shaupton 7/18/94 R E Thompson FOR L.E.S. 7/18/94

P&S ACCOUNT MANAGER DATE TPO DATE

Yucca Mountain Site Characterization Project
Variance Analysis Report
Status Through: JUNE

PARTICIPANT: SNL **PEM: GANDI** **WBS: 1.2.15.2**

WBS TITLE: ADMINISTRATIVE SUPPORT

P&S ACCOUNT: 0SF2

FY 1994 Cumulative to Date									FY 1994 at Completion					
BCWS	BCWP	ACWP	SV	%	SPI	CV	%	CPI	BAC	EAC	VAC	%	IEAC	TCPI
206	206	311	0	0.0	100.0	-105	-51.0	66.2	265	327	-62	-23.4	400	368.8

Analysis

Cumulative Cost Variance:

$52,000 of WBS 1.2.12.2.2 actuals have been incorrectly charged to WBS 1.2.15.2. The WBS 1.2.15.2 EAC has been increased by $52,000 because EAC's cannot be lower than actuals.

At this time there is no impact to any Level 2 milestones or successor activities.

The incorrectly classified charges have been identified and will be moved in July 1994, at which time the EAC will be reduced by $52,000.

Variance at Completion:

See the Cumulative Cost Variance above.

Allie P. Gonzales 7/18/94
P&S ACCOUNT MANAGER DATE

R E Thompson FOR L.E.S. 7/18/94
TPO DATE