



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

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MEMORANDUM

DATE: June 17, 1987

FOR: Robert E. Browning, Director
Division of High-Level Waste Management

FROM: Paul T. Prestholt, Sr. DR - NNWSI
PJP

SUBJECT: NNWSI Site Report for Months of April, May and June, 1987

1. QUALITY ASSURANCE

This has been a very busy period. I have spent over one month in the last three on QA. There have been three major QA audits of NNWSI participants:

1. DOE Project (WMPD) audit of LANL during the week of March 30, 1987.
2. DOE Project (WMPD) audit of SNL during the week of June 1, 1987.

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Received w/Ltr Dated JUNE 17, 1987
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3. NRC audit of the Min/Pet (Mineralogy/Petrology) group at LANL conducted during the week of June 8, 1987.

A. The DOE NNWSI Project audit of the Los Alamos National Laboratory (LANL) during the week of March 30, 1987, was, in my opinion, the most successful audit conducted by the NNWSI Project to date. There was a good mix of programatic QA and technical personnel which meant that valid value judgements of the technical activities were possible.

The audit was based on the 18 criteria of 10 CFR 50 appendix B and the technical team stayed within those bounds. The technical team looked at the technical procedures, lab notebooks, and reviewed sample collection, tracking and storage and document review. The programatic team looked at the QA program as a whole, and looked specifically at training, certification of personnel, audits, and surveillances and procurement of services and hardware.

One specific goal of this audit was to determine if the Min/Pet group is ready for an invited audit of their activities by the NRC. It was determined that they were indeed ready.

The audit report has been provided to the Operations Branch QA Section.

B. The DOE NNWSI Project audit of the Sandia National Laboratory (SNL) during the week of June 1, 1987, continued the good mix of technical and programatic QA personnel. The agenda for the SNL audit was much the same as for the LANL audit as far as the objectives of the technical and programatic teams was concerned. The emphasis was again on the 18 criteria.

I concentrated on the review of the Site and Engineering Properties Data Base (SEPDB) and the Reference Information Base (RIB) and also performance assessment.

The old Tuff Data Base has been abolished. In its place is the SEPDB. The reason for the Tuff Data Base's demise (as explained by Sandia personnel) is that it was difficult to impossible to get the other participants (LANL, LLNL, USGS, SAIC, etc.) to submit data for inclusion in the data base. As a consequence, the individuals in charge of the data base did the best they could by inputting data from published reports, textbooks, and any other source that seemed appropriate at the time. As a result, inappropriate data has been included and the best fix seems to be to scrap the Tuff Data Base and start over.

The need for someplace to store, for quick retrieval, the scientific and engineering data developed by the NNWSI project is still there. Out of this continuing need the SEPDB was born. However, the same basic problem still exists. How to get the participants to forward the data being developed for inclusion into the SEPDB. At the moment, the SEPDB is primarily a Sandia data base. Much work and education is necessary before it becomes an NNWSI Project data base.

The RIB is a different matter. By definition, the RIB will contain the data to be used in licensing. Much, if not all, of the data in the RIB will come from the SEPDB. At present, however, the RIB is in its infancy and there doesn't seem to be any clear understanding, at least among those working with the RIB, of what data should be included.

Not much was learned about Sandia's performance assessment activities. The individuals responsible for this task were away from the Laboratory and most of the work is being done by contractors. In fact, this was a problem that the audit team faced in most areas. Managers were away working on SCP review so the personnel left for interview were Task Principle

Investigators (P.I.'s). Since the majority of the Lab's work is being done by contractors, it was very difficult for the audit team to see how individual tasks fit into a whole.

This audit did bring to light a potentially serious problem. The Sandia calibration laboratory is used by the NNWSI group at Sandia and by other participants (LANL, REECO, H&N, etc.) for calibration of instruments. The following is a quote from the Standard Deficiency Report (Finding) issued by the audit team:

"Requirement

Sandia National Laboratories NNWSI QAPP Rev. A Paragraph 12.2 required that "all measuring and test equipment calibration will be accomplished using written procedures and will be traceable either to the National Bureau of Standards or to other nationally recognized physical standards."

"Deficiency

Contrary to the above requirement, the Calibration Lab at Sandia does not utilize calibration procedures which are reviewed or approved in accordance with the NNWSI Quality Assurance Program Plan NVO-196-17 Rev 4. Additionally, records indicating traceability to the National Bureau of Standards or other nationally recognized physical standards are not available for review and audit by NNWSI Quality Assurance personnel. Therefore, the calibration status of measuring and testing instruments is indeterminant.

"Recommended Action

1. Review to determine if Sandia has performed Quality Level I or II work with calibrated instruments for which traceability to the National Bureau of Standards or to other nationally recognized physical standards cannot be determined.

2. Provide a corrective plan to resolve the above deficiencies."

The problem is recognized by DOE WMPO and an effort is being made to resolve it.

A copy of the draft Standard Deficiency Reports and Observations issued by the audit team is enclosed.

C. The NRC mini-audit of the LANL Min/Pet program working for the NNWSI was conducted during the week of June 8, 1987. This audit was conducted at the invitation of the DOE-OCRWM-OGR. The audit team consisted of three persons from the QA section of the Operations Branch, Division of High-Level Waste Management; one consultant to the QA section; two persons from the Geochemistry Section, Technical Review Branch of Division of HLWM; one consultant to the Geochemistry Section, and myself. In addition, there were four observers; Carl Johnson, State of Nevada; Carl Newton, DOE Hq.; Jim Blalock, DOE WMPO; and Steve Meta, SAIC, Las Vegas.

The NRC approach to this audit was different from the NNWSI Project approach in two significant ways. First, the three technical members of the team were not tied to the 18 criteria. Instead, they focused on the qualifications and competence of the scientists assigned to the NNWSI Min/Pet program, and, to the extent possible in the time allowed, on the technical program itself. Secondly, the NRC auditors concentrated on licensing needs. The question asked was: Does the QA program supply the type of documentation needed for licensing and is the documented record complete?

The audit team determined that the scientific personnel assigned to the program are well qualified and competent. However, in the programmatic area (the QA program itself) it was determined that there was insufficient documentation of training and certification of personnel, both QA and technical, and that

the LANL internal audit and surveillance program was weak. The final determination was that the LANL Min/Pet program was not qualified for site characterization work.

The above remarks are preliminary in nature. A final report on this audit will be out in July, approximately 30 days after the close of the audit.

The DOE observers expressed two criticisms of the audit. First, the DOE believes the guidance they have received from the NRC in the last three years is, in accordance with the Ford Amendment findings, that the NRC would be looking at "end product" instead of "dotting I's and crossing T's". The DOE observers do not believe that the conduct of this audit reflects this guidance. Second, the definition of a "Finding" changed during the course of the audit to reflect the "Licensability" of documentation.

It was suggested that Appendix 7 meetings be held in the near future to discuss the NNWSI QA program as a whole and the above two criticisms in particular.

Recommendation: That an Appendix 7 meeting be held in Las Vegas, with all participant QA managers attending, to discuss the above problems and attempt to give an accurate picture of NRC expectations and to define for the NNWSI what a qualified QA program consists of.

II. GEOLOGY-HYDROLOGY

On April 23, there was a presentation to the NNWSI Project Manager and the participant TPO's on the hydrogenic deposits (trench 14) found in the region around Yucca Mountain. The Presentation was given by Dr. John Stuckless, USGS, and Dr. Dave Vaniman, LANL. Dr. Stuckless and Dr. Vaniman outlined the current status of the investigation, a suggested approach to solving the problem consisting of a "coordinated

interdisciplinary study", and a discussion on how the results of the investigation will be communicated.

The coordinated approach includes:

1. Field work - drilling, trenching and mapping.
2. Mineralogy - determine the presence or absence of certain diagnostic minerals; compare deposits of known origin; determine the petrogenic history of wall rocks and fault fillings.
3. Geochemistry - compare major and minor element compositions of trench 14 deposits to spring, lake and pedogenic deposits at and near NTS.
4. Fluid inclusions - determine chemistry of depositing fluids in materials of known origin and minerals from trench 14; determine temperatures of precipitation.
5. Geochronology.
6. Tracer isotopes - to determine sources of water-precipitated deposits and hence, paleogroundwater paths.
7. Stable isotopes - to determine the temperature of deposition for hydrogenic deposits; to determine the paleo-isotopic composition of ground water; to look for micro-zonation within hydrogenic deposits.
8. Paleontology - to examine hydrogenic deposits for evidence of biological remains; to compare taxa found with those in near-by modern-day analogues.
9. Hydrology - to determine what 3-dimensional flow models are consistent with constraints developed by other parts of

the study; to develop input for movement of water at repository depth under either saturated or unsaturated conditions.

Results of the above investigations will be communicated in a preliminary workshop and reports followed by a final workshop and publication in open-file format and finally in a professional paper and/or outside journal.

The following schedule is proposed:

- 3/87 -Preparation of scientific research proposal;
- 5/87 - Peer review;
- 2-3 weeks after work approved, sample collecting trip;
- 6-8 months after sample collection, preliminary workshop and results;
- 20-24 months after sample collection, final workshop;
- 2-4 months after final workshop, final written report.

The above is from a handout that is enclosed.

On May 27-29, 1987, the peer review was held in Las Vegas.

The peer review panel consists of five members, as follows:

- Gilbert Hanson, Chairman
Professor, Department of Space and Earth Science,
State University of New York at Stonybrook;
- Peter Hudleston
Professor, Department of Geology,
University of Minnesota;
- Victor Baker
Professor, Department of Geosciences,
University of Arizona;
- Glenn Roquemore
Director, Office of Applied Geosciences
Naval Weapons Center, China Lake, California
- Phillip Bethke
USGS, Reston, Virginia

Charlotte Abrams, Geology and Geophysics Section, Technical Review Branch, and I represented the NRC. In addition, there were a number of individuals representing the State of Nevada present.

The first day, May 27, was spent at Yucca Mountain. Trenches 14 and 17 and the sand ramps on Busted Butte were visited. Presentations were given to the Peer Review at each stop by the USGS and LANL.

The second day, May 28, consisted of presentations by NNWSI participants at the SAIC offices in Las Vegas. USGS and LANL representatives reviewed each organization's proposed research program and Sandia representatives discussed performance assessment.

The third day, May 29, was a wrap-up session in the morning and an afternoon closed session so that the panel could discuss proposed findings and recommendations.

Ms. Abrams is preparing a trip report. A copy of the agenda is enclosed.

An Appendix 7 visit to the USGS geohydrology group at the Federal Center in Denver has been approved for July 8 and 9. Teek Verma and Bill Ford of the Hydrology Section of the Technical Review Branch will accompany me.

III. GEOCHEMISTRY

On April 23, 1987, Dr. G. L. DePoorter gave a presentation to the Project Manager and TPO's on the possible impacts on site characterization experiments of fluids and materials (concrete and grout) used during exploration shaft construction and operation. The technical issues presented are:

What are the deleterious effects of added fluids on:

- o Exploratory shaft experiments on bulk permeability; infiltration and other permeability measurements;
- o Surface based hydrology tests;
- o Waste package performance;
- o Water chemistry changes;
- o Microbiological effects.

Dr. DePoorter went on to outline a proposed resolution strategy. He also presented a summary of accomplishments to date. The handout for this talk is enclosed.

Included in the handout is a chart showing fluid loss in four boreholes at Yucca Mountain:

<u>Hole</u>	<u>Quantity</u> <u>(gallons)</u>	<u>Characteristics</u>
HSWH-3	582,000	Detergent/water 1:60
HSWG-4	322,000	Detergent/water 1:325
USWH-5	712,000	Detergent/water 1:141
USWG-1	2,600,000	Polymer

IV. ROCK MECHANICS, FACILITY DESIGN, EXPLORATORY SHAFT

On April 14, 1987, the DOE-NNWSI held a meeting with the NRC and the State of Nevada to present a proposal to substitute drifting in the exploratory shaft for the long horizontal boreholes that had been planned. The proposed drifts were to be full repository size (25' X 19' and 21" X 14') and would intersect the suspected fault in drill hole wash to the north, the normal faults to the east and the Ghost Dance fault to the west.

Both the NRC and the State of Nevada concurred with comment. The major area of concern to the NRC was the question of whether full size drifts are appropriate or should the drifts be of smaller dimensions. DOE Hq. has the same concern, however

DOE-WMPO expects a go-ahead in the near future so that design work can be started.

V. WASTE PACKAGE

The NNWSI project has established a waste package-repository design interface group. The group consists of 6-10 engineers representing Sandia National Laboratory, Lawrence Livermore National Laboratory, DOE-Waste Management Project Office, and Science Application International Corp.

The following responsibilities have been assigned to the group:

- o Provide formal and scheduled communications between groups;
- o Identify and coordinate systems/design studies in interface areas;
- o Develop mutually compatible design approaches;
- o Recommend initial and revisions to design requirements;
- o Identify and coordinate documentation of interfaces;
- o Recommend interface documentation for NNWSI project baseline;
- o Support WMPO development of project positions in waste package and repository subsystems.

The following existing products exhibit waste package/repository interfacing activities:

- o Site Characterization Plan
 - Section 6.1 repository design bases-waste package
 - Section 7.3 waste package design description-
emplacement hole
 - Section 8.3 performance allocation workshops
- o Conceptual Design Report
 - Section 2.1 waste types and packaging
- o Conceptual Design Cost Estimate
- o Rod Consolidation Study
- o RIB Chapter 2 Design Configurations

Key design interface areas include:

- Waste Package/Repository Design Interfaces
 - Surface waste handling facilities
 - Underground waste emplacement configuration
 - Normal handling/transport loads
 - Postulated accident loads
 - Retrievability
- Waste Package Environment
 - Mechanical loading on container
 - Thermal environment
 - Hydro-geochemical environment
 - Materials compatibility
- Waste Package Process Conditions
 - Welding
 - Inspection
 - Rework

Some key activity interface areas:

- Selection of, and agreement on, design assumptions
- Development of performance criteria
- Definition of accident analysis bases
- Definition of, and changes to, the reference data base
- Development of analytical methods and models
- Preparation of consistent project documentation

A handout is enclosed.

VI. PERFORMANCE ASSESSMENT - PERFORMANCE ALLOCATION

Nothing to report.

VII. ENVIRONMENT

Nothing to report.

VIII. LICENSING AND NRC-DOE INTERACTIONS

A. An Appendix 7 visit to the USGS hydrology group in Denver, Colorado, is planned for July 8 and 9, 1987. Dr. Tilak Verma, Mr. William Ford, and myself, will represent the NRC. I understand that the State of Nevada is planning to send a representative.

B. The Appendix 7 visit to the Lawrence Livermore National Laboratory, originally planned for June 30, July 1, 1987, has been postponed. July 20 and 21 were suggested by DOE Hq. but LLNL has problems with that date. LLNL has counter proposed the week of August 17. No decision has been made at this time.

C. Recommendation

It is suggested that an Appendix 7 visit on QA be planned for the near future (July-August). It is suggested that the visit be to Las Vegas, NV, and that the QA managers from each NNWSI participant be included. It is further suggested that two subjects be included in the agenda:

1. Present an accurate picture of NRC expectations in reviewing a QA program.
2. To define what a "qualified" QA program is.

IX. STATE INTERACTIONS

On May 28, 1987, the annual DOE meeting with the States and Indian Tribes was held in Las Vegas, NV. Mr. Stephen Kale and Mr. Ralph Stein led the DOE contingent while the States and Tribes were represented by the usual group of managers and representatives (R. Loux, State of Nevada; S. Frishman, State of Texas; R. Jim, Yakima Indian Nation; T. Husseman, State of Washington).

The meeting started with a singing telegram to Mr. Kale requesting that DOE go away and leave Nevada alone. This was followed by the presentation of a cake celebrating the one year anniversary of the announcement by DOE of the three sites selected for characterization. The inscription on the cake read, "The Beginning of the End." These high jinks were greeted with applause and laughter.

The two points that were brought out in the meeting that caught my attention, were the promise by Mr. Stein that the NNWSI SCP would be issued on August 21 as planned or very shortly after. The second point was the reluctance expressed by Mr. Kale to consider a six months SCP review period as opposed to the presently planned 90 days. The States and Tribes expressed doubt that a reasonable review of such a large and complex document was possible in 90 days.

The handout from this meeting is enclosed.

X. MISCELLANEOUS

A. Study Plans:

A handout showing the progression of the study plan list over the last three months is enclosed. The latest count shows 106 study plans as follows:

- 5 ea. Exploratory shaft construction phase,
- 33 Ongoing,
- 33 First year,
- 35 Second year and beyond.

The above plans to be released as follows:

- o ES Construction Phase
 - Release with SCP
 - To Hq. for review by 7-3-87
- o Ongoing

- As many as possible with SCP
- As many as possible to Hq. by 7-3-87
- o First Year
 - To extent practicable with SCP
 - To extent practicable to Hq. by 7-3-87

It is my understanding that some study plans have as many as 200 pages.

B. SCP Schedule:

There have been a number of rumors that the NNWSI SCP Schedule might slip as much as six months. The original source was an article in the Las Vegas Sun. The article was supposedly based on a letter to Senator Chic Hecht from Secretary Harrington.

At this time, there is no confirmation from DOE-WMPO that a major schedule slippage is contemplated. According to WMPO, all elements of SCP production are working toward an August 21 issue date. For now, I believe the Division should continue to expect the NNWSI SCP before the end of the fiscal year.

C. On April 9, 1987, four members of the GAO visited my office. They were:

1. Leonard Dowd, Richland, Washington
2. Robert Miller, Richland, Washington
3. Rick Calhoon, Chicago, Illinois
4. Kathleen Turner, Washington, D. C.

In general, the discussion centered around NRC-DOE interactions. The main focus was on whether or not NRC guidance to the DOE was adequate in amount and substance. Apparently there was criticism expressed by some NNWSI personnel that NRC guidance, in some cases, was not specific enough.

cc: With enclosures:

J. J. Linehan
K. Stablein
S. Wastler

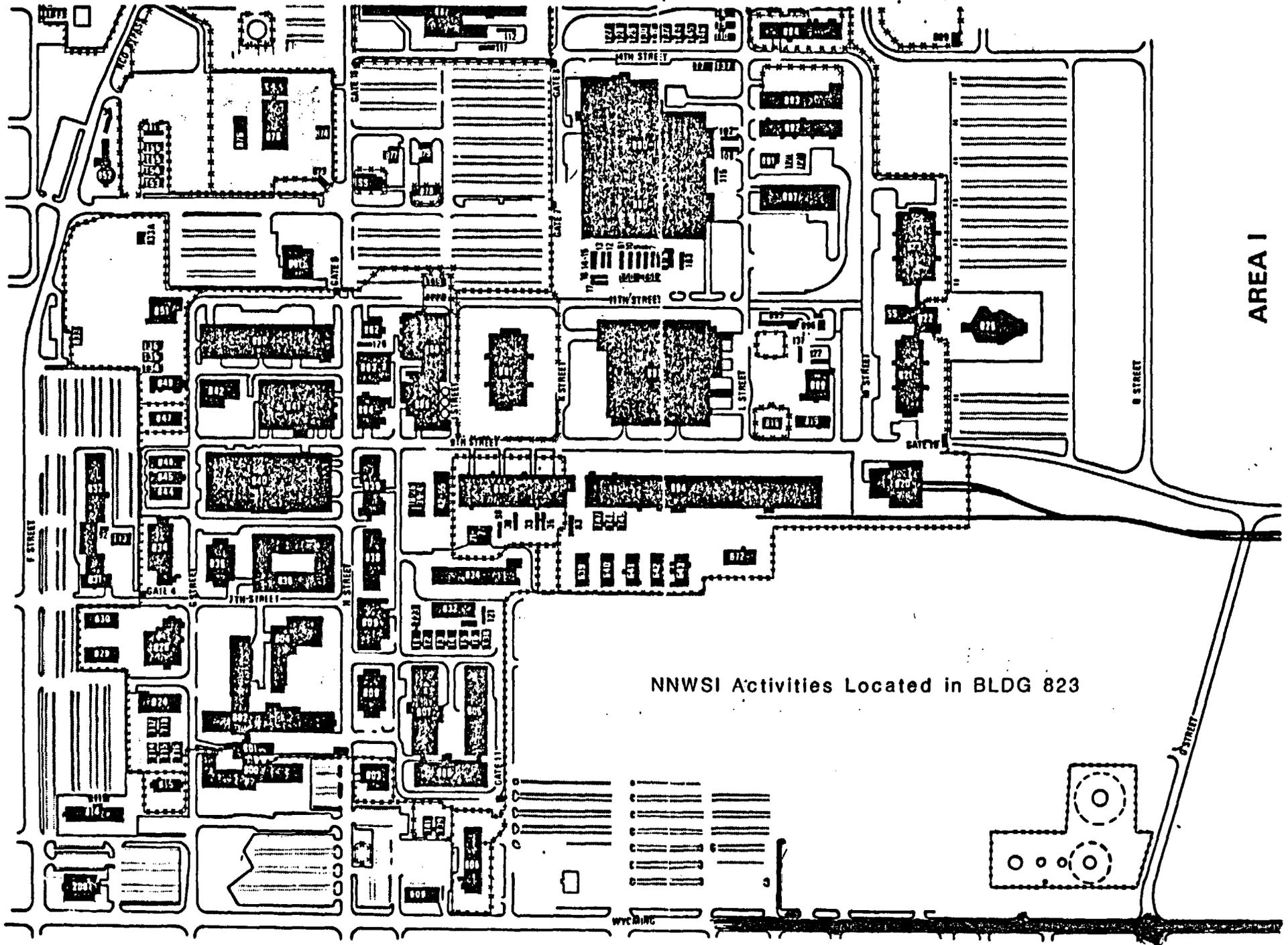
cc: No enclosures:

D. L. Vieth	G. Cook
J. P. Knight	N. Still
R. R. Loux	C. Abrams
J. Szymanski	F. R. Cook
M. Glora	J. K. Goodmiller
D. M. Kunihero	R. Johnson
J. J. K. Daemen	L. Kovach

Enclosures:

Info re: Sandia National Laboratory; Memo re: DOE Meeting with States and Indian Tribes, May 28, 1987, Las Vegas, Nevada; Audit Schedule, Rev. 2; Proposed Master Calendar for DOE Meetings Involving States and Indian Tribes, May 28, 1987 (Draft); Site Characterization Activities and Plans (5/15/87); NRC Draft EA Major Comment; Peer Review on Calcite and Opaline Silica Deposits Located Along Faults Near Yucca Mountain (5/22/87); 5/87 TPO Meeting Handouts; Agenda, TPO Meeting 4/22-23/87; Hydrogenic Deposits (USGS-LANL Presentation, TPO Meeting 4/23/87); What Worked Well, etc., Handout; Calcite, Opaline Silica, and + Sepiolite Deposits External Peer Review, Handout; NNWSI SCP Study Plan Report (4/23/87); Status of Study Plan List, etc., Handout, TPO Meeting 4/23/87; Stop Work Order Status, 4/87; Fluids and Materials in the ESF (TPO Meeting Presentation, Los Alamos, 4/23/87, Gerald L. DePoorter); Review/Acceptance/Approval of NNWSI Project Documents & Revisions Thereto, Handout; Section 8.5 of Site Characterization Plan (From AO), TPO Meeting Handout 4/23/87; PM/TPO SCP Presentation, TPO Meeting Handout 4/23/87; NNWSI Project - Earned Value Implementation Status, April 1987, Handout; Configuration Management, FY 87 Status Report, Handout, TPO Meeting 4/22/87; Status of the Semp (Briefing, 4/87 TPO Meeting by T.O. Hunter, Handout)

Sandia National Laboratory



AREA I

NNWSI Activities Located in BLDG 823

Thomas O. Hunter
Technical Project Officer for NNWSI
Sandia National Laboratories
Organization 6310
P.O. Box 5800
Albuquerque, NM 87185

WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) AUDIT 87-5 OF SANDIA NATIONAL LABORATORIES (SNL) SUPPORT OF THE NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS (NNWSI) PROJECT

Please be advised that a team from the WMPO will conduct a QA audit of the SNL QA Program Plan and quality related activities on June 1-5, 1987. Please arrange a preaudit conference for appropriate personnel at your facility beginning at 10:00 a.m. on June 1, 1987. The postaudit conference is tentatively scheduled for 10:00 a.m. on June 5, 1987.

The team will audit the following areas:

- o QA Program - all sections
- o WBS Elements -
 - 1.2.1.3 Technical Data Base
 - 1.2.1.4 Total Systems Performance Assessment
 - 1.2.3.2.1.1 Site Geology
 - 1.2.4.2.1.1 Rock Mechanics
 - 1.2.4.2.1.2 Field Test
 - 1.2.4.2.1.3 Lab Properties
 - 1.2.4.3 Facilities
 - 1.2.7 Test Facilities (G-Tunnel)

The team will consist of:

Henry H. Caldwell - Lead Auditor, SAIC, Las Vegas, NV
Robert H. Klemens - Auditor, SAIC, Las Vegas, NV
James M. Gromer - Auditor, SAIC, Las Vegas, NV
Gerard Heaney - Auditor, SAIC, Las Vegas, NV
Forrest D. Peters - Auditor, SAIC, Las Vegas, NV
Theodore Vetter - Auditor, SAIC, Las Vegas, NV
George D. Dymmel - Technical Specialist, SAIC, Las Vegas, NV
William R. Sublette - Technical Specialist, SAIC, Las Vegas, NV
U Sun Park - Technical Specialist, SAIC, Las Vegas, NV
Robert W. Clark - Auditor - DOE/HQ (Weston)
Paul T. Prestholt - Observer - NRC/NV

If you have any questions, please call me at FTS 575-1125.

James Blaylock
Project Quality Manager
Waste Management Project Office

WMPO:JB-

cc:

R. R. Loux, State of Nevada
V. J. Cassella, HQ (RW-222) FORS
D. C. Newton, HQ (RW-242) FORS
R. R. Richards, SNL, 6310, Albuquerque, NM
R. M. Baehr, SNL, 6310, Albuquerque, NM
S. H. Klein, SAIC, Las Vegas, NV
W. R. Kazor, SAIC, Las Vegas, NV
R. H. Klemens, SAIC, Las Vegas, NV
H. H. Caldwell, SAIC, Las Vegas, NV
P. T. Prestholt, NRC, Las Vegas, NV
V. F. Witherill, NTSO, NV
A. R. Veloso, NTSO, NV
J. R. Rinaldi, QAD, NV
R. W. Gray, MED, NV
D. L. Vieth, WMPO, NV

WMPO QUALITY ASSURANCE AUDIT PLAN-87-5

1.0 Purpose and Scope

The purpose of this audit is to evaluate the effectiveness of the Sandia National Laboratories (SNL) Quality Assurance Program Plan (QAPP) with respect to the requirements of NNWSI NVO-196-17, Revision 4, and to verify the implementation of the Quality Assurance Program as it relates to the NNWSI Project.

2.0 Organization To Be Audited

Sandia National Laboratories (SNL)

3.0 Audit Schedule

Pre-Audit Team Meeting	1:00 p.m.	5/28/87	Las Vegas, NV
Pre-Audit Conference	10:00 a.m.	6/1/87	Albuquerque, NM
Audit Activities	8:00 a.m.-4:30 p.m.	6/1/87 - 6/5/87	
Albuquerque, NM			
Post-Audit Conference	10:00 a.m.	6/5/87	Albuquerque, NM.

4.0 Requirements To Be Audited

The requirements to be audited are listed in the checklists which were developed from the following documents:

- o NNWSI NVO-196-17, Rev. 4 applicable SOP's
- o SNL QAPP - All Sections
- o Applicable Scientific Investigation Plans for the WBS Numbers identified in Section 5.0 of this plan.

5.0 Activities To Be Audited

The activities to be audited during this audit include:

Programmatic Elements:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Scientific Investigations Control and Design Control
- 4.0 Procurement Document Control
- 5.0 Instructions, Procedures and Drawings
- 6.0 Document Control
- 7.0 Control of Purchased Material, Equipment and Services
- 8.0 Identifications and Control of Samples and Items
- 9.0 Control of Processes
- 10.0 Inspection and Surveillances
- 11.0 Experiment and Equipment Test Control
- 12.0 Control of Measuring and Test Equipment

Activities To Be Audited (cont'd)

- 13.0 Handling, Storage, and Shipping
- 14.0 Inspection and Test Status
- 15.0 Nonconformances
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

WBS Elements:

- 1.2.1.3 Technical Data Base
- 1.2.1.4 Total Systems Performance Assessment
- 1.2.3.2.1.1 Site Geology
- 1.2.4.2.1.1 Rock Mechanics
- 1.2.4.2.1.2 Field Test
- 1.2.4.2.1.3 Lab Properties
- 1.2.4.3 Facilities
- 1.2.7 Test Facilities (G Tunnel)

6.0 Audit Team Members

Henry H. Caldwell	Audit Team Leader	SAIC, Las Vegas, NV
Robert H. Klemens	Auditor	SAIC, Las Vegas, NV
Gerard Heaney	Auditor	SAIC, Las Vegas, NV
James M. Gromer	Auditor	SAIC, Las Vegas, NV
Forrest D. Peters	Auditor	SAIC, Las Vegas, NV
George D. Dymmel	Technical Specialist	SAIC, Las Vegas, NV
Theodore Vetter	Auditor	SAIC, Las Vegas, NV
William R. Sublette	Technical Specialist	SAIC, Las Vegas, NV
U Sun Park	Technical Specialist	SAIC, Las Vegas, NV
Robert W. Clark	Auditor	DOE/HQ (Weston)
Paul T. Prestholt	Observer	NRC/NV

7.0 Audit Checklist Numbers

- 87-5-1 Programmatic
- 87-5-2 Technical

Prepared By: *J. J. Caldwell* Date: MAY 15 1987
SAIC/QASC

Approved By: *W. R. Kaye* Date: 5/15/87
Manager, A&S Branch

Approved By: *James Blaylock* Date: 5/15/87
WMPO/PQM

AUDIT TEAM ASSIGNMENTS

Robert Clark	QAPP 1, 2, and 5
Henry Caldwell	QAPP 6
Jim Gromer	QAPP 8, 9, and 11
Jerry Heaney	QAPP 11, 12, and 14
Bob Klemens	QAPP 4, 7, and 18
Forrest Peters	QAPP 3, 13, and 17
Ted Vetter	QAPP 10, 15, and 16
Jerry Heaney George Dymmel	WBS 1.2.4.3
George Dymmel U Sun Park Forrest Peters	WBS 1.2.1.3, 1.2.1.4
William Sublette/Jim Gromer	WBS 1.2.4.2.1.1, 1.2.4.2.1.3
Henry Caldwell	WBS 1.2.7, 1.2.4.1.3
Forrest Peters/Jerry Heaney	WBS 1.2.3.2.1.1, 1.2.4.2.1.2

CHECKLIST STATUS

AUDIT ITEM NO.	RESP. AUDITOR	RESULTS S X N/A	COMMENTS
1.0-1			
1.0-2			
1.0-3			
1.0-4			
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T. O. Hunter
Technical Project Officer for NNWSI
Sandia National Laboratories
Organization 6310
Post Office Box 5800
Albuquerque, NM 87185

SUSPENSION OF SANDIA NATIONAL LABORATORIES (SNL) WORK ON NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS (NNWSI) PROJECT ACTIVITIES (WMPO ACTION ITEM NO. 86-1400)

The enclosed surveillance report details the results of a Waste Management Project Office (WMPO) Quality Assurance (QA) Surveillance (WMPO/NV-SR-86-024) conducted at Sandia National Laboratory (SNL) on February 25 and 28, 1986. The purpose of the surveillance was to determine the status of the NNWSI Project Work Breakdown Structure (WBS) activities to determine whether Quality Assurance Level Assignments have been proposed by SNL and to determine whether the assignments have been approved by WMPO, as required by NVO-196-17, Revision 3, prior to implementation.

The enclosed report includes one Nonconformance (NCR No. WMPO-11) which identifies that SNL is operating with either unapproved quality assurance level assignments or with no quality assurance level assignments.

Please review the NCR and respond, in accordance with SOP-15-01, within 30 working days after receipt of this letter. In your response, provide the necessary disposition, the action to be taken to preclude recurrence of the nonconformance, and the schedules for completion of the corrective action.

Requests for approvals of Quality Assurance Level Assignment shall be submitted to WMPO with the support package agreed to during the QA Level Assignment Sheet (QALAS) Workshop meetings at Science Applications International Corporation during April 2, 9-10, 1986 using the criteria established during the meeting. The Quality Assurance Level assignments are to be accomplished in accordance with the Interim Change Notice (ICN) for NVO-196-17, Rev. 4, SOP-02-01, and SOP-03-03.

By copy of this letter, you are directed to immediately suspend all SNL work related to NNWSI Project technical activities for which WMPO approval of quality levels has not been obtained with the following exceptions:

1. All administrative work necessary to obtain WMPO approval of quality levels in response to NCR WMPO-11.
2. Planning, both internal and as part of the preparation of the Site Characterization Plan (SCP), the Exploratory Shaft Test Plan (ESTP), the

JUN 10 1986

Environmental Assessment (EA), and the Seismic Tectonic Position Paper (WMP:MBB-579).

3. Administrative/management work, with the exception of procurement of equipment, materials, supplies, and services to be used in technical activities unless such procurement can be shown to be critical to the success of those technical activities allowed to continue. If so, the details, including the quality requirements to be applied, shall be provided to WMPO for concurrence prior to proceeding.

*4. Work for which the suspension would cause an irrecoverable loss of information.

*5. Work in progress on degradable samples or features and laboratory measurements on "natural-state" samples that would degrade if the measurements were interrupted.

6. Preparation and processing of abstracts for meetings if the submission deadline is July 1986 or earlier. These abstracts must be specifically identified and the pertinent information, including manpower resources required, must be provided to the WMPO for evaluation of the impact on resources required to achieve implementation of the Quality Assurance (QA) Program.

7. Prototype testing, experimentation, and other research intended to develop and/or evaluate techniques or procedures provided these activities have been approved by WMPO as Quality Assurance Level III. Continuance of these activities must not prevent adequate manpower resources from being applied to the implementation of the QA Program requirements.

This suspension of work also applies to NNWSI Project related activities currently being performed for SNL by subcontractors unless the work can be clearly exempted as described above.

*Specific activities in these categories or others that SNL strongly believes should be allowed to continue must be identified to WMPO in writing within 10 working days after receipt of this letter. The information to be provided must include the following:

- o Work Breakdown Structure (WBS) task title and numbers
- o Principle Investigator
- o Justification/rationale of why the work must proceed
- o Controls/procedures to be used to assure the data meets QA program requirements

In addition, SNL has not submitted its Quality Assurance Program Plan (QAPP) for NNWSI Project activities to WMPO for review and approval. Review of SNL Quality Assurance Level assignments will not proceed until after WMPO approval of the SNL QAPP which satisfies the requirements found in NVO-196-17, Rev. 4.

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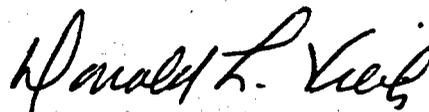
T. O. Hunter

-3-

Achieving the WMPO approval of quality assurance levels on all of the NNWSI Project activities should be given the highest priority, with the exceptions as stated above. SNL personnel assigned to NNWSI Project activities at this time should be redirected to the adequate implementation of NVO-196-17 and SOP-02-02 requirements relative to the assignment and approval of quality assurance levels.

As WMPO approves the quality level of each activity, in writing, the suspension for that activity will automatically be lifted. The NCR will be closed when all of the elements of the WMPO approved corrective actions proposed in the response to the NRC are implemented and verified by WMPO.

Any questions relative to the above are to be addressed to James Blaylock, Project Quality Manager, at FTS 575-1125.



Donald L. Vieth, Director
Waste Management Project Office

WMPO:JB-1062

Enclosure:
As stated

cc w/encl:

V. J. Cassella, DOE/HQ (RW-23), FORS
V. F. Witherill, NTSO, Mercury, NV
A. R. Veloso, NTSO, Mercury, NV
J. R. Rinaldi, QAD, DOE/NV
L. W. Gage, DOE/AL
S. H. Klein, SAIC, Las Vegas, NV
A. E. Cocoros, SAIC, Las Vegas, NV
R. R. Richards, SNL, Albuquerque, NM
M. B. Blanchard, WMPO, DOE/NV
L. P. Skousen, WMPO, DOE/NV
James Blaylock, WMPO, DOE/NV
D. L. Krenz, DOE/AL
J. A. Hood, SNL, Albq., NM
W. J. Purcell, DOE/HQ (RW-20) FORS
J. P. Knight, DOE/HQ (RW-23) FORS
C. L. West, OPA, DOE/NV

QA JUN 11 1986
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SURVEILLANCE REPORT

N-QA-025
6/85

Number WMPO/NV-SR-86-024

Activity A surveillance on the status of WBS activities and Date 2/25 and 2/28/86
verification of QA Level review and approval by WMPO Location SNL, Albuquerque, NM
prior to initiation of these activities.

Reference Documents 1) NVO-196-17, Rev. 3 - Policy, Page VI
2) NNWSI-SOP-02-02, Rev. 0 - Paragraphs 1.0 and 3.1
3) DOE Letter - WMPO:JB-324, 12/31/85; D. L. Vieth to T.O. Hunter
(Enclosure A)

Observations See Enclosure I

Nonconformances See attached NRC # WMPO-11 (Enclosure II)

Report issued By Nancy Voltura/Jim Gromer *[Signature]* Date 4/3/86
Approved By WMPO James Blaylock *[Signature]* Date 5/23/86

Distribution Ref. Transmittal letter WMPO:JB-1062

ENCLOSURE I

1.0 INTRODUCTION

This report contains the results of the Nevada Nuclear Waste Storage Investigations (NNWSI) Project/Waste Management Project Office (WMPO) Surveillance Number WMPO/NV-SR-86-024 performed at Sandia National Laboratories (SNL), Albuquerque, NM on February 25 and 28, 1986.

The surveillance was conducted to obtain the status of the Work Breakdown Structure (WBS) activities and to verify that QA Level Assignments for these activities had been received and approved by WMPO prior to the initiation of these activities. The assignment of QA levels was verified for compliance with NVO-196-17, Rev. 3.

The results of this surveillance must now be evaluated using the criteria established during the QALAS workshop held at SAIC/LV during April 2, 9-10, 1986.

2.0 SURVEILLANCE TEAM PERSONNEL

J. M. Gromer, SAIC/QASC, Las Vegas, NV
N. A. Voltura, SAIC/QASC, Las Vegas, NV

3.0 SUMMARY OF SURVEILLANCE RESULTS

A surveillance was conducted on February 25 and 28, 1986, at Sandia National Laboratories (SNL), Albuquerque, NM. Surveillance activities consisted of discussions and interviews with SNL QA personnel and the respective WBS Task Leaders.

One of the first topics the surveillance team discussed with R. Richards and C. Chocas, SNL/QA, was whether QA Levels had been assigned for each of the WBS items/activities for which SNL is responsible. The surveillance team was informed that although QA levels had been assigned by SNL in September 1985 the subsequent WMPO review did not result in approval. Instead, SNL was directed to review and reevaluate the quality assurance level assignments (ref. DOE letter WMPO:JB-324, 12/31/85, D. L. Vieth to T. O. Hunter, Enclosure (a)).

It must be noted that although SNL did not receive approval of assigned QA levels, work on affected WBS activities has continued. This is in violation of the NVO-196-17, NNWSI Project QA Plan.

It should also be noted that WMPO's review and nonapproval of SNL QA levels did not direct SNL to discontinue its activities, nor did it establish a specific time frame for resubmittal of the Quality Assurance Level Assignments. As a result, several months have elapsed without subsequent action by SNL to resubmit its revised QA Level Assignments even though work in these areas remains ongoing.

Of the WBS activities/items designated as SNL's responsibility, QA Levels were assigned to 34 in September 1985. The remaining items/activities have not been assigned a QA Level since the activity has not been started and the quality assurance level assignment process has not been initiated.

The following is a list of the WBS activities/items by number, description and project personnel contacted:

<u>WBS Number</u>	<u>Description</u>	<u>Project Personnel Contacted</u>
1.2.1.2.1	System Description	J. G. Yeager
1.2.1.2.2	System Studies	C. G. Shirley
1.2.1.2.3	Cost Schedule	
1.2.1.3.1	Tuff Data Base	D. Zeuch
1.2.1.3.2	Computer Graphics	R. Hall
1.2.1.4.1	Flow & Radionuclide Transport	M. S. Tierney
1.2.1.4.2	Radionuclide Source Term	M. S. Tierney
1.2.1.4.4	Radionuclide Releases From	M. S. Tierney
	Total System	
1.2.3.2.1.1	Site Geology	J. T. Neal
1.2.4.2.1.1	Rock Mass Analysis	S. Bauer
1.2.4.2.1.2	Field Test	R. Zimmerman
1.2.4.2.1.3	Laboratory Properties	F. Nimick
1.2.4.2.2.1	Equipment Engineering	R. E. Stinebaugh
1.2.4.2.1.4	Water Migration Analysis	E. Klavetter
1.2.4.2.3.1	Seal Performance Requirements	J. Fernandez
1.2.4.2.3.2	Seal Material Evaluation	J. Fernandez
1.2.4.2.3.3	Seal Concept Development	J. Fernandez
1.2.4.3.1	Site Preparation	C. V. Subramanian
1.2.4.3.2	Surface Facilities	
1.2.4.3.3	Shafts/Ramps (indicated as "complete")	R. E. Stinebaugh
1.2.3.3.4	Underground Excavations	R. E. Stinebaugh
1.2.4.3.5	Underground Surface Systems (indicated as "near completion"; input to waste package canister design is complete - work was for LLNL)	R. E. Stinebaugh
1.2.4.6.1	Performance Code Development & Certification	S. Bauer
1.2.4.6.2	Design Analysis	Task Leader N/A
	Status Presented By	C. Chocas
1.2.4.6.3	Preclosure Safety Analysis	
1.2.4.6.4	Performance Confirmation	A. Stevens
1.2.5.2.1	Regulatory Interface	
1.2.5.2.2	SCP Preparation	A. Stevens
1.2.5.3.1	Environmental Assessment	A. Morales
1.2.9.3	Quality Assurance	
1.2.6.0	ES Decommissioning (Future Activity after ES Test Plan)	R. Zimmerman
1.2.6.1.1	Planning & Design Review (Inactive)	R. Zimmerman
1.2.6.1.2	Safety and QA	R. Zimmerman
1.2.6.9.1	ES Test Plan	R. Zimmerman

1.2.6.9.2	ES Geomechanical Tests	R. Zimmerman
1.2.4.3.2	Surface Facilities	C. Subramanian
1.2.9	Project Management	
1.2.9.1	Project Management and Integration	
1.2.9.1.1	Management	B. Shepard N/A
1.2.9.1.2	Interface Activities	B. Shepard N/A
1.2.9.1.3	Geologic Repository Support	B. Shepard N/A
1.2.9.1.4	NNWSI Project Records Management	M. Tang
1.2.9.2	Project Management	B. Shepard N/A
1.2.9.3	Quality Assurance	R. Richards

N/A = Individual Not Available for discussion.

4.0 SUMMARY OF SURVEILLANCE NONCONFORMANCE REPORT

The surveillance resulted in issuing one (1) Nonconformance Report - NCR No. WMPO-11 (Attachment II). The NCR was written to identify that 100 percent of the WBS activities conducted by SNL do not have WMPO-approved QA levels. Work is continuing on those WBS activities listed in the NCR.

5.0 CORRECTIVE ACTION

A written response to NCR No. WMPO-11 (Attachment II) is required within 30 working days after receipt. Sandia National Laboratories shall review and investigate NCR WMPO-11 to determine the responsible cause(s) and to schedule appropriate corrective action including action to prevent recurrence. The response shall clearly state the responsible cause(s) and corrective action taken to prevent recurrence. In the event that corrective action cannot be completed within 30 days, the SNL response shall include a scheduled date for the corrective action. The SNL shall provide a follow-up report stating the corrective action taken and the date that the corrective action was completed. This response shall be addressed to the Director, WMPO, and a copy shall be sent to the Project Quality Manager, WMPO.



Department of Energy

Nevada Operations Office

P. O. Box 14100

Las Vegas, NV 89114-4100

FILE NO. 10.12.11

JAN 03 1986

Surveillance Report WMPO/NV-SR-86-024
Enclosure A

KEYWORDS: _____

T. O. Hunter
Technical Project Officer
Sandia National Laboratories
P. O. Box 5800
Organization 6310
Albuquerque, NM 87185

DEC 31 1985

REVIEW OF SANDIA NATIONAL LABORATORIES (SNL) QUALITY ASSURANCE LEVEL ASSIGNMENT SHEETS

On November 13, 1985, SNL and the Waste Management Project Office (WMPO) Quality Assurance (QA) personnel met to discuss the QA Level Assignment Sheets submitted by SNL on 9/31/85. As a result of the discussion, it was decided that the WMPO would take no action for approval of the assignments at this time, and would return them to SNL for further evaluation of the level assignments and QA criteria applied (Enclosure 1).

The major problem with the QA level assignments was the selection of QA Level II or III for several activities which will provide information for design inputs and performance objectives of the repository. It is apparent that the SNL approach was to assign QA Level II to activities associated with Advanced Conceptual Design (ACD) and QA Level I at a point in time when the activity becomes Licensing Conceptual Design (LCD). In assigning QA levels we must keep in mind that the information developed during the ACD phase will provide the design and performance objective inputs for LCD, therefore rendering them QA Level I activities. The Nuclear Regulatory Commission (NRC) position on design inputs is clearly stated on page 5 (NNWSI Project question and NRC answer #5) of Enclosure 2.

Other problems are as follows: The descriptions of the activities are too brief to make an evaluation of the appropriate QA level (reference System Description, WBS 1.2.1.2.1, as compared to the WBS Dictionary description). Several of the sheets were written in pencil or are not clearly legible, making them unacceptable as QA records. QA criteria are missing or only implied, and some apparently inappropriate criteria were selected for some activities (e.g. "Inspection" designated for studies).

The WMPO would appreciate your reevaluation of the QA level assignments in accordance with the information provided during the November 13 meeting and resubmittal for review and approval as soon as possible.

C JAN 3 1986

T. O. Hunter

- 2 -

DEC 31 1985

Please contact James Blaylock if you have any questions regarding this letter.

WMPO:JB-324

Enclosure:
As stated

cc w/o encl.:

V. J. Cassella, DOE/HQ (RW 22) FORSTL
R. R. Richards, SNL, Albuquerque, NM
S. H. Klein, SAIC, Las Vegas, NV

James S. Bayne
Donald L. Vieth, Director
Waste Management Project Office



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NONCONFORMANCE REPORT

Enclosure II SR # WMP0/NV-SR-86-024

N-QA-009
1/85

PART I - INITIATION

Originator/Organization Nancy Voltura/Jim Gromer/SAIC-QASC

Assigned Quality Assurance Level _____ NCR No. WMP0-11 NCR Date 3/20/86

Nonconforming Item or Activity and Responsible Organization WBS Activities/QA Level

Assignments - Sandia National Laboratories

Specification/Drawing/Procedure Requirements See attached

Deficiency All (100%) of the WBS activities being conducted by SNL do not have WMP0 approved QA Levels as required by NVO-196-17, Rev. 3. Work is continuing in (cont'd)

PART II - PERSON/ORGANIZATION ASSIGNED DISPOSITION RESPONSIBILITY

PART III - DISPOSITION Repair Rework Use-as-is Reject/Scrap

Describe Technical Justification and Assignment of Responsibility _____

Approvals of Disposition

Dispositioner/Date _____ Dispositioner/Date _____

Project QA/Date _____ WMP0/NTSO/Date _____

Disposition Action Complete Date _____

PART IV - VERIFICATION (Approved Disposition Verified and Examined)

Accept Reject New NCR No. _____ Project QA/Date _____

Comments _____

Specification/Drawing/Procedure Requirements (continued)

1) NVO-196-17, Rev. 3 - Policy, Page VI states in part:

"... In order to establish the quality assurance level of the various Project activities, each NNWSI Project Participating Organization shall generate a Quality Assurance Procedure which will define the method of controlling and documenting the level of quality to be applied to the NNWSI Project tasks, or parts thereof, for which they are responsible. The procedure shall include methods for change control of assigned quality levels, and requirements for documentation of the following as a minimum:

- o Persons or organizational unit responsible for determining the quality assurance level.
- o Criteria for determining level of quality assurance to be applied.
- o Technical justification for the quality assurance level selected.
- o Person(s) or organizational unit providing an independent review and approval of the assigned quality assurance level.
- o The quality assurance level selected for application to the respective activities, and which of the criteria (18 point criteria) will be applicable.

The document designating the above shall be sent to WMPO for approval prior to the start of the activity. During the WMPO review and approval of the document indicating the applicable quality level, WMPO may direct that the Participating Organization change the quality assurance level of the activity."

2) NNWSI-SOP-02-02, Rev. 0 - Page 2 of 13 states in part:

"The purpose of this procedure is to define the responsibility and method for assigning and documenting Quality Assurance (QA) levels to the activities or items involved in the Nevada Nuclear Waste Storage Investigations (NNWSI) Project. The method described in this procedure is intended to ensure that (a) all the NNWSI Project activities or items are evaluated for QA level assignment ... (b) "QA levels are assigned correctly and uniformly throughout the NNWSI Project, (c) QA criteria are applied in assigning QA levels, and (d) the justification for the assignment of QA levels is documented.

3.0 Definitions - "3.1 Activity - any effort (operation, task, function, or service) that affects the achievement or verification of the objectives stated in the WBS Dictionary."

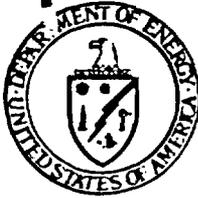
Deficiency (continued)

The following areas without WMPO approval:

<u>WBS Number</u>	<u>Description</u>	<u>Project Personnel Contacted</u>
1.2.1.2.1	System Description	J. G. Yeager
1.2.1.2.2	System Studies	C. G. Shirley
1.2.1.2.3	Cost Schedule	
1.2.1.3.1	Tuff Data Base	D. Zeuch
1.2.1.3.2	Computer Graphics	R. Hall
1.2.1.4.1	Flow & Radionuclide Transport	M. S. Tierney
1.2.1.4.2	Radionuclide Source Term	M. S. Tierney
1.2.1.4.4	Radionuclide Releases From Total System	M. S. Tierney
1.2.3.2.1.1	Site Geology	J. T. Neal
1.2.4.2.1.1	Rock Mass Analysis	S. Bauer
1.2.4.2.1.2	Field Test	R. Zimmerman
1.2.4.2.1.3	Laboratory Properties	F. Nimick
1.2.4.2.2.1	Equipment Engineering	R. E. Stinebaugh
1.2.4.2.1.4	Water Migration Analysis	E. Klavetter
1.2.4.2.3.1	Seal Performance Requirements	J. Fernandez
1.2.4.2.3.2	Seal Material Evaluation	J. Fernandez
1.2.4.2.3.3	Seal Concept Development	J. Fernandez
1.2.4.3.1	Site Preparation	C. V. Subramanian
1.2.4.3.2	Surface Facilities	
1.2.4.3.3	Shafts/Ramps (indicated as "complete")	R. E. Stinebaugh
1.2.3.3.4	Underground Excavations	R. E. Stinebaugh
1.2.4.3.5	Underground Surface Systems (indicated as "near completion"; input to waste package canister design is complete - work was for LLNL)	R. E. Stinebaugh
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1.2.4.6.2	Design Analysis Status Presented By	Task Leader N/A C. Chocas
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1.2.4.6.4	Performance Confirmation	A. Stevens
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1.2.5.2.2	SCP Preparation	A. Stevens
1.2.5.3.1	Environmental Assessment	A. Morales
1.2.9.3	Quality Assurance	
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1.2.6.9.1	ES Test Plan	R. Zimmerman
1.2.6.9.2	ES Geomechanical Tests	R. Zimmerman
1.2.4.3.2	Surface Facilities	C. Subramanian
1.2.9	Project Management	
1.2.9.1	Project Management and Integration	

1.2.9.1.1	Management	B. Shepard	N/A
1.2.9.1.2	Interface Activities	B. Shepard	N/A
1.2.9.1.3	Geologic Repository Support	B. Shepard	N/A
1.2.9.1.4	NNWSI Records Management	M. Tang	
1.2.9.2	Project Management	B. Shepard	N/A
1.2.9.3	Quality Assurance	R. Richards	

N/A = Individual Not Available for discussion.



Department of Energy

Nevada Operations Office

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Las Vegas, NV 89114-4100

MAY 21 1987

Thomas O. Hunter
Technical Project Officer for NNWSI
Sandia National Laboratories
Organization 6310
P.O. Box 5800
Albuquerque, NM 87185

WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) AUDIT 87-5 OF SANDIA NATIONAL LABORATORIES (SNL) SUPPORT OF THE NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS (NNWSI) PROJECT

Please be advised that a team from the WMPO will conduct a QA audit of the SNL QA Program Plan and quality related activities on June 1-5, 1987. Please arrange a preaudit conference for appropriate personnel at your facility beginning at 10 a.m. on June 1, 1987. The postaudit conference is tentatively scheduled for 10 a.m. on June 5, 1987.

The team will audit the following areas:

- o QA Program - all sections
- o WBS Elements -
 - 1.2.1.3 Technical Data Base
 - 1.2.1.4 Total Systems Performance Assessment
 - 1.2.3.2.1.1 Site Geology
 - 1.2.4.2.1.1 Rock Mechanics
 - 1.2.4.2.1.2 Field Test
 - 1.2.4.2.1.3 Lab Properties
 - 1.2.4.3 Facilities
 - 1.2.7 Test Facilities (G-Tunnel)

The team will consist of:

Henry H. Caldwell - Lead Auditor, SAIC, Las Vegas, NV
Robert H. Klemens - Auditor, SAIC, Las Vegas, NV
James M. Gromer - Auditor, SAIC, Las Vegas, NV
Gerard Heaney - Auditor, SAIC, Las Vegas, NV
Forrest D. Peters - Auditor, SAIC, Las Vegas, NV
Theodore Vetter - Auditor, SAIC, Las Vegas, NV
George D. Dymmel - Technical Specialist, SAIC, Las Vegas, NV
William R. Sublette - Technical Specialist, SAIC, Las Vegas, NV
U Sun Park - Technical Specialist, SAIC, Las Vegas, NV
Robert W. Clark - Auditor - DOE/HQ (Weston)
Paul T. Prestholt - Observer - NRC/NV

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization in Block 5

1 Date June 3, 1987	2 Severity Level 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 1
3 Discovered During WMPO Audit 87-5	3a Identified By R. Klemens	3b Branch Chief Concurrence Date	4 SDR No. A Rev. 0
5 Organization SNL	6 Person(s) Contacted D. Brockman, R. Richards		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) Checklist 87-5-1, Audit Team No. 4.0-4 QAPP Rev. 0, Section 4.1.3 DOP 4-2 "Changes to Procurement Documents" has not been issued			
9 Deficiency SNL has no written procedures covering "Changes to Procurement Documents." All changes to Procurement Documents, including negotiated changes, should be included in DOP 4-2.			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective Write and issue procedure DOP 4-2 to include how all changes to Procurement Documents are handled by SNL for the NNWSI Project			
11 QAE/Lead Auditor Date	12 Branch Manager Date	13 Project Quality Mgr. Date	
14 Remedial/Investigative Action(s)			
			15 Effective Date _____
DRAFT 6-5-87			
16 Cause of the Condition & Corrective Action to Prevent Recurrence			
			17 Effective Date _____
18 Signature/Date			
19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input type="checkbox"/> Amended <input type="checkbox"/> Response	QAE/Lead Auditor/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject		Branch Manager/Date
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

33 and
 Completed by Originating QA Organization
 Completed by Organization in Block 5
 Comp. by Orig. QA Org.

1 Date June 4, 1987	2 Severity Level <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During WMPO Audit 87-5-2	3a Identified By George Dymmel	3b Branch Chief Concurrence Date	4 SDR No. <u>B</u> Rev. <u>0</u>
5 Organization SNL	6 Person(s) Contacted R. E. Stinebaugh		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) Audit Checklist No. T-8 Reference WBS 1.2.4.3			
9 Deficiency WBS 1.2.4.3 QALS approved at Level II. Task No. 1.2 approved under DIM 102, 2/19/87, "Emplacement Orientation" was designated as QALS III.			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective See Page 2			
11 QAE/Lead Auditor Date	12 Branch Manager	Date	13 Project Quality Mgr. Date
14 Remedial/Investigative Action(s)			
			15 Effective Date _____
DRAFT 6-5-87			
16 Cause of the Condition & Corrective Action to Prevent Recurrence			
			17 Effective Date _____
18 Signature/Date			
19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input type="checkbox"/> Amended Response	QAE/Lead Auditor/Date
			Branch Manager/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date	
			Branch Manager/Date
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date	
			Branch Manager/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date



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B

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Recommended Actions

1. Review all DIMS issued and determine if QA level is consistent with level assigned to related WBS or Modified Work Plan.
2. Revise DIM 102 under Approved Procedures to the required QALS II.
3. SNL to verify with subcontractor that work will be completed to QA Level II as specified by revised DIM 102.

WMPO STANDARD DEFICIENCY REPORT

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Completed by Originating QA Organization

1 Date June 3, 1987	2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3			Page 1 of 2
3 Discovered During WMPO Audit 87-5	3a Identified By G. Dymmel G. Heaney	3b Branch Chief Concurrence Date N/A	4 SDR No. <u>C</u> Rev. <u>0</u>	
5 Organization SNL	6 Person(s) Contacted B. Stinebaugh, R. Hill, C. Subramanian		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) See Page 2				
9 Deficiency See Page 2				
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective See Page 2				
11 QAE/Lead Auditor Date	12 Branch Manager	Date	13 Project Quality Mgr. Date	
14 Remedial/Investigative Action(s)				
<p style="font-size: 2em; margin: 0;">DRAFT</p> <p style="font-size: 1.5em; margin: 0;">6-5-87</p>			15 Effective Date _____	
16 Cause of the Condition & Corrective Action to Prevent Recurrence				
				17 Effective Date _____
18 Signature/Date				
19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input type="checkbox"/> Amended Response	QAE/Lead Auditor/Date	Branch Manager/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date	Branch Manager/Date
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date	Branch Manager/Date
22 Remarks				
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date	

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Requirement

Sandia National Laboratories NNWSI Quality Assurance Program Plan Rev. A Paragraph 5.1.2 states in part "Detailed technical documents will be developed and contain instructions for the actual performance of activities that include but are not limited to design, testing, experiments, and analysis. (Refer to Audit Checklist Item No. T-4).

Deficiency

Contrary to the above requirement, Sandia Department Operating Procedures (DOPs) DOP 3-6 "Design Change Control" and DOP 3-9 "Interface Control of NNWSI Engineering Design" do not make reference to the NNWSI Standard Operations Procedure SOP-03-05 "ESF Project Interface Control Procedure." The DOPs do not address the processing and approvals within Sandia of ESF Engineering Change Requests which are generated in accordance with SOP-03-05.

The SOP-03-05 is a procedure used by the Exploratory Shaft Facility Project group to establish and implement interface control of ESF design changes between NNWSI Project participants. Sandia would be sent ESF Engineering Change Requests for evaluation and review for impact on Sandia surface and subsurface designs.

Recommended Actions

1. Revise DOPs 3-6 and 3-9 to reference and include the processing of SOP-03-05 generated documents.
2. Reinstruct appropriate personnel to the revised procedures.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

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 Comp. by Orig. QA Org.

1 Date <u>June 4, 1987</u>	2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 1
3 Discovered During WMPO Audit 87-5	3c Identified By R. H. Klemens	3b Branch Chief Concurrence Date	4 SDR No. <u>0</u> Rev. _____
5 Organization SNL	6 Person(s) Contacted R. Richards, R. Prindle, D. Brockman		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) DOP-02-01, Rev. 1 SNL QAPP Audit Item No. 7.0-2			
9 Deficiency SNL does not have a procedure covering the evaluation for acceptance of purchased items and services. DOP 7-2 has not been issued.			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective Develop and issue a procedure covering SOP-02-01, Rev. 1 - Requirements for Evaluation for Acceptance of Purchased Items and Services.			
11 QAE/Lead Auditor Date	12 Branch Manager	Date	13 Project Quality Mgr. Date
14 Remedial/Investigative Action(s)			15 Effective Date _____
<div style="font-size: 2em; font-family: cursive;">DRAFT 6-5-87</div>			
16 Cause of the Condition & Corrective Action to Prevent Recurrence			17 Effective Date _____
18 Signature/Date			
19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input type="checkbox"/> Amended Response	QAE/Lead Auditor/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject		Branch Manager/Date
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date

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 Completed by Originating QA Organization
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 Completed by Organization in Block 5
 Comp. by Orig. QA Org.

1 Date <u>June 4, 1987</u>	2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 1
3 Discovered During WMPO Audit 87-5	3a Identified By R. H. Klemens	3b Branch Chief Concurrence Date	4 SDR No. <u>E</u> Rev. <u>0</u>
5 Organization SNL	6 Person(s) Contacted R. Richards		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) SNL QAPP, SOP-02-01, Rev. 1 - Appendix D Audit Item No. D-1			
9 Deficiency SNL does not have a procedure which covers the requirements for certification, qualification, and training of auditors and lead auditors to SOP-02-01, Rev. 1 - Appendix C.			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input type="checkbox"/> Corrective Develop and issue a procedure covering SOP-02-01, Rev. 1 - Appendix D requirements for the certification, qualification, and training of auditors.			
11 QAE/Lead Auditor Date	12 Branch Manager Date	13 Project Quality Mgr. Date	
14 Remedial/Investigative Action(s)			15 Effective Date _____
<div style="font-size: 2em; font-family: cursive;">DRAFT 6-5-87</div>			
16 Cause of the Condition & Corrective Action to Prevent Recurrence			17 Effective Date _____
18 Signature/Date			
19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Amended Response <input type="checkbox"/> Reject	QAE/Lead Auditor/Date	Branch Manager/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date	Branch Manager/Date
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date	Branch Manager/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date

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3/87

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Comp. by Orig. QA Org.

1 Date June 3, 1987	2 Severity Level <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 1
3 Discovered During WMPO Audit 87-5-1	3a Identified By T. Vetter	3b Branch Chief Concurrence Date N/A	4 SDR No. <u>F</u> Rev. _____
5 Organization SNL	6 Person(s) Contacted Project Quality Coordinator for SNL		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) From the Audit checklist 10.0-2 and related areas 15.0-1, implementing procedures are required for surveillances, nonconformances, and corrective actions.			
9 Deficiency The procedures identified have not been approved and implemented, although quality level activities affected by these systems are in progress.			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective Complete and implement the procedures on surveillances, nonconformances, and corrective actions.			
11 QAE/Lead Auditor Date	12 Branch Manager Date	13 Project Quality Mgr. Date	
14 Remedial/Investigative Action(s)			15 Effective Date _____
<div style="font-size: 2em; font-family: cursive;">DRAFT</div> <div style="font-size: 1.5em; font-family: cursive;">6-5-87</div>			
16 Cause of the Condition & Corrective Action to Prevent Recurrence			17 Effective Date _____
18 Signature/Date			
19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input type="checkbox"/> Amended Response	QAE/Lead Auditor/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject		Branch Manager/Date
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date

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3/87

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Completed by Originating QA Organization
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Completed by Organization in Block 5
Comp. by Orig. QA Org.

1 Date June 4, 1987	2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3		Page 1 of 2
3 Discovered During WMPO Audit 87-5	3a Identified By R. W. Clark	3b Branch Chief Concurrence Date	4 SDR No. <u>6</u> Rev. <u>0</u>
5 Organization SNL	6 Person(s) Contacted R. R. Richards		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) SOP-02-01 Rev. 1, Section 17.0; 17.2.2 SNL QAPP Section 2.1.5 Audit Checklist No. 87-5-1, Audit Item No. 17.0-2			
9 Deficiency See Page 2			
10 Recommended Action(s): <input type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective			
11 QAE/Lead Auditor Date	12 Branch Manager Date	13 Project Quality Mgr. Date	
14 Remedial/Investigative Action(s) <div style="text-align: center; font-size: 2em; font-family: cursive;">DRAFT 6-5-87</div>			
15 Effective Date _____			
16 Cause of the Condition & Corrective Action to Prevent Recurrence			
17 Effective Date _____			
18 Signature/Date			
19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input type="checkbox"/> Amended Response	QAE/Lead Auditor/Date
		Branch Manager/Date	
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date	
		Branch Manager/Date	
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date	
		Branch Manager/Date	
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date



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Deficiency

SOP-02-01 Rev. 1 requires that QA records be reproducible and microfilmable.

SNL QAPP SLTR86-0001 Rev. A requires, as part of Receipt Inspection of Records, that Records be completed in black ink.

Review of all existing indoctrination and training records, "Familiarization Programs Document" and Form QAP 2-5(1), revealed that a number of these documents had entries in pencil, as well as entries in multi-colored ink, i.e., red, green, blue.

WMPO STANDARD DEFICIENCY REPORT

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 Completed by Originating QA Organization
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 Comp. by Orig. QA Org.

1 Date June 3, 1987	2 Severity Level <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During WMPO Audit 87-5	3c Identified By T. Vetter	3b Branch Chief Concurrence Date N/A	4 SDR No. <u>H</u> Rev. _____
5 Organization SNL	6 Person(s) Contacted Project Quality Coordinator for SNL		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) From the Audit Checklist 10.0-2 and related areas 15.0-1 and 16.0-1, implementing procedures are required for surveillances, nonconformances, and corrective actions.			
9 Deficiency See Page 2			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective Complete and implement the procedures on surveillances, nonconformances, and corrective actions.			
11 QAE/Lead Auditor Date	12 Branch Manager Date	13 Project Quality Mgr. Date	
14 Remedial/Investigative Action(s)			15 Effective Date _____
DRAFT 6-5-87			
16 Cause of the Condition & Corrective Action to Prevent Recurrence			17 Effective Date _____
18 Signature/Date			
19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input type="checkbox"/> Amended Response	QAE/Lead Auditor/Date
			Branch Manager/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date
			Branch Manager/Date
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date
			Branch Manager/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date



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Deficiency

Quality Level I and II activities are currently being implemented within the WBS elements and purchasing activities. To assure compliance with the quality program, surveillances are required to be performed in accordance with written procedures. In the event that reportable conditions are found during surveillances, nonconformance and corrective action request procedures would be necessary to assure that these conditions are reported and processed in accordance with the controls identified in the quality program. The surveillance, nonconformance, and corrective action procedures have not been approved and implemented at this time. The nonconformance procedure QAP 15-1 and corrective action reports are in "draft" form being circulated for review.

WMPO STANDARD DEFICIENCY REPORT

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Completed by Originating QA Organization

1 Date <u>June 4, 1987</u>	2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page <u>1</u> of <u>2</u>
3 Discovered During <u>WMPO Audit 87-5</u>	3a Identified By <u>G. Heaney</u>	3b Branch Chief Concurrence Date <u>NA</u>	4 SDR No. <u>I</u> Rev. <u>0</u>
5 Organization <u>SNL</u>	6 Person(s) Contacted <u>R. Richards</u>		7 Response Due Date is <u>20 Working Days from</u> Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) <u>See Page 2</u>			
9 Deficiency <u>See Page 2</u>			
10 Recommended Action(s): <input type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective <u>See Page 2</u>			

Aprvl.

11 QAE/Lead Auditor Date	12 Branch Manager Date	13 Project Quality Mgr. Date
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Completed by Organization in Block 5

14 Remedial/Investigative Action(s)		15 Effective Date _____
<i>DRAFT</i>		
16 Cause of the Condition & Corrective Action to Prevent Recurrence		17 Effective Date _____
18 Signature/Date		

Comp. by Orig. QA Org.

19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Amended Response <input type="checkbox"/> Reject	QAE/Lead Auditor/Date	Branch Manager/Date
20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date	Branch Manager/Date
21 Verifi- cation	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date	Branch Manager/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date

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Requirement

Sandia National Laboratories NNWSI QAPP Rev. A Paragraph 12.2 requires that "all measuring and test equipment calibration will be accomplished using written procedures and will be traceable either to the National Bureau of Standards or to other nationally recognized physical standards."

Deficiency

Contrary to the above requirement, the Calibration Lab at Sandia does not utilize calibration procedures which are reviewed or approved in accordance with the NNWSI Quality Assurance Program Plan NVO-196-17 Rev. 4. Additionally, records indicating traceability to the National Bureau of Standards or other nationally recognized physical standards are not available for review and audit by NNWSI Quality Assurance personnel. Therefore, the calibration status of measuring and testing instruments is indeterminant.

Recommended Action

1. Review to determine if Sandia has performed Quality Level I or II work with calibrated instruments for which traceability to the National Bureau of Standards or to other nationally recognized physical standards cannot be determined.
2. Provide a corrective plan to resolve the above deficiencies.

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Completed by Originating QA Organization
Completed by Organization in Block 5
Comp. by Orig. QA Org.

1 Date June 4, 1987		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During WMPO Action 87-5		3a Identified By Bill Sublette Jim Gromer		3b Branch Chief Concurrence Date	
5 Organization SNL		6 Person(s) Contacted Fran Nimick and Ron Price		4 SDR No. <u>J</u> Rev. <u>0</u>	
7 Response Due Date is 20 Working Days from Date of Transmittal					
8 Requirement (Audit Checklist Reference, if Applicable) See Page 2					
9 Deficiency See Page 2					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective Initiate NCR for the review and disposition of the data as required by SOP-03-03.					
11 QAE/Lead Auditor Date		12 Branch Manager Date		13 Project Quality Mgr. Date	
14 Remedial/Investigative Action(s)					
<p style="font-size: 2em; margin: 0;">DRAFT 6-5-87</p>					
15 Effective Date _____					
16 Cause of the Condition & Corrective Action to Prevent Recurrence					
17 Effective Date _____					
18 Signature/Date					
19 Response		<input type="checkbox"/> Accept <input type="checkbox"/> Amended <input type="checkbox"/> Reject <input type="checkbox"/> Response		QAE/Lead Auditor/Date	
20 Amended Response		<input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date	
21 Verifi- cation		<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date	
22 Remarks					
23 QA CLOSURE		QAE/Lead Auditor/Date		Branch Manager/Date	
PQM/Date					



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Requirement

NVO 196-17/NQA-1 Section 5.0 requires that approved procedures be developed and implemented for the control of activities affecting quality.

Ref: Modified Work Plan for WBS 1.2.4.2.1.3.S
"Laboratory Properties" and Audit Checklist 87-5-2

Deficiency

1. During the period 1980-1986, technical procedures were generated (NNWSI L01B1.A-04/21/81 "Thermal Tests" and NNWSI L03.A-01/27/83 "Physical Properties Tests"). These procedures were used to govern the subject activities. Contrary to the above requirement, these technical procedures were not reviewed/approved by WMPO approved quality assurance program.
2. Also during this period tests were performed on core samples received which were designated QA Level III or which ~~had~~^{had} no QA grade. Calibration reports and custody forms were reviewed at random and identified the following tests were performed:

Thermal Tests: U12E-RM-P1 7.2-8.3; 14-2-14.9; 23-5-24.4

Physical Properties Tests: USWE4 2165.9-2166.2; 2571.9-2572.3;
2989.4-2989.75

Performance of the above tests to the referenced procedures constitutes the use of nongraded material and data in a currently graded system. As currently outlined in WBS 1.2.4.2.1.3.S, Subtasks B.1 and B.2, this ungraded material and test data would be used to generate QA Level II results to support the ACD. The condition outlined above also applies to WBS 1.2.4.2.1.1 Subtask A.4.

Forrest Peters

Observation No. 1

The Reference Information Base (RIB) has been issued as a Sandia Letter Report in 1986 (SLTR 86-5005), and in 1987 (SLTR 87-6001).

According to DOP 6-2 Paragraph 4.5, SLTRs cannot be referenced in SAND documents. Thus, the RIB cannot be referenced in SAND documents, despite the fact that the RIB, as stated in the modified work plan, is to "serve as a common source of project controlled information for use in interim design and performance assessment activities." This would appear to indicate that SNL cannot use the RIB for its intended purpose.

Jim Gromer
Bill Sublette

Observation No.2

The storage of samples in the SNL NNWSI Core Library is presently being guided by QAP XI-11 Rev. B and DOP 8-1 which is the "Sample Identification and Handling Requirements." There is an apparent need for a DOP on the storage of samples in the core library. DOP 8-2, which is presently in rough draft, addresses this subject and should be in place for the operation of the SNL Core Library.

R. Klemens

Observation No. 3

DOP 4-1, "Procurement Document Requirements" does not require verification (by the Division Supervisor or other responsible person) that technical reviews of purchase requisitions have been conducted.

T. Vetter

Observation No. 4

In paragraph 5.5 of "Draft" procedure QAP 15-1, an option is stated that would allow for the PI to use QA Level I and II requirements for QA Level III.

If the QA Level I and II were used for Level III, partial implementation of the requirements could occur, i.e., only use those desired activities.

When it is desired to use higher level requirements for items, standards would require all of the requirement of the higher level would be applicable to the item that was elevated. This is not clear in the draft procedure and would need further clarification. This observation may be applicable to all areas where elevating of levels is permitted.

George Dymmel
Gerard Heaney

Observation No. 5

Design studies under WBS 1.2.4.3 Activity are presently going on at QA Level II designation. However, it is not yet firmly determined if any of these studies are going to be used in advanced conceptual design development. Some of these QA Level II studies reference technical publications and Sandia published reports. Data was collected to support these studies from the publications and reports at a time when NNWSI QA levels had not been established and no NNWSI approved QA program in place. It is a concern of the audit team that these studies are proceeding without a firm decision that any of these studies will be used for ACD and any subsequent repository licensing activities. At present, there is no intention to qualify any data generated when QA levels were not in place or generated under an approved QA plan, until it is determined that the design studies are actually going to be used for ACD and/or LAD activities. The audit team opinion is that some of the data previously generated will be used in design and licensing activities, i.e., seismic data, boreholes at the proposed locations of the repository, and waste form source terms. A delay in qualifying this data could have adverse ramifications in design activity if this data would fail to qualify for use in licensing and would have to be redone. The audit team does not agree with the present approach of not proceeding to qualify appropriate data pending the decision of which design studies are applicable to ACD and LAD activities. Based on the audit observations and the necessity in licensing design activities to use qualified generated data, that the procedure to qualify applicable data under SOP-03-03 provisions be initiated promptly by Sandia.

R. W. Clark

Observation No. 6

Observation

General

Organization Chart Figure 1 of Sandia National Laboratories QAPP SLTR86-0001 Rev. A and Section 1 of this same document need elaboration in order to more fully comply with SOP-02-01 Rev. 1 requirements.

Specific

- 1) Organization Chart Figure 1 of the QAPP should be revised to show the office of "Director of Nuclear Waste Management and Transportation" - this is the office to whom SNL NNWSI Project Manager reports to. A description of his responsibilities in relation to Department 6310 should be added to the body of Section 1 of QAPP.
- 2) The Organization Chart should also show the title, "Quality Assurance Coordinator," for the office presently held by R. R. Richards.
- 3) Also, the chart should depict that QA direction from this QA Coordinators Office is given to the Divisions - this should also be described in the body of Section 1 of QAPP.
- 4) Lines of communication between the Divisions and upper management should be described in Section 1 of QAPP.
- 5) Organization Chart should show the corporate QA office and its function with relation to Department 6310 should be described in Section 1 of QAPP.

R. W. Clark

Observation No. 7

Observation

QAPP Rev. A Section 2.5.2 and QAP 2-5 Section 5.2.1 provide for the requirement that training be performed for changes to policies and procedures, however, the training documents themselves, "Familiarization Program Document" and QAP 2-5(1) do not indicate the revision level of the procedures that training was provided in. Specifically, the latest training of personnel on DOP 3-3 "Analysis Definition Requirements" and DOP 5-2 "Technical Procedure Requirements" is recorded on "Familiarization Program Documents." The revision level of both of these procedures was at Rev. A at the time the training was conducted, however, the document does not indicate a revision level. This observation is generic to all training of personnel in all procedures to date.

Forrest Peters

Observation No. 8

The Reference Information Base (RIB) (SLTR87-60001) identifies the quality levels which are to be associated with most of the information which is contained in the RIB, as quality Level 3. This includes information and data from other participating organizations.

This appears to be inappropriate, because SNL apparently does not know what QA levels, if any, were actually assigned to the activities which produced that information or data when it was produced by other participating organizations.

It is true that the quality levels do need to be identified, but there should be a procedure to determine the actual quality level which is to be associated with the information in the RIB. This can probably be done only by the participating organization which produced the data or information.

F. Peters

Observation No. 9

DOP 3-7, Technical Data Base and DOP 3-8, Reference Information Base do not contain any definitive criteria or specifications for what is to be entered into either the Site Engineering Properties Data Base (SEPDB) or the Reference Information Base (RIB). As a result, the Task Leaders for these data bases have no definitive guidance for what belongs in these data bases. In addition, the SNL personnel do not have any definitive guidance for what they should submit for entry into these data bases. Furthermore, there is apparently no definitive guidance by SNL to the other Participating Organizations as to what those organizations should submit for entry into these data bases.

T. Vetter

Observation No. 10

Section 4.0 "Procurement Document Control" requires purchase orders/contracts be reviewed to assure that the requirements for the item/service be specified in the procurement document. Documents released prior to the "Stop Work Order" do not contain the current quality levels and/or quality controls in the current system.

A review of PO/contract 95-8399 identified the following concerns from the records.

- 1) The quality levels have changed from II to I and III, which invalidates the original "QA Requirements for Purchase Requisitions" form from DOP 7-1.
- 2) EP-0002 does not address surveillances or Audits.
- 3) The Vendor is permitted to subcontract calibration without SNL's review and approval of the subcontractors QA program. (Ref. EP-0002, p. 14, para. 2.4.1 and QAPP 4.1.1(3) page 34).

Based upon this PO review, a concern exists that purchase orders/contracts released prior to the "Stop Work Order" may not identify the correct quality level or the QA requirements implemented since the lifting of the "STOP WORK ORDER."

G. Heaney

F. Peters

Recommendation No. 1

During review and discussion with Sandia personnel of the Modified Work Plan for Site Geology (NNWSI WBS Element 1.2.3.2.1.1.S), several items contained within the work plan have changed since its latest revision.

- 1) Task A.4 Soil Properties, Hydrographic Data indicates that NRC Regulatory Guides 1.132 and 1.138 are available technical procedures. However, it is not the intent to endorse and implement all the requirements contained within these regulatory guides. It is recommended to revise the work plan to explain that these regulatory guides will be used as references to develop implementing technical procedures in carrying out soil property and hydrographic data activities.
- 2) Task A.4 B indicates that surveying is to be a QA Level III activity. Discussions with Sandia personnel indicate that this activity is to be a QA Level I or II activity. It is recommended to revise the work plan to indicate the proper QA level.
- 3) The work plan refers to the Tuff Data Base which has been renamed as the Site and Engineering Properties Data Base. It is recommended this change be reflected in the next revision of the work plan.

memorandum

DATE: MAY 15 1987

REPLY TO
ATTN OF: RW-223

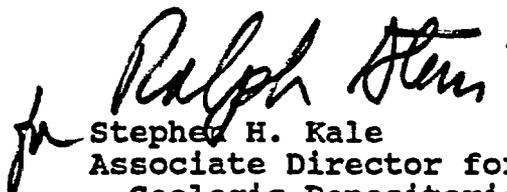
SUBJECT: DOE Meeting With States and Indian Tribes, May 28, 1987,
Las Vegas, Nevada

TO: Distribution

Attached is the final agenda and reference package together with a Table of Contents for the May 28, 1987, Department of Energy meeting with States and Indian Tribes in Las Vegas, Nevada.

This meeting will be held at the Flamingo Hilton Hotel, 3555 Las Vegas Boulevard South, in Las Vegas, (702) 733-3100 or (800) 732-2111. If you have any questions, please contact Barry Gale or Judy Leahy at (202) 586-1116.

I am looking forward to seeing you in Las Vegas.



Stephen H. Kale
Associate Director for
Geologic Repositories
Office of Civilian Radioactive
Waste Management

Attachment

DOE Meeting with States and Indian Tribes Distribution List:

J. Anttonen, DOE-PO/BWIP
H. Aronson, Aronson & Associates
A. Barros, Nez Perce Indian Nation
A. Benson, DOE-HQ/OGR
W. Bishop, WA-DOE
H. Black, State of Oregon
M. Blazek, OR - DOE
H. Bohlinger, State of Louisiana
J. Bresee, DOE-HQ/OGR
G. Bronson, CTUIR
M. Brown, Rockwell Hanford Operation
W. Burke, CTUIR
P. Bussey, Rockwell Hanford Operatio
G. Chehak, NCAI
J. Comins-Rick, DOE-PO/BWIP
S. Crowe, Yakima Indian Nation
R. DeVille, State of Louisiana
L. Dick, CTUIR
B. Dixon, State of Oregon
B. Easterling, DOE-HQ/OPO
R. Forsythe, State of Mississippi
B. Foster, NCSL
J. Friloux, State of Louisiana
S. Frishman, State of Texas
B. Gale, DOE-HQ/OGR
R. Gale, DOE-HQ/OPO
D. Gassman, DOE-PO/OCC-NV
J. Gervers, Latir
K. Goodmiller, GAO
K. Gover, Nez Perce Indian Nation
J. Green, Jr., State of Mississippi
C. Greene, Nez Perce Indian Tribe
G. Greene, Nez Perce Indian Tribe
R. Halfmoon, Nez Perce Tribal Exec.
D. Hancock, Southwest Research and I
B. Hanson, GAO
M. Harris, Bacon & Hunt
V. Harrison, Nez Perce Tribe
M. Henry, Nez Perce Indian Nation
D. Hester, CTUIR
R. Hilley, DOE-HQ/OGR
R. Holden, NCAI
J. Hovis, Yakima Indian Nation
N. Hovis, Yakima Indian Nation
D. Hoyle, AIF, Inc.
T. Husseman, State of Washington
J. Hutchins, Council of Energy Resou
T. Isaacs, DOE-HQ/OGR
R. Jim, Yakima Indian Nation
C. Johnson, State of Nevada
S. Kale, DOE-HQ/OGR
F. Khatat, BIA
G. King, DOE-HQ/OPO
K. Klein, DOE-HQ/OSTS
J. Knight, DOE-HQ/OGR
S. Kraft, EEI
F. Kugzrak, Nez Perce Tribe
J. Leahy, DOE-HQ/OGR
D. Lettig, Yakima Indian Nation
R. Loux, Jr., State of Nevada
E. Lundgaard, DOE-PO/NNWSI
L. Marks, DOE-HQ/OSTS
B. Martin, Hall & Associates
S. Martin, State of Mississippi
L. McClain, DOE-PO/SRPO
C. McDavid, WESTON
A. McDonough, DOE-HQ/OGR
P. McGinn, Weston
D. Meier, Weston
R. Moffett, Nez Perce Indian Nation
M. Murphy, Duryea, Murphy
R. Mussler, DOE-HQ/OGC
J. Neff, DOE-PO/SRPO
T. Novak, State of Washington
J. Palmer, State of Mississippi
J. Parker, State of Washington
R. Patt, State of Oregon
E. Patten, Facilitator
C. Peabody, DOE-HQ/OGR
H. Penney, Nez Perce Indian Nation
M. Powell, DOE-PO/BWIP
M. Power, State of Washington
W. Probst, DOE-HQ/OGR
D. Provost, Office of High Level Nuc
D. Quaempts, CTUIR
W. Rogers, CERT
S. Rousso, DOE-HQ/ORM
C. Runyon, NCSL
J. Saltzman, DOE-HQ/OPO
B. Schine, DOE-HQ
C. Scott, Nez Perce Tribal Exec. Com
L. Shaw, WESTON
J. Siegel, AIF, Inc.
R. Siek, Council of Energy Resource
A. Slickpoo, Nez Perce Indian Nation
W. Spell, State of Louisiana
L. Spruill, State of Mississippi
R. Stein, DOE-HQ/OGR
L. Steinman, Office of High Level Nu
D. Stevens, David W. Stevens, Inc.
L. Stevenson, WESTON
D. Stewart-Smith, OR-DOE
N. Still, NRC
R. Storey, State of Utah
D. Tahkeal, Yakima Tribal Council
B. Taylor, BIA
D. Tousley, Harmon & Weiss
D. Vieth, DOE-PO/NNWSI
T. Webster, Indian Health Services
J. Wesley, DOE-HQ/OGR
D. White, Nez Perce Tribal Exec. Com
M. Whitman, Consultant
M. Wilder, State of Washington
D. Wilson, Nez Perce Tribal Exec. Co
J. Wisniewski, DOE-HQ/CP
J. Wittman, Yakima Indian Nation
D. Wolfe, CTUIR
B. Yallop, Yakima Indian Nation

AGENDA
DOE MEETING WITH STATES AND INDIAN TRIBES
Las Vegas, Nevada
May 28, 1987

<u>Time</u>	<u>Item</u>	<u>Responsibility</u>	<u>Purpose</u>	<u>Reference</u>
8:30 a.m.	Welcome	DOE, State and Indian Tribal representatives	Welcome and introduce participants	
8:45	Purpose of meeting	Moderator	Introduce purpose and format of meeting	
8:50	Review of commitments from Spokane meeting	S. Kale	Report on status of commitments	List of Commitments
9:05	Coordinating Group Meetings	S. Kale	Provide information and discuss scheduling of meetings	Proposed master calendar
9:30	Site characterization activities and plans			
	o Current and near-term activities	R. Stein	Provide information	
	o Status and schedule for SCP production	R. Stein	Provide information	
	o General contents and key issues	R. Stein	Provide information	
10:30	B R E A K			
10:45	o Response to NRC comments	R. Stein	Provide information	
	o DOE SCP outreach plans	B. Gale	Discuss the number and place of briefings and hearings associated with release of SCPs	
	o States and Indian Tribes SCP outreach plans	State and Indian Tribal representatives	Discuss the outreach activities associated with release of SCPs	
11:45	Public question and answer session	Moderator with DOE, State and Indian Tribal officials	Provide opportunity for the public to ask questions	
12:30	L U N C H			

<u>Time</u>	<u>Item</u>	<u>Responsibility</u>	<u>Purpose</u>	<u>Reference</u>
1:45	Financial Assistance Programs			
	o Revised grant applications procedures	J. Bresee	Present revised grant procedures	Grant review schedule
	o States and Indian Tribes grant funded activities	State and Indian Tribal representatives		
	o Status of current applications and out-year forecast	State and Indian Tribal representatives		
3:45	B R E A K			
4:00	Mission Plan		Update status of draft Mission Plan Amendment	Secretary Herrington's statement before the Senate Subcommittee on Nuclear Regulation
	o Summary of comments	R. Gale		
	o Status of Amendment	R. Gale		
	o Status of second repository program	S. Kale		
4:30	Wrap-up and review of commitments from this meeting, and proposed date and location of next meeting	Moderator	Obtain agreement on commitments from this meeting and recommendations on location and time of next meeting	
5:00	Public question and answer session	Moderator with DOE, State and Indian Tribal officials	Provide opportunity for the public to ask questions	
5:45	A D J O U R N			

REFERENCE PACKAGE

DOE MEETING WITH STATES AND INDIAN TRIBES

MAY 28, 1987

LAS VEGAS, NEVADA

TABLE OF CONTENTS

- o List of Commitments from Spokane Quarterly Meeting
- o Proposed Master Calendar for DOE Coordinating Group Meetings
- o Grant Review Schedule
- o Secretary Herrington's Statement before the Senate Subcommittee on Nuclear Regulation

SPOKANE QUARTERLY MEETING COMMITMENTS

1. DOE will inform the States and Indian Tribes of steps to ensure opportunities for meaningful participation of the States and Indian Tribes in the DOE/NAS technical meetings.
2. DOE will develop a proposal for a one-year calendar of coordinating group meetings and send it to the States and Indian Tribes for comment.
3. DOE will send a copy of the FY 88 budget request to the States and Indian Tribes.
4. BWIP will meet with the State of Washington and the Indian Tribes to discuss the study on the diameter of the exploratory shaft that is reflected in the Mission Plan Amendment.
5. DOE is available to meet with the States and affected Indian Tribes to discuss the Mission Plan Amendment before the April 3 deadline for comments.
6. At the DOE/NRC Interagency Coordinating Committee meeting, DOE will discuss with the States and Indian Tribes the LSS and the negotiated rulemaking, pending the S. Kale conversation with procurement officials.
7. BWIP will meet during the week of February 17 - 20 with the State of Washington and the Indian Tribes to address technical scoping and how full-year funding can be awarded in an expeditious manner.
8. BWIP will provide to the State of Washington and the Indian Tribes the exact date for closure on their grants as soon as possible after the meeting referenced above.
9. Each Project Office will continue to work with the States and Indian Tribes to come to agreement on full-year grants.
10. DOE will put on the ISCG agenda a discussion of grant problems and possible approaches to resolve problems.
11. DOE/HQ and BWIP will contact the State of Washington and the Indian Tribes to discuss and resolve quality assurance issues.
12. DOE will provide a description at the ISCG of the format of SCP reference documents and of the locations where the documents will be provided, and DOE will provide all reference documents at the same time the SCPs are released.

13. NNWSI will provide the State of Nevada with letters regarding participation in the stop work orders, and will provide a briefing at the State's request.
14. DOE will determine whether there are any studies (ongoing or planned) about barge transport to site-specific locations within Texas.
15. DOE/HQ and the Project Offices will:
 - a) continue to work on near-term funding issues, identify any recommendations for changes, and report at the next ISCG meeting; and
 - b) work on the near-term needs for urgent action to release funds.
16. States and Indian Tribes will make recommendations on how DOE should publicize quarterly meetings.
17. DOE will poll the States and Indian Tribes on the proposal to hold the next quarterly meeting in Las Vegas and on the date for that meeting.

o Proposed Master Calendar for DOE Coordinating Group Meetings

DOE COORDINATING GROUPS

STATES/INDIAN TRIBES
(S/T)

INSTITUTIONAL/
SOCIOECONOMIC (ISCG)

QUALITY ASSURANCE (QACG)

TRANSPORTATION (TCG)

* INTERAGENCY COORDINATING
COMMITTEE--LSS (ICC)

ENVIRONMENTAL (ECG)

TECHNICAL CODE (TCCG)

GEOSCIENCES (GCG)

* PERFORMANCE/RISK
ASSESSMENT (P/RACG)

* REPOSITORY/WASTE PACKAGE/
MATERIAL CHARACTERIZATION
(R/WPCG)

LICENSING (LCG)

PROJECT MANAGEMENT (PMCG)

* New group

JUNE

1987

SUN	M	T	W	TH	F	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18 TCG Nashville, TN.	19	20
21	22	23	24	25	26	27
		DOE - NRC ← Richland, Wash. →				
28	29 NRC Hosted Wash, D.C. (DOE/NRC)	30				

JULY

1987

SUN	M	T	W	TH	F	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15 ISCG Seattle, Wash. →	16 ISCG	17	18
		DOE - NRC ← Richland, Wash. →				
19	20	21	22 QACG	23 QACG DENVER, CO.	24	25
26	27	28 GCG	29 GCG	30 GCG	31	

AUGUST

1987

SUN	M	T	W	TH	F	SAT
						1
2	3	4 P/RACG ← Wash, D.C. →	5 P/RACG	6	7	8
9	10	11 DOE - NRC ← Nevada (Site) →	12	13	14	15
16	17	18 TCCG DOE - NRC → ← Las Vegas →	19 TCCG	20	21	22
23	24	25 DOE - NRC ← Wash, D.C. →	26	27	28	29
30	31					

SEPTEMBER

1987

SUN	M	T	W	TH	F	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15 TCG DENVER ECG ←	16 TCG ECG Wash, D.C. →	17 ECG	18	19
20	21	22 GCG ← Wash, D.C. →	23 GCG	24 →	25	26
27	28	29	30 S/T Seattle, Wash.			

OCTOBER

1987

SUN	M	T	W	TH	F	SAT
				1	2	3
4	5	6	7	8	9	10
		DOE - NRC → ← Richland, Wash. →				
11	12	13	14	15	16	17
18	19	20	21	22	23	24
				QACG Amarillo, TX.		
25	26	27	28	29	30	31

NOVEMBER

1987

SUN	M	T	W	TH	F	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
			TCCG	TCCG		
15	16	17	18	19	20	21
		R/WPCG	R/WPCG	R/WPCG		
		← Wash., DC. → ISCG Las Vegas, NV.				
22	23	24	25	26	27	28
29	30					

DECEMBER

1987

SUN	M	T 1	W 2	TH 3	F 4	SAT 5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

JANUARY

1988

SUN	M	T	W	TH	F 1	SAT 2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19 ECG ←	20 ECG LAS VEGAS	21 ECG OACG LAS VEGAS →	22	23
24	25	26	27 S/T Amarillo, TX.	28	29	30
31						

FEBRUARY

1988

SUN	M	T	W	TH	F	SAT
	1	2 P/RACG Richland, Wash.	3 P/RACG	4	5	6
7	8	9	10	11	12	13
14	15	16	17 TCCG	18 TCCG	19	20
21	22	23	24	25	26	27
28	29					

MARCH

1988

SUN	M	T	W	TH	F	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16 ISCG Amarillo, TX.	17 ISCG	18	19
20	21	22 GCG Amarillo, TX.	23 GCG	24	25	26
27	28	29	30			

APRIL

1988

SUN	M	T	W	TH	F	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21 QACG Albuquerque	22	23
24	25	26	27	28	29	30

MAY

1988

SUN	M	T	W	TH	F	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17 ECG R/WPCG ← Las	18 ECG Seattle, Wash. R/WPCG Vegas, NV	19 ECG R/WPCG →	20	21
22	23	24	25	26	27	28
29	30	31				

Three-year budget and program projections to POs by end of January.

Applicants prepare proposals and revise three-year projections

Applications received by POs

POs set 90-day review schedule

POs send notification of application receipt specifying review schedule

POs prepare analyses and recommendations within 30-days

HQ reviews analyses and applications within 14 days

Tiger team review

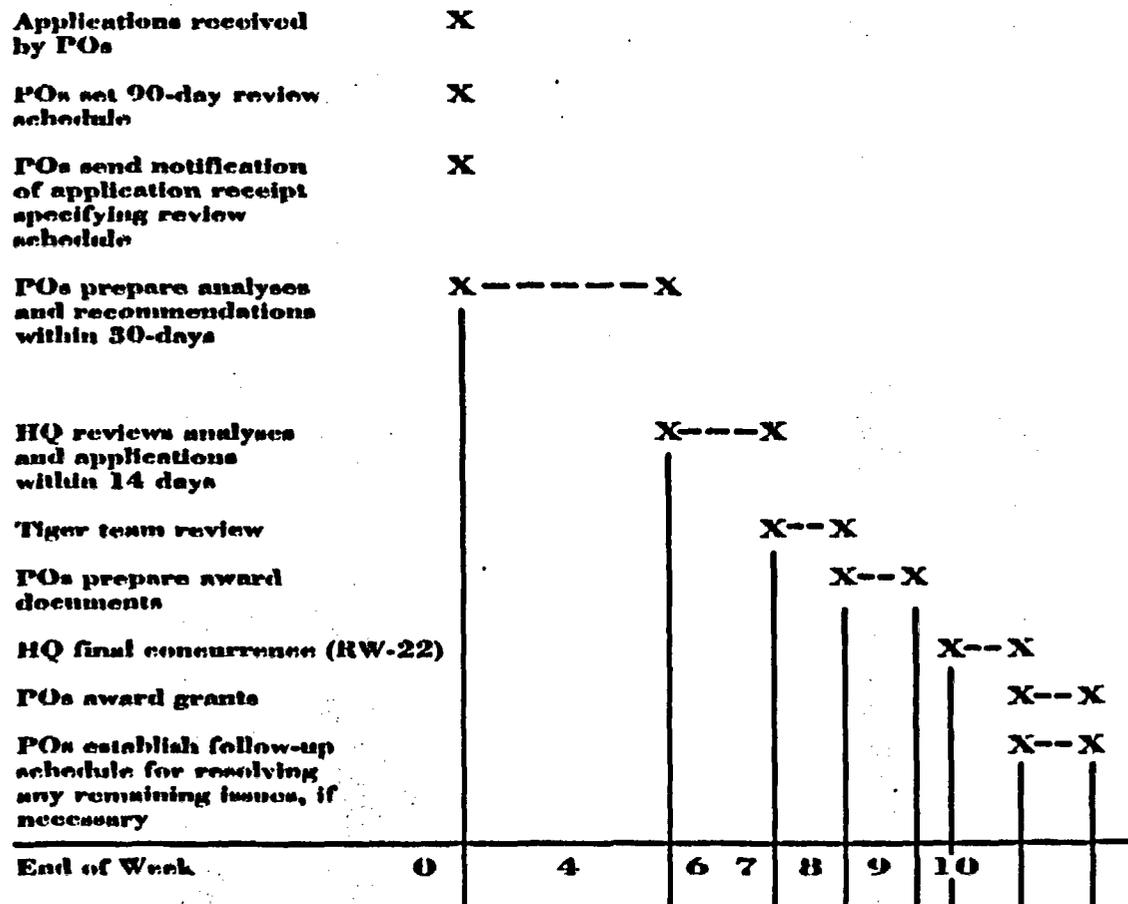
POs prepare award documents

HQ final concurrence (RW-22)

POs award grants

POs establish follow-up schedule for resolving any remaining issues, if necessary

Grant Review Schedule



STATEMENT OF

**JOHN S. HERRINGTON
SECRETARY OF ENERGY**

BEFORE THE

**SUBCOMMITTEE ON NUCLEAR REGULATION
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE**

APRIL 23, 1987

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to appear before you today to review policy issues of interest to the Subcommittee regarding the program being carried out under the Nuclear Waste Policy Act of 1982 (the NWPA). With me is Ben C. Rusche, my Director of the Office of Civilian Radioactive Waste Management (OCRWM)..

We have prepared a Draft Amendment to the Mission Plan for the Civilian Radioactive Waste Management Program. In that document, which we sent to the States, affected Indian Tribes, the Nuclear Regulatory Commission (NRC) and other Federal agencies for comment -- and made available for public inspection -- we discuss significant developments and new information in the waste program.

The Mission Plan is intended to keep Congress fully informed of progress in the program and the amendment will ensure that the Plan reflects current program status and our assessment of needed alterations. After review of the comments received on the draft, DOE will revise the amendment in response to the comments as appropriate and will submit it formally to Congress for information and direction. We would expect this to occur early this summer, and earnestly seek Congressional action on the proposed program revisions. If no action is taken by the Congress, we will continue with the first repository program and return to the search for specific sites for a second repository.

As you requested in your letter of invitation, I would like to give a brief status of the waste program and address the specific points of interest to the Subcommittee. For clarity I have attached several tables and charts to my statement. For

frame of reference, Table 1 contains the FY 1987 major funding levels and the FY 1988 Budget Request.

FY 1987 FUNDING

The funding level provided by Congress for FY 1987 is \$499 million, of which \$420 million has been made available and \$79 million will be made available only by approval of the House and Senate Appropriation Subcommittees on Energy and Water Development, and certification by me that a good faith effort has been made to comply with the requirements of the NWPA relative to consultation and cooperation with States and Indian Tribes.

To this end, we have initiated expanded consultation activities and have under preparation a report which, when completed, I will submit to Congress, requesting the remaining \$79 million.

Since enactment of the Continuing Resolution and the provisions regarding the limitations on accessibility of the \$79 million, we have increased our efforts to negotiate consultation and cooperation (C&C) agreements. In this regard, we are considering a number of new initiatives to encourage these negotiations. For example, DOE is willing to consider the adoption and implementation of de facto agreements or memoranda of understanding that would be of a smaller scope than a full C&C agreement, should the State or affected Indian Tribe find this advantageous. This would permit the adoption of procedures agreed upon by the parties immediately, even before the C&C agreement is fully developed. Such an approach is attractive because it recognizes the importance and the achievements of the

negotiation process that has been underway since the NWPA was signed into law.

But C&C negotiations and agreements are but one part of the process of working with affected parties. Interactions with affected and interested parties occur every day.

In addition, a number of actions outside formal C&C negotiations have been taken recently as a result of recommendations. For example, as States and Indian Tribes requested:

- o States and affected Indian Tribes are now invited to attend all OCRWM coordinating group meetings; and
- o Quarterly Meetings with States and affected Indian Tribes have been opened for the public to attend.

There are currently twelve Coordinating Groups and they are listed in Table 2. The Coordinating Groups meet two-to-four times per year and provide a forum for the discussion of common problems and their resolution. It is expected that additional coordinating groups will be established and existing ones abolished as requirements and priorities change.

Since the summer of 1984, Quarterly Meetings have been held with States and affected Indian Tribes to discuss topics mutually agreed upon for the agenda. As a result of recommendations by the States and Indian Tribes, these meetings will now be open to the public. The first meeting open to the public was held on February 12, 1987 in Spokane, Washington. The agenda was coordinated among the States, the Indian Tribes and DOE and a public announcement was made by the DOE Operations Office in Richland, Washington. The Draft Mission Plan amendment

was a major topic of discussion at the meeting. The next one of these meetings is scheduled for May 28 in Las Vegas, Nevada.

I mention these activities because I believe it is important to point out that, while formal consultation and cooperation negotiations are only required to begin after a candidate repository site is approved for site characterization, consultation and cooperation are everyday activities and are the responsibility -- DOE's responsibility, the States' and Indian Tribes' responsibility -- of all the affected parties.

FY 1988 BUDGET REQUEST

The FY 1988 funding level required to carry out the program as described in the draft Mission Plan amendment is estimated to be \$725 million. However, the actual funding level requested in DOE's FY 1988 budget was \$500 million. This level is based upon the recognition that Congressional direction provided in the FY 1987 Continuing Resolution indicated the need to interact with Congress and to address external issues before moving at the pace we believe is necessary.

Authorization for the higher funding level (\$725 million) is appropriate and consistent with the program presented in the draft Mission Plan Amendment and outlined in the FY 1988 funding estimate. Therefore, an amendment to the FY 1988 budget request is planned to be submitted to provide the required funding to carry out the program as described in the funding estimate. We seek your approval of the revised Mission Plan to provide direction concerning submissions of the FY 1988 budget amendment.

The FY 1988 budget request will provide for extensive site characterization activities, including the start of exploratory shaft construction, and intensive engineering tests and analyses to support the waste package and repository designs for the first repository. Actual exploratory shaft construction is planned to commence in FY 1988 at two of the three candidate repository sites approved by the President on May 28, 1986, for site characterization.

Table 3 reflects a possible FY 1988 allocation of \$500 million by task, within the Nuclear Waste Fund program. This allocation is currently under review to identify adverse impacts, which would result from a \$500 million FY 1988 funding level. Efforts to minimize these impacts could result in a change to this preliminary allocation.

If only \$500 million were appropriated in FY 1988, the revised program schedule, and planned accomplishments developed in support of the Draft Mission Plan Amendment would not be achieved. Listed below, by program, are the specific accomplishments which would be delayed.

First Repository

The exploratory shaft construction at the tuff and basalt sites would be delayed; final design of the exploratory shaft at the salt site would be delayed; the intensive surface-based site characterization activities would be reduced by 50 percent at all three sites; and the waste package and repository advanced conceptual design would be delayed. These delays would result in a slip in the schedule contained in the draft Mission Plan

Amendment of a minimum of 6 months. Additionally, financial assistance to affected States and Indian Tribes may be impacted.

Second Repository

The cooperative international activities in support of the second repository program would be slowed.

Monitored Retrievable Storage (MRS)

The operation of the MRS, if authorized as proposed, is linked to the construction authorization for the first repository which would be further delayed by a funding reduction to the \$500 million level. The MRS schedule would, therefore, slip past the first quarter of the 1998 deadline to begin acceptance of spent fuel and high-level waste.

Transportation and Systems Integration

Transportation activities and cask procurement would be delayed approximately one year.

FIRST REPOSITORY

Last May, I nominated five sites in Mississippi, Nevada, Texas, Utah and Washington as suitable for characterization and recommended to the President three of those sites for characterization as candidates for the first repository. The three sites are: the Yucca Mountain site in Nevada, the Deaf Smith County site in Texas and the Hanford site in Washington. The President approved my recommendation.

With the President's approval of the three sites to characterize, we have finally passed beyond the crucial decision of where to focus our repository siting efforts. That action formally marked the beginning of site characterization and

represented a major milestone in development of the Nation's nuclear waste disposal system.

Site characterization will take approximately six or seven years, depending on the site.

The experience gained in achieving the important milestone of approval of sites for characterization, and advances in the technical planning of the program, have led us to reassess the program and schedule for the first repository. The new schedule -- as presented in the draft Mission Plan Amendment -- shows a 5-year extension of the date for the acceptance of waste at the first repository, from 1998 to 2003. Table 4 attached to my statement shows the current schedule for the first repository as compared to the schedule contained in the 1985 Mission Plan.

There are several reasons for the near-term extension.

Among them are:

- o The additional time it took to meet the initial milestones in the NWPA, including optional steps taken to enhance State and Indian Tribe involvement;
- o The recognition that more time should be provided in the future for consultation and interaction with the States, affected Indian Tribes, and other parties; and
- o The recognition that more technical information is needed than was previously anticipated.

Since the NWPA was passed, and given the controversial nature of the program, many parties have insisted that the schedule specified in the Act was not realistic and not achievable. It has been pointed out on many occasions that the

schedule and the siting process are not reconcilable -- that to achieve one, it would be necessary to sacrifice the other.

DOE has attempted to meet both objectives and has developed an aggressive schedule that would have permitted the first repository to begin accepting waste in January 1998. However, at the same time, Mr. Rusche and I have insisted that the schedule not be allowed to prevail at the expense of technical excellence and public participation.

We now recognize that more information, more consultation and more time are required in the near-term to ensure public confidence in and development of the first repository for long-term (permanent) disposal. We remain optimistic in our planning but realize that, for many early actions, we underestimated the time required. Furthermore, the revised schedule recognizes the potential for contingencies that are yet to appear.

The 5-year extension for startup operations at the first repository, therefore, requires a reevaluation of the waste acceptance strategy. Based on our reevaluation, we believe that the most advantageous course includes the development of a Monitored Retrievable Storage (MRS) facility. And, as presented in the draft amendment, DOE believes it can start accepting waste for disposal in 1998 through the development of an MRS facility, which I will discuss in a moment.

Although we had planned to begin exploratory shaft construction at one or two of the sites this fiscal year, Congress, in the appropriation for the waste program for Fiscal Year 1987, specified that no funds are to be used for drilling any exploratory shaft at any site in FY 1987. However, Congress

did allow for other site-specific work to be conducted at reduced funding levels, and we are proceeding with these allowable characterization activities during this year.

The current activities at or related specifically to each of the candidate sites include the following:

- o At the Nevada site, land access is being pursued with other Federal agencies.
- o At the Washington site, site plans are proceeding for hydrology tests that will precede exploratory shaft drilling.
- o At the site in Texas, DOE is proceeding with its plans for obtaining access to the land. In late February, we met with property owners and held public meetings in Texas near the Deaf Smith County candidate site to describe project activities, studies and land access plans for the site and to answer questions. In addition, about 10 people from the DOE Salt Repository Project offices and the support contractor have moved from offices in Columbus, Ohio, to temporary office trailers placed on land leased by DOE near Vega, Texas. Since March 2, they have been available on a daily basis to respond to questions about job and contracting opportunities for local people and to assist in locating permanent office facilities for the project. Texas, unlike the Nevada and Washington candidate sites, has had no DOE office for this program located near the site or in the State.

Table 5 contains a breakdown of the FY 1987 budget request and appropriations (P.L. 99-591). The chart shows the amounts specifically requested and how they were allocated for each of the three candidate sites for the first repository.

Of the \$725 million estimated to be necessary to carry out the program in FY 1988 as described in the draft Mission Plan Amendment, \$525 million is estimated for first repository activities as shown previously in Table 1.

SECOND REPOSITORY

On May 28, 1986, following the announcement of the President's approval of three sites for characterization as candidates for the first repository and based on a number of factors, I announced that site-specific work for identifying new candidates for a second repository was postponed indefinitely. The basis for this decision, which is discussed in the draft Mission Plan Amendment, includes declining projections of the rates at which spent fuel will be discharged from commercial nuclear power plants, progress in siting the first repository and confidence in finding suitable sites among the three sites approved by the President for characterization. It also reflects the advantages to be gained from the experience of the first repository, the expectation of Congressional approval for the MRS facility, and responsible fiscal management.

Since that decision and with circulation of the Draft Mission Plan Amendment, many issues have been raised and much discussion, comment and thirteen legislative proposals have resulted.

I want to clarify, with regard to our decision, the following points: I have stated that "indefinite postponement" does not mean "cancellation." DOE has not abandoned a second repository.

When making the announcement I thought, based on the factors I mentioned earlier, that it was appropriate to leave the specific timeline for site-specific work open-ended. It has now become clear to me that leaving it open-ended has in itself led to confusion regarding our intent.

To clarify our intent and for planning purposes, my statement includes a revised timeline for milestones related to siting a second repository. I believe it is important to point out that the schedule has changed many times since passage of the NWPA; and, as we progress through the development of the first repository, I would suspect that additional adjustments may have to be made from time to time. However, through the many opportunities for dialogue -- formal and informal -- with Members of Congress and others, as we progress through the program and as conditions change (such as spent fuel projections), there will continue to be opportunities for Congressional direction and oversight.

Table 6 of my statement provides a schedule for second repository activities based on requirements of the NWPA, 1985 Mission Plan, schedules in the FY 1986 and FY 1987 budget

requests, and estimated schedules based on considerations of the Draft Mission Plan Amendment.

DOE remains fully committed to a two repository system and to carrying out the intent of Congress. The specific requirement related to the second repository is stated in the NWPA in terms of the maximum amount of spent fuel that the Nuclear Regulatory Commission can allow to be emplaced in the first repository until a second repository is in operation. The NWPA sets this figure at 70,000 metric tons.

Under the revised schedule for the first repository, this limit would be reached sometime after the year 2025 if the annual rate of waste emplacement is 3,000 metric tons. The experience of siting the first repository suggests that site-specific screening leading to the identification of potentially acceptable sites should start about 25 years before the start of waste acceptance for disposal at the second repository. Therefore, to have the second repository available by about 2025, site-specific studies need not start until the mid- to late 1990s, as presented in the schedule in Table 6.

For second repository activity, the FY 1987 funding level of \$19.8 million and the FY 1988 request for \$24 million (Table 1) provide for non-site-specific technical studies in alternative geologic media to determine their suitability for hosting a second geologic repository. This represents essentially level funding between FY 1987 and FY 1988 since postponement of site-specific activities resulted in a FY 1986 savings of \$3.2 million which was carried forward into FY 1987.

A significant portion of these studies is expected to involve cooperative efforts with other countries.

Should Congress not approve this fiscal year the program laid out in the draft Mission Plan Amendment for second repository activities, DOE would go back and review the more than 60,000 comments received on the Draft Area Recommendation Report issued in January 1986 and issue a final Area Recommendation Report which would formally identify 12 sites for field work leading to consideration as candidates for a second repository. An additional \$60 million would be required in FY 1988 for this work.

MONITORED RETRIEVABLE STORAGE

The NWPA (Section 141) directs DOE to complete a study of the need for and feasibility of a Monitored Retrievable Storage (MRS) facility, and to submit to Congress a proposal for the construction of one or more MRS facilities. After being enjoined from submitting the MRS proposal to Congress for more than a year, a Supreme Court ruling allowed us to submit it on March 31, 1987. Our proposal, as required by the NWPA, includes a program for siting, development, construction and operation of an MRS facility; should Congress approve its construction; a plan for funding the construction and operation of such a facility; and a plan for integrating such a facility into the overall Federal waste management system.

We continue to believe that an MRS facility should be an integral part of the waste management system. As described in our proposal, it would substantially enhance the waste management program and capabilities at an incremental cost of less than five

percent of the total program costs and would provide greater assurance that we could begin receiving waste in 1998.

We believe that an MRS, centrally located to the majority of the spent fuel generated, would enhance the disposal system by receiving and consolidating the spent fuel prior to shipping to the repository.

The proposal submitted to Congress is accompanied by Nuclear Regulatory Commission and Environmental Protection Agency comments, as well as the State and local community group comments.

In our proposal, we recommend that Congress:

- o Approve the construction of an MRS facility at Clinch River near Oak Ridge, Tennessee;
- o Limit the storage capacity at the MRS facility to 15,000 metric tons of spent fuel;
- o Preclude waste acceptance by the MRS facility until a construction authorization for the first repository is received from the NRC;
- o Direct DOE to implement measures responsive to the concerns and recommendations of the State and local governments; and
- o Direct DOE to implement the program plan accompanying the proposal.

The expenditures for the MRS program from the time of Congressional approval until the facility becomes operational are estimated at approximately \$907 million, of which approximately \$710 million would be used for construction. The annual operating costs for the facility, which would employ about

600 workers, would be approximately \$73 million, not including financial assistance and tax-equivalence payments. The estimates are higher for the initial years of operation, when up to 1600 sealed storage casks must be fabricated, and lower in the later years, when the MRS facility stops receiving spent fuel and is only shipping spent fuel in cannisters to the repository. Decommissioning would cost approximately \$83 million. These add up to a total construction, operation, and decommissioning cost of about \$3 billion.

The net cost to the total system is about \$1.5 billion because of savings at the repository and in the transportation system. The costs borne by the utility rate payers would be offset by savings in at-reactor storage costs; these costs would be avoided because an MRS facility would allow DOE to accept spent fuel at an earlier time and, under certain scenarios, it is possible that the addition of an MRS facility would result in net cost savings to the overall system. For example, it has been estimated that the deployment of an MRS facility consistent with the Draft Mission Plan Amendment would preclude the need for additional storage capability at more than 15 reactor sites and could offset more than 10,000 MTU of at-reactor storage. This incremental at-reactor storage is estimated to cost \$100,000 per metric ton, which would result in a savings of at least \$1 billion at the reactor sites. The financial costs of adding an MRS facility are considered small in comparison with the benefits.

From the time of Congressional approval to completion of construction of the MRS, it is estimated that 10 years are

required. Table 7 provides a timeline of the major milestones and program elements involved in the MRS deployment schedule.

Should Congress approve proceeding with an MRS facility, we are committed to seeking immediately to enter into a formal Consultation and Cooperation Agreement with the host State.

The FY 1987 allocation of \$20 million had assumed Congressional authorization to proceed; however, only \$352,000 has been expended through the first half of FY 1987.

The FY 1988 funding estimate of \$58 million for the MRS program assumes Congressional approval to proceed with activities that are critical to the deployment of an MRS facility.

PROPOSED LEGISLATION

As you requested in your letter of invitation, the following is a brief statement of our initial position on Senate Bills S.621, S.642, S.833, and S.839.

With respect to both S.621 and S.642, which would essentially amend the NWPA by removing the requirement to site, construct and operate a second repository, the Department does not at this time either support or oppose the Bills. We are in the process of reviewing the potential implications of them on the waste program.

S.833, regarding the prohibition of transporting waste through urbanized areas, the Department opposes, since the transportation safety record developed over the past years has demonstrated conclusively that spent fuel and high-level waste can be shipped safely even through ultra-urban areas.

Regarding S.839, which essentially provides financial incentives, the Department believes that its approach may have merit, since it appears to have well thought out funding advantages and addresses some valid issues in implementing the NWPA. However, because it is currently under policy review within the Department, we do not yet have a formal position.

NUCLEAR WASTE FUND

In April 1983, DOE adopted a fee of one mill (one-tenth of a cent) per kilowatt hour charged to utilities for all nuclear-generated electricity beginning April 7, 1983, as specified in the NWPA. This fee is referred to as an "on-going fee." In addition, spent fuel or high-level waste generated prior to that date is subject to a fee equivalent to an average charge of one mill per kilowatt hour. This fee is referred to as a "one-time fee." For the "one-time fee," utilities had until June 1985 to decide on one of three payment options. Those who chose to pay in one lump sum by June 1985, to save interest charges, made payments totalling more than \$1.4 billion. This represents more than half of the one-time fee liability of approximately \$2.3 billion for civilian nuclear waste in existence prior to April 7, 1983. Additionally, quarterly one-time fee receipts have totalled approximately \$9 million between July 1985 and March 1987.

The status of the revenues, including interest earned on investments and expenditures to date, is shown in Table 8.

With regard to the status of the defense waste fee, on April 30, 1985, the President determined that there was no basis for the establishment of a separate repository for disposal of

defense high-level waste and that the Secretary should proceed promptly with arrangements for the use of one or more of the repositories to be developed under the Act.

On December 2, 1986, DOE published a Notice of Inquiry (NOI) in the Federal Register that described the proposed method for calculating the fee for defense high-level waste. Following the 60-day comment period, comments were received from 26 sources.

The comments are now being evaluated by DOE's Offices of Civilian Radioactive Waste Management (OCRWM) and Defense Programs, and a final Federal Register Notice is planned for early this summer.

The primary concerns expressed by the commentors were:

- (1) that full cost would be recovered for the disposal of defense high-level waste considering the time value of money;
- (2) a concern that a rulemaking procedure should be used for determination of fee calculation methodology and payment schedule;
- (3) the lack of a payment schedule in the NOI;
- (4) the equitability of the relative quantities of civilian and defense waste; and,
- (5) the method proposed for sharing common fixed costs, such as development and engineering.

All comments are being carefully considered. After the fee calculation methodology has been finalized, OCRWM and Defense Programs will develop a Memorandum of Understanding that will include plans for requesting the appropriation of funds to pay the cost of disposal of defense high-level waste.

CONCLUSION

Mr. Chairman, this concludes my remarks. I would be happy to respond to any questions you may have and, with your permission, I may call on Mr. Rusche for more details.

#####

TABLE 1

FY 1988 CONGRESSIONAL BUDGET NUCLEAR WASTE FUND (\$in Thousands)		
	FY 1987 Approp.	FY 1988 Request
<u>NUCLEAR WASTE FUND</u>		
Repository Development		
o First Repository	\$307,446	\$525,044
o Second Repository	19,800	24,000
Monitored Retrievable Storage	20,000	58,000
Transportation and Systems Integration	26,000	63,043
Program Management and Technical Support	46,754	54,913
	<hr/>	<hr/>
	79,000 a/	
	<hr/>	<hr/>
TOTAL	\$499,000	\$725,000
Less		<u>225,000</u> b/
FY 1988 CONGRESSIONAL BUDGET REQUEST		\$500,000

- a/ Not currently available. Availability is subject to satisfactory completion of the terms contained in the Continuing Resolution, P.L. 99-500 and P.L. 99-591.
- b/ The funding level required to carry out the program as described in the Department of Energy's budget and in this statement and shown in the draft amendment to the Mission Plan is estimated to be \$725 million. The President's request is based upon the recognition that Congressional direction provided in the FY 1987 Continuing Resolution indicated the need to interact with Congress and to resolve external issues before moving forward as planned. A request for a higher funding level would be appropriate presuming satisfactory resolution of these issues. Therefore, upon satisfactory resolution, an amendment to the FY 1988 budget will be submitted to provide the required funding to carry out the program described herein.

TABLE 2

U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
EXISTING COORDINATING GROUPS

The following coordinating groups are currently in existence and supported by their own charters:

- o Site Characterization Plan Coordinating Committee
 - o Geoscience Coordinating Group
 - o Repository Coordinating Group
 - o Waste Package Coordinating Group
 - o Performance Assessment Coordinating Group
 - o Licensing Coordinating Group
 - o Quality Assurance Coordinating Group
 - o Transportation Coordinating Group
 - o Institutional Affairs Coordinating Group
 - o Project Management Coordinating Group
 - o OCRWM Information Resources Management Coordinating Group
 - o Environmental Coordinating Group
-
-

TABLE 3

NUCLEAR WASTE FUND
FY 1988 ALLOCATION BASED ON \$500 MILLION
(\$ in Millions)

First Repository	\$357.09
Second Repository	16.55
Monitored Retrievable Storage	39.50
Transportation and Systems Integration	42.95
Program Management and Technical Support	<u>43.91</u>
TOTAL	\$500.00

TABLE 4

**NUCLEAR WASTE POLICY ACT MILESTONES
COMPARISONS WITH NWPA, JUNE 1985 MISSION PLAN, AND DRAFT
AMENDMENT TO THE MISSION PLAN**

<u>ACTIVITY</u>	<u>NWPA REQUIREMENT</u>	<u>1985 MISSION PLAN</u>	<u>1987 DRAFT AMENDMENT</u>
1. Identify States w/ potentially acceptable sites	4/7/83	--	--
2. State/Tribal notification as to being potentially acceptable sites	7/7/83	--	--
3. Issue Siting Guidelines	7/7/83	12/84	--
4. Issue Mission Plan	5/84	--	--
5. Issue Environmental Assessments	--	11/85	--
6. 1st Repository Nomination/Recommendation of sites suitable for characterization	1/1/85	11/85	--
7. Presidential Approval of sites	--	1/86	--
8. Seek to enter into C&C agreements	7/86	--	--
9. Issue SCP's	--	3/86 tuff 3/86 basalt 10/86 salt	mid-87 tuff mid-87 basalt 1st Qt.88 salt
10. Initiate Construction of Exploratory Shafts	--	3rd Qt. 86 tuff 3rd Qt. 86 basalt 3rd Qt. 87 salt	2nd Qt. 88 tuff 3rd Qt. 88 basalt 4th Qt. 89 salt

* Informal C&C negotiations were initiated with the State of Washington and Umatilla Indian Tribes in mid 1983

(TABLE 4, cont'd)

<u>ACTIVITY</u>	<u>NWPA REQUIREMENT</u>	<u>1985 MISSION PLAN</u>	<u>1987 DRAFT AMENDMENT</u>
11. Testing to support DEIS complete	--	12/89	1st Qt. 92 tuff 1st Qt. 93 basal 1st Qt. 93 salt
12. Issue FEIS	--	12/90	4th Qt. 1994
13. President recommends site to Congress	3/31/87	3/91	4th Qt. 1994
14. Site designation effective	5/91	5/91	1st Qt. 1995
15. Submit License Application to NRC	--	5/91	1st Qt. 1995
16. NRC issues Construction Authorization	--	8/93	1st Qt. 1998
17. Initiate Repository Construction	--	8/93	1st Qt. 1998
18. NRC issues License for Phase 1 Operations	--	12/97	1st Qt. 2003
19. Phase 1 Repository Operations begins	--	1/98	1st Qt. 2003
20. Phase 2 Repository Operations begins	--	2/01	2nd Qt. 2006

TABLE 5

FY 1987 BUDGET
NUCLEAR WASTE FUND
(\$ in Millions)

	FY 1987 Congressional Request	FY 1987 Appropriation	Percent Change
First Repository			
Basalt	\$179.8	\$110.2	-39
Tuff	176.5	105.4	-40
Salt	185.5	66.3	-64
Technical Support	<u>-----</u>	<u>25.3</u>	<u>--</u>
Subtotal	541.8	307.4	-43
Second Repository	19.8	19.8	--
Monitored Retrievable Storage	46.0	20.0	-57
Transportation and Systems Integration	33.4	26.0	-21
Program Management and Technical Support	<u>69.5</u>	<u>46.8</u>	<u>-33</u>
 TOTAL	 \$710.5	 \$420.0	 -41

NOTE: If the \$79 million becomes available, \$73 million will be allocated to the First Repository and \$6 million to Transportation and Systems Integration.

TABLE 6

NUCLEAR WASTE POLICY ACT MILESTONES
 SECOND REPOSITORY
 COMPARISONS WITH NWPA, FY 1986 BUDGET REQUEST,
 JUNE 1985 MISSION PLAN, FY 1987 BUDGET REQUEST,
 IF MISSION PLAN AMENDMENT APPROVED,
 IF MISSION PLAN AMENDMENT NOT APPROVED

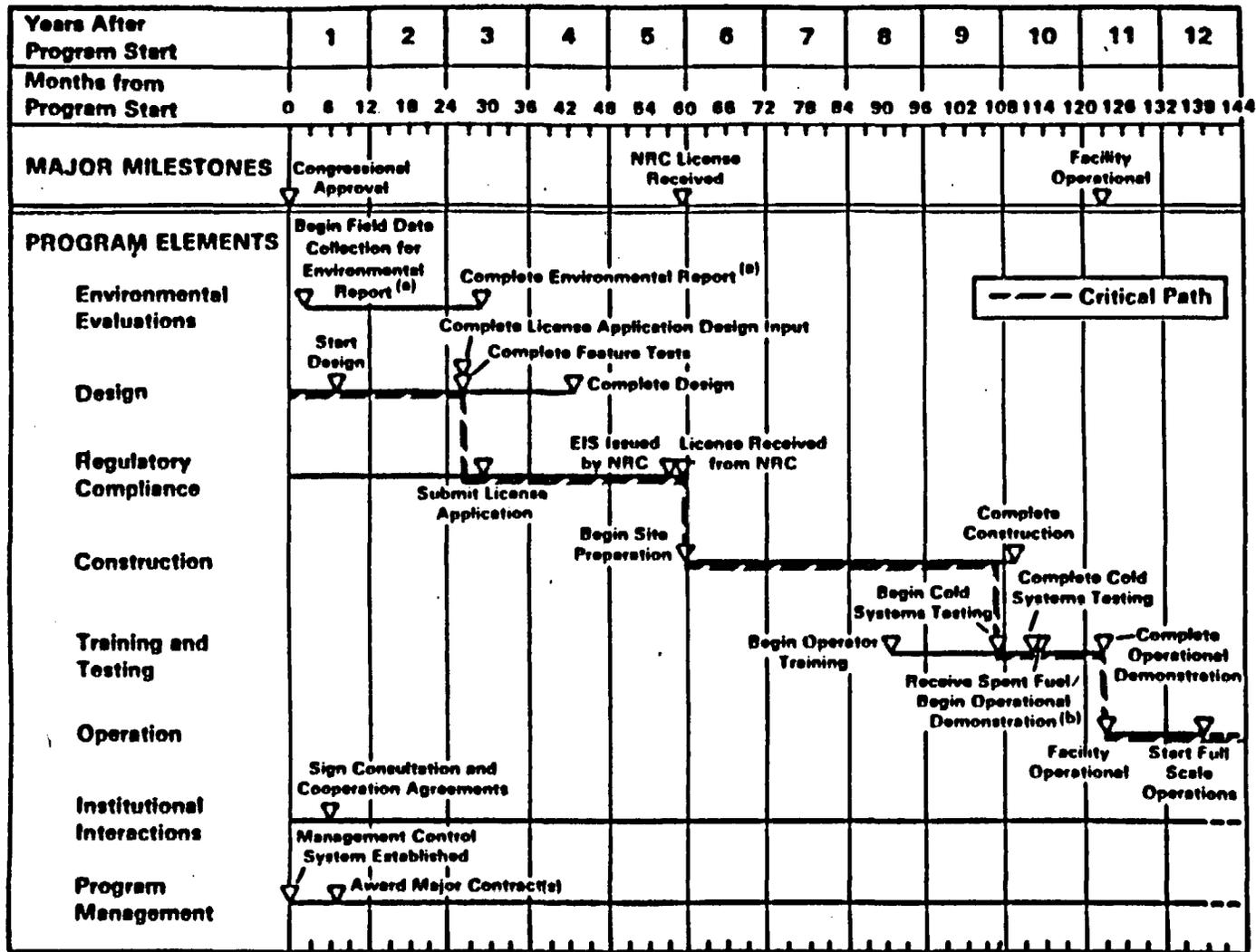
	<u>NWPA</u> <u>Requirement</u>	<u>FY 86</u> <u>Bud. Req.</u>	<u>1985</u> <u>MISSION</u> <u>PLAN</u>	<u>FY 87</u> <u>Bud. Req.</u>	<u>If MISSION PLAN</u> <u>AMENDMENT</u>	
					<u>Approved</u>	<u>Not</u> <u>Approved</u>
Begin National Survey	---	---	1981	---	1995	
Complete National Survey	---	---	4/83	---	1997	
Issue Draft Regional Geologic/ Environmental Characterization Reports	---	---	5/83	---	1999	
Issue Draft Region-to-Area Screening Methodology	---	---	9/84	---	2000	
Issue Revised Draft Geologic/ Environmental Characterization Reports	---	12/84	12/84	---	---	
Issue Final Region-to-Area Screening Methodology	---	4/85	4/85	4/85	2001	
Issue Final Geologic/ Environmental Characterization Reports	---	7/85	7/85	9/85	2001	

(TABLE 6, cont'd.)

	<u>NWPA Requirement</u>	<u>FY 86 Bud.Req.</u>	<u>1985 MISSION PLAN</u>	<u>FY 87 Bud.Req.</u>	<u>If MISSION PLAN AMENDMENT</u>	
					<u>Approved</u>	<u>Not Approved</u>
Issue Draft Area Recommendation Report	---	11/85	1/86	1/86	2002	
Begin review of more than 60,000 comments received	---	---	---	---	---	10/87
Complete review of comments	---	---	---	---	2002	10/88
Issue Final Area Recommendation Report	---	5/85	5/86	11/86	2003	12/89
Issue Final Area Characterization Plan	---	9/86	12/86	11/87	2003	12/89
Begin area field investigations	---	9/86	12/86	11/87	2003	1990
Identify potentially acceptable sites	---	---	TBD	11/86	2003	1990
Complete area field investigations	---	---	1/90	---	2007	1994
Issue final environ- mental assessments	---	---	9/91	---	2007	1994
Nominate and recommend sites for characterization	7/1/89	7/91	10/91	1993	2007	1994
President approves recommended sites for characteri- zation	---	---	12/91	---	2007	1994

(TABLE 6, cont'd.)

	<u>NWPA Requirement</u>	<u>FY 86 Bud. Req.</u>	<u>1985 MISSION PLAN</u>	<u>FY 87 Bud. Req.</u>	<u>IF MISSION PLAN AMENDMENT</u>	
					<u>Approved</u>	<u>Not Approved</u>
Issue initial site characterization plans	---	---	1/93	---	2008	1995
Request Congressional approval for construction	---	---	6/93	---	2008	1995
Initiate Construction of Exploratory Shafts	---	---	6/93	---	2008	1995
Issue Final EIS	---	---	12/93	---	2016	2001
President recommends site to Congress	3/31/90	1997	3/98	1999	2016	2001
Site designation effective	---	---	5/98	---	2017	2002
Submit license application to NRC	---	1997	5/98	---	2017	2002
NRC issues Construction Authorization	---	1999	8/2000	---	2020	2005
Initiate 2nd repository construction	---	---	8/2000	---	2020	2005
NRC issues License for Operations	---	---	5/2006	---	2023	2010
Begin operations	---	---	6/2006	---	2023	2010



^(a)The precise nature of this document will be dependent on the provisions of any authorizing legislation.

^(b)The shipment of spent fuel to the MRS facility is contingent upon receipt of a construction authorization for the first repository. The revised schedule for the first repository in the Draft Mission Plan Amendment contemplates receipt of such authorization by the first quarter of 1998.

TABLE 7 - MRS Deployment Schedule

TABLE 8

NUCLEAR WASTE FUND

REVENUES AND EXPENDITURES
(Through March 31, 1987)

(Dollars in billions)

o	Revenues		
	- On-Going Fee	\$1.35	
	- One-Time Fee	1.44	
	- Interest Earned	<u>.25</u>	
	TOTAL Revenues	3.04	
o	Expended	<u>1.38</u>	
o	Amount Paid for Purchase of Investment Portfolio <u>1/</u>		1.66
o	Equipment Assets		<u>0.03</u>
	BALANCE		1.69

1/ The market value of a portfolio represents the proceeds that would be expected if the portfolio were to be liquidated at a point in time. As of March 31, 1987, the market value of the Nuclear Waste Fund portfolio was \$1.72 billion.



Department of Energy

Nevada Operations Office
P. O. Box 14100
Las Vegas, NV 89114-4100

MAY 21 1987

Distribution

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS PROJECT FISCAL YEAR (FY) 1987 AUDIT SCHEDULE, REVISION 2

Enclosed is Revision 2 of the Waste Management Project Office (WMPO) Quality Assurance Audit Schedule for FY 1987. This revised schedule reflects changes in proposed audits of Holmes & Narver, Inc., Science Applications International Corporation/Technical & Management Support Services, and U.S. Geological Survey. Firm dates will be coordinated and issued in audit notification letters two weeks prior to each audit.

Please provide the WMPO Project Quality Manager, James Blaylock (FTS 575-1125), with any changes or comments which require resolution.

A handwritten signature in cursive script that reads "Donald L. Vieth".

Donald L. Vieth, Director
Waste Management Project office

WMPO:JB-1750

Enclosure:
As stated

WMPO QA AUDIT SCHEDULE FOR FY 87, REV. 2

<u>Audit Number</u>	<u>Date*</u>	<u>Organization</u>	<u>Activities</u>	<u>Requirements</u>
87-1	3/30/87	Los Alamos	NNWSI Project	NVO-196-17, Los Alamos QAPP and Implementing Procedures
87-2	**September	H&N	NNWSI Project	NVO-196-17, H&N QAPP and Implementing QA Procedures and Design Control Procedures for ESF
87-3	4/27/87	LLNL	NNWSI Project	NVO-196-17, LLNL QAPP and Implementing QA and Technical Procedures
87-4	**June	SAIC/T&MSS	NNWSI Project	NVO-196-17, SAIC QAPP and Implementing QA Procedures
87-5	**June	SNL	NNWSI Project	NVO-196-17, SNL QAPP and Implementing Procedures
87-6	**August	USGS/Denver	NNWSI Project	NVO-196-17, USGS QAPP and Implementing QA Procedures
87-7	**August	USGS/Menlo Park	NNWSI Project	NVO-196-17, USGS QAPP and Implementing QA Procedures
87-8	July	F&S/Tulsa	NNWSI Project	NVO-196-17, F&S QAPP, Implementing QA Procedures and Design Control Procedures for ESF
87-9	July	F&S/LV	NNWSI Project	NVO-196-17, F&S QAPP and Implementing QA Procedures
87-10	August	REECco	NNWSI Project	NVO-196-17, REECco QAPP and Implementing QA Procedures
87-11	September	WMPO	NNWSI Project-	NVO-196-18, WMPO Implementing QA Procedures

*Firm dates will be coordinated and issued in the audit notification letter 14 days prior to the audit.

**Rescheduled since last issue.

DRAFT

DRAFT

PROPOSED MASTER CALENDAR
FOR DOE MEETINGS
INVOLVING STATES AND INDIAN TRIBES

MAY 28, 1987

DRAFT

KEY

ISCG- INSTITUTIONAL SOCIOECONOMIC COORDINATING GROUP

QUCG- QUALITY ASSURANCE COORDINATING GROUP

ECG- ENVIRONMENTAL COORDINATING GROUP

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TN/DOE- TENNESSEE/DOE

NAS/DOE- NATIONAL ACADEMY OF SCIENCES/DOE

* NEW COORDINATING GROUP

June 1987

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18 TN - DOE NASHVILLE, TN	19	20
21	22	23 <i>void</i> NRC - S/T RICHLAND, WA	24	25 <i>needed</i>	26	27
28	29	30				

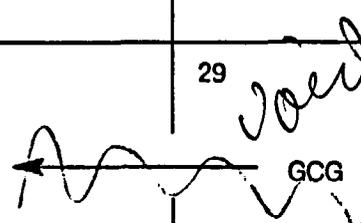
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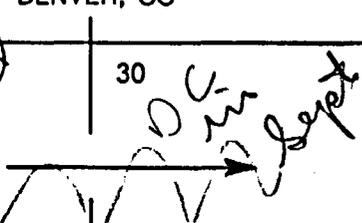
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July 1987

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8 NRC-S/T RICHLAND, WA	9	10	11
12	13	14	15 NAS/DOE SEATTLE, WA ISCG SEATTLE, WA	16	17	18
19	20	21	22	23 QACG DENVER, CO	24	25
26	27	28	29	30	31	

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August 1987

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5 P/RACG WASHINGTON, DC	6	7	8
9	10	11	12 NRC-S/T NEVADA (SITE)	13	14	15
16	17	18	19 NRC-S/T LAS VEGAS, NV	20	21	22
23	24	25	26 NRC-S/T WASHINGTON, DC	27 TCCG IDAHO FALLS, ID	28	29
30	31					

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September 1987

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

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← ECG WASHINGTON, DC →

GCG
WASHINGTON, DC

↗ Dallas
S/T
~~SEATTLE, WA~~

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October 1987

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7 NRC-S/T RICHLAND, WA	8	9	10
11	12	13	14 TCG DENVER, CO	15 PMCG WASHINGTON, DC	16	17
18	19	20	21	22 QACG AMARILLO, TX	23	24
25	26	27	28	29	30	31

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November 1987

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
				TCCG LAS VEGAS, NV		
15	16	17	18	19	20	21
			R/WPCG WASHINGTON, DC			
22	23	24	25	26	27	28
29	30					

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December 1987

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

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← ISCG LAS VEGAS, NV →

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January 1988

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31			S/T AMARILLO, TX			

← ECG LAS VEGAS, NV →

QACG
LAS VEGAS, NV

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February 1988

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 P/RACG RICHLAND, WA	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17 TCCG DENVER, CO	18	19	20
21	22	23	24	25	26	27
28	29					

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March 1988

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

← ISCG
AMARILLO, TX →

GCG
AMARILLO, TX

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April 1988

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19 PMCD WASHINGTON, DC	20	21 QACG ALBUQUERQUE, NM	22	23
24	25	26	27	28	29	30
31						

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MAY 1988

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
			← ECG WASHINGTON, DC →			
15	16	17	18	19	20	21
			← R/WPCG LAS VEGAS, NV →			
22	23	24	25	26	27	28
				S/T LAS VEGAS, NV		
29	30					

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SITE CHARACTERIZATION ACTIVITIES AND PLANS

Current and Near-Term Site Characterization Activities

LETTER REPORTS ISSUED FOR FEDERAL SITES

- **CONFORM WITH MAY 7-8, 1986 AGREEMENTS REACHED WITH NRC,
STATES, TRIBES**
- **IDENTIFY CONTINUING ACTIVITIES**
- **IDENTIFY NEW ACTIVITIES TO START BEFORE SCP ISSUED**
- **CORRELATE ONGOING ACTIVITIES WITH SCP PROGRAM**

CURRENT TECHNICAL ACTIVITIES

- **CONTINUING SOME SITE CHARACTERIZATION ACTIVITIES**
- **COMPILING, DOCUMENTING, AND ANALYZING EXISTING DATA**
- **DEVELOPING INITIAL DESIGNS**
 - **EXPLORATORY SHAFT FACILITY**
 - **REPOSITORY**
 - **WASTE PACKAGE**
- **DEVELOPING PERFORMANCE ASSESSMENT MODELS**
- **CONDUCTING SENSITIVITY ANALYSES**

CURRENT TECHNICAL STATUS

CON'T

- **DEVELOPING ISSUE-SPECIFIC RESOLUTION STRATEGIES**
- **DEVELOPING TESTING STRATEGIES**
- **DEVELOPING INFORMATION DOCUMENTATION SYSTEMS**

ONGOING SITE CHARACTERIZATION ACTIVITIES EXAMPLES

FIELD

- **DRILLING, LOGGING, MONITORING BOREHOLES**
- **EXCAVATING TRENCHES**
- **INSTALLING AND MONITORING SEISMIC NETWORKS**
- **INSTALLING AND MONITORING STREAM FLOW GAGES**
- **MONITORING PRECIPITATION**
- **CONDUCTING NATURAL ANALOG STUDIES**

ONGOING SITE CHARACTERIZATION ACTIVITIES EXAMPLES

LABORATORY

- **EVALUATING SEALING MATERIAL PROPERTIES**
- **TESTING THERMAL AND MECHANICAL PROPERTIES OF CORE SAMPLES**
- **ANALYZING GROUND WATER CHEMISTRY**
- **TESTING WASTE PACKAGE COMPONENT INTERACTIONS**

NNWSI PROJECT

EXAMPLES: ONGOING SITE CHARACTERIZATION ACTIVITIES

- **CONDUCTING HYDROLOGIC ACTIVITIES TO ESTABLISH MOISTURE CONDITIONS OF THE UNSATURATED ZONE**
- **COLLECTING SEISMIC DATA AND GEODETIC MEASUREMENTS TO DETERMINE TECTONIC SETTING**
- **COLLECTING METEOROLOGICAL DATA FOR REPOSITORY DESIGN STUDIES**
- **CONTINUING GEOCHEMICAL TESTING AND ANALYSIS TO PREDICT WASTE CONTAINER PERFORMANCE AND PREDICT RADIONUCLIDE RELEASE AND SORPTION RATES**

BWIP

EXAMPLES: ONGOING SITE CHARACTERIZATION ACTIVITIES

- **PLANNING AND PREPARING TO CONDUCT PRE-EXPLORATORY SHAFT HYDROLOGY TEST PROGRAM**
- **CONTINUING HYDROLOGIC MONITORING TO ESTABLISH GROUNDWATER LEVEL BASELINE**
- **CONDUCTING SEISMIC SURVEILLANCE TO PREDICT GROUND MOTION AT THE SITE**
- **CONTINUING GEOCHEMISTRY TESTING, INCLUDING NATURAL ANALOG TESTING AND GROUNDWATER SAMPLE ANALYSIS**

SALT REPOSITORY PROJECT

EXAMPLES: ONGOING SITE CHARACTERIZATION ACTIVITIES

- **CONTINUING MICROSEISMIC MONITORING TO EVALUATE REGIONAL SEISMICITY**
- **CONTINUING WASTE PACKAGE MATERIALS TESTING TO AID IN DESIGN SELECTION**
- **CONTINUING PERFORMANCE ASSESSMENT CODE DEVELOPMENT**

STATUS AND SCHEDULE FOR SCP PRODUCTION

STATUS OF SCP PRODUCTION

NNWSI—

- CHAPTERS 1-7 REVISED AND INFORMATION COPIES DISTRIBUTED TO STATES/TRIBES/NRC
- CHAPTER 8 BEING COMPLETED
- TEXT BEING FROZEN IN PREPARATION FOR ASSEMBLED DOCUMENT REVIEW MAY 22 - JUNE 5
- TARGET ISSUANCE: AUGUST 1987

STATUS OF SCP PRODUCTION

BWIP—

- **CHAPTERS 1-5 REVISED AND INFORMATION COPIES DISTRIBUTED TO STATES/TRIBES/NRC**
- **CHAPTERS 6, 7, 8 BEING COMPLETED**
- **ASSEMBLED DOCUMENT REVIEW SCHEDULED FOR JULY 3-17**
- **TARGET ISSUANCE: OCTOBER 1987**

STATUS OF SCP PRODUCTION

SRP—

- PREPARATION OF SCP INITIATED DECEMBER 1986
- SCP "STORYBOARD" COMPLETED MARCH 1987
- CHAPTERS 1, 2, 3, 4, 7, 8 IN PREPARATION
- CHAPTERS 5, 6 ARE IN INITIAL REVIEW CYCLE
- STATE HAS RECEIVED "STORYBOARD"
- ON-SITE REVIEWS SCHEDULED TO BEGIN EARLY JUNE, 1987
- TARGET ISSUANCE: SPRING 1988

GENERIC SCHEDULE FOR SCP PREPARATION AND ISSUANCE

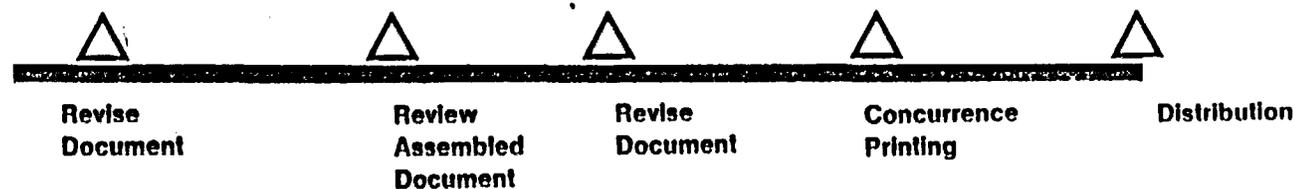
1987

MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
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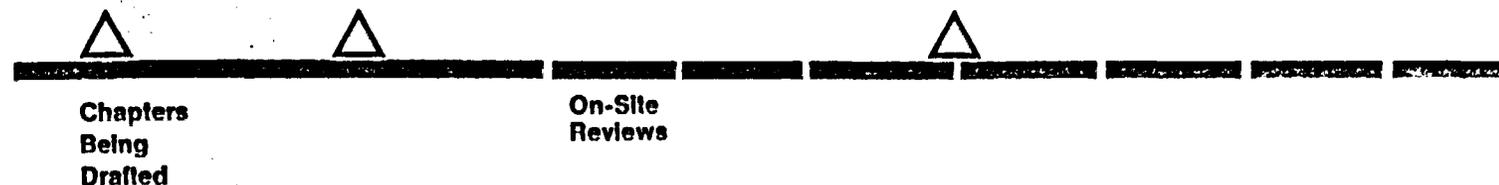
NNWSI



BWIP



SRP



NNWSI SCP SCHEDULE

1. HQ REVIEW OF SECTION 8.3, HQ/PO WORKSHOP 2/17 - 3/6
2. PO REVISE SECTION 8.3, PREPARE SECTION 8.2 3/6 - 5/1
MEETINGS ON CRITICAL PATH ITEMS:
 - a) WASTE PACKAGE
 - b) TECTONICS
 - c) INTEGRATION OF PERFORMANCE ASSESSMENT AND CHARACTERIZATION
 - d) INTEGRATION OF REPOSITORY DESIGN AND CHARACTERIZATION
3. PO PRODUCE SCP FOR ASSEMBLED REVIEW 5/1 - 5/22
 - a) EDIT
 - b) WORD PROCESS
 - c) PRINT
4. HQ REVIEW OF ASSEMBLED SCP 5/22 - 6/5
 - HQ REVIEW
 - PO INTEGRATION REVIEW
5. HQ/PO WORKSHOP 6/5 - 6/19
6. PO REVISE SCP FOR CONCURRENCE 6/19 - 7/10
 - a) REVISE
 - b) EDIT
 - c) PRODUCE
7. PO CONCURRENCE 7/10 - 7/17
8. HQ CONCURRENCE 7/17 - 7/24
9. PO PREPARE CAMERA-READY COPY 7/24 - 7/31
10. PO PRINT/DISTRIBUTE 7/31 - 8/21

BWIP SCP SCHEDULE

1. HQ REVIEW OF SECTION 8.2, 8.3
 - a) HQ REVIEW 4/6 - 4/17
 - b) HQ/PO WORKSHOP 4/17 - 5/8
2. PO REVISE SECTION 8.2, 8.3 5/8 - 6/12
CRITICAL PATH ITEMS:
 - a) WASTE PACKAGE
 - b) HYDROLOGY
3. PO PRODUCE SCP FOR ASSEMBLED REVIEW 6/12 - 7/3
 - a) EDIT
 - b) WORD PROCESS
 - c) PRINT
4. HQ REVIEW OF ASSEMBLED SCP 7/3 - 7/17
5. HQ/PO WORKSHOP 7/17 - 7/31
6. PO REVISE SCP FOR CONCURRENCE 7/31 - 9/4
 - a) REVISE
 - b) EDIT
 - c) PRODUCE
7. PO CONCURRENCE 9/4-9/11
8. HQ CONCURRENCE 9/11-9/18
9. PO PREPARE CAMERA-READY COPY 9/18-9/25
10. PO PRINT/DISTRIBUTE 9/25-10/16

DISTRIBUTION OF INFORMATION COPIES OF DRAFT SCP CHAPTERS

<u>PROJECT</u>	<u>CHAPTERS</u>	<u>EXPECTED DATE</u>
BWIP	1, 2, 4, 5	DISTRIBUTED
	3	DISTRIBUTED
	6, 7	JUNE '87
	8	JULY '87
NNWSI	1-7	DISTRIBUTED
	8	JULY '87
SRP	1-7	LATE '87
	8	EARLY '88

TECHNICAL CONTENTS

SECTION 8.3 — PLANNED INVESTIGATIONS

8.3.1 SITE PROGRAM

8.3.2 REPOSITORY PROGRAM

8.3.3 SEAL SYSTEM PROGRAM

8.3.4 WASTE PACKAGE PROGRAM

8.3.5 PERFORMANCE ASSESSMENT PROGRAM

**PLANS FOR SITE CHARACTERIZATION ACTIVITIES PRIMARILY IN
SECTION 8.3.1**

SECTION 8.3.1

NNWSI — YUCCA MOUNTAIN SITE

SPECIFIC PROGRAM (example)

GEOHYDROLOGY

GEOCHEMISTRY

ROCK CHARACTERISTICS

INVESTIGATIONS (example)

- REGIONAL HYDROLOGIC SYSTEM
- UNSATURATED ZONE HYDROLOGIC SYSTEM AT SITE
- SATURATED ZONE HYDROLOGIC SYSTEM AT SITE
- WATER CHEMISTRY
- MINERALOGY, PETROLOGY, ROCK CHEMISTRY
- STABILITY OF MINERALS AND GLASSES
- RADIONUCLIDE RETARDATION BY SORPTION
- RADIONUCLIDE RETARDATION BY PRECIPITATION
- RADIONUCLIDE RETARDATION BY DISPERSIVE, DIFFUSIVE, ADVECTIVE TRANSPORT
- STRATIGRAPHY AND STRUCTURE
- THERMAL AND MECHANICAL PROPERTIES
- AMBIENT STRESS AND THERMAL CONDITIONS

SECTION 8.3.1

NNWSI — YUCCA MOUNTAIN SITE (cont'd)

SPECIFIC PROGRAM **(examples)**

INVESTIGATIONS **(examples)**

EROSION

— LOCATIONS AND RATES OF SURFACE EROSION

TECTONICS (POSTCLOSURE)

— POTENTIAL IGNEOUS ACTIVITY

— FAULTING, FOLDING, UPLIFT AND SUBSIDENCE, AND SEISMIC ACTIVITY

HUMAN INTERFERENCE

— ENERGY, MINERAL, LAND, AND GROUND WATER RESOURCES

SURFACE CHARACTERISTICS

— TOPOGRAPHY

— SOIL AND BEDROCK PROPERTIES

— METEOROLOGY

HYDROLOGY

— SURFACE FLOODING

— WATER SUPPLIES

TECTONICS (PRECLOSURE)

— VOLCANIC ACTIVITY AFFECTING DESIGN

— FAULT DISPLACEMENT AFFECTING DESIGN

— VIBRATORY GROUND MOTION AFFECTING DESIGN

— TECTONICS DATA COLLECTION AND ANALYSIS

NNWSI

(EXAMPLE) INVESTIGATION: TECTONICS DATA COLLECTION AND ANALYSIS

STUDIES (examples)

HISTORICAL AND CURRENT
SEISMICITY

FAULTING POTENTIAL
AT LOCATION OF
SURFACE FACILITIES

QUATERNARY FAULTING
WITHIN 100km

TESTS AND ANALYSES (examples)

- COMPILATION OF EARTHQUAKE RECORD
- MONITORING CURRENT SEISMICITY
- EVALUATION OF HUMAN ACTIVITIES

- TRENCHING IN MIDWAY VALLEY

- EVALUATION OF FURNACE CREEK FAULT ZONE, YUCCA MOUNTAIN, AND THE WALKER LANE
- EVALUATION OF QUATERNARY FAULTS WITHIN 100km OF YUCCA MOUNTAIN
- EVALUATION OF THE BARE MOUNTAIN FAULT ZONE
- EVALUATION OF STRUCTURAL DOMAINS, REGIONAL PATTERNS OF FAULTS AND FRACTURES

NNWSI

(EXAMPLE)

INVESTIGATION: TECTONICS DATA COLLECTION AND ANALYSIS (cont.)

STUDIES (examples)

SUBSURFACE GEOMETRY
AND CONCEALED
EXTENSIONS OF
QUATERNARY FAULTS

TESTS AND ANALYSES (examples)

- EVALUATION OF INTERMEDIATE-DEPTH SEISMIC REFLECTION AND REFRACTION METHODS
- GRAVITY SURVEY OF SITE AREA
- AEROMAGNETIC SURVEY OF SITE AREA
- GROUND MAGNETIC SURVEY OF SITE AREA

SECTION 8.3.1

BWIP — HANFORD SITE

SPECIFIC PROGRAM

INVESTIGATIONS (EXAMPLES)

GEOLOGY

- STRATIGRAPHIC AND STRUCTURAL MODEL DEVELOPMENT
- MINERALOGIC AND PETROLOGIC CHARACTERIZATION
- TECTONIC EVENTS AND PROCESSES

HYDROLOGY

- SURFACE WATER
- GROUND WATER

GEOCHEMISTRY

- HYDROCHEMISTRY
- RADIONUCLIDE RETARDATION

CLIMATOLOGY

- PAST CLIMATE
- FUTURE CLIMATE
- METEOROLOGY

RESOURCE POTENTIAL

- MINERAL RESOURCE POTENTIAL
- WATER RESOURCE POTENTIAL

BWIP

EXAMPLE INVESTIGATION: GROUND WATER

STUDIES

REGIONAL GROUNDWATER

TESTS AND ANALYSES (examples)

- HYDRAULIC TESTING OF REGIONAL BOREHOLES
- GEOPHYSICAL LOGGING OF REGIONAL BOREHOLES
- HYDRAULIC TESTING OF FAULT AND FOLD FEATURES
- DEVELOPMENT OF REGIONAL GROUNDWATER DATA BASE
- DEVELOPMENT OF CONCEPTUAL MODEL OF GROUNDWATER FLOW SYSTEM
- NUMERICAL SIMULATION PASCO BASIN AND COLD CREEK SYNCLINE FLOW SYSTEMS
- SENSITIVITY ANALYSIS OF SYSTEM TO NATURAL AND MAN INDUCED CHANGES
- DETERMINATION OF GROUNDWATER USE PATTERNS

BWIP

EXAMPLE INVESTIGATION: GROUND WATER

STUDIES

SITE GROUNDWATER

TESTS AND ANALYSES (examples)

- BASELINE HYDRAULIC HEAD TESTING
- LARGE-SCALE HYDRAULIC STRESS TESTING
- TRACER TESTING
- SMALL SCALE HYDRAULIC STRESS TESTING
- DRILLING FLUID INVASION
- SINGLE BOREHOLE TESTS FROM UNDERGROUND FACILITY
- CLUSTER HYDRAULIC TESTS FROM UNDERGROUND FACILITY
- CLUSTER TRACER TESTS FROM UNDERGROUND FACILITY
- CHAMBER (VENTILATION) TEST

BWIP

EXAMPLE INVESTIGATION: GROUND WATER (CONT'D)

STUDY

SITE GROUNDWATER (cont.)

TESTS AND ANALYSES (examples)

- FORMULATION OF CONCEPTUAL MODELS OF SITE FLOW SYSTEM**
- NUMERICAL SIMULATION OF SITE FLOW SYSTEM**
- SENSITIVITY ANALYSIS OF SITE MODEL TO COMPONENT PARAMETERS**
- ANALYSIS OF FIELD DATA USING NUMERICAL METHODS**

RESPONSE TO COMMENTS

PREVIOUS COMMENTS

- COMMENTS FROM NRC ON THE EA

- COMMENTS FROM SCP SCOPING HEARING
 - HANDLED BY A MATRIX CORRELATING COMMENTS TO THE ISSUES AND ISSUE RESOLUTION STRATEGY IN 8.2

TRACKING OF NRC EA COMMENTS IN SCP

HANFORD

<u>NRC DRAFT EA MAJOR COMMENT</u>	<u>NRC FINAL EA COMMENT ON RESOLUTION</u>	<u>DOE TRACKING OF NRC COMMENT</u>	<u>REFERENCE</u>
1. Groundwater travel time	Groundwater travel time No. 5* (data base adequacy, models, flow path)	Address in site characterization, large-scale hydrologic stress tests.	SCP 8.3.1.3
2. Changes that could affect the geohydrologic regime	No major concern		
3. Geochemical environment	Redox conditions No. 6* (insufficient data)	DOE recognizes need to determine redox state of radionuclides, geochemistry program will address this.	Final EA pg. C.5-87 SCP 8.3.1.4
	Microbial/Organic Complexes and Radionuclide Retardation (new comment based on new information) No. 7* (increased mobility)	Analysis of and testing with site specific groundwater during site characterization will evaluate organic complexing and mobility effects.	SCP 8.3.1.4
4. Tectonic stability	Potential fault activity No. 2* (breccia, geophysical anomalies, microseismic activity)	Final EA text did not require revision. Additional data during site characterization will enhance interpretation.	Final EA C.5-129, 135, 156 SCP 1.3, 8.3
	Rate and style of deformation No. 3* (alternate interpretation - higher rate, episodic)	Final EA text did not require revision. Additional data during site characterization will enhance interpretation.	Final EA C.5-167 SCP 1.3, 8.3
	Seismicity No. 4* (microearthquake hazards)	High quality downhole seismometers installed, study earthquake swarms and associated phenomena during site characterization.	Final EA pg. C.5-148, 150 SCP 1.4.1.4, 5 and 8.3.1
5. Natural resources	No major concern		
	Potential geothermal resources (new comment based on new information) No. 1*	New information should be verified by BWIP and referenced regarding potential geothermal resources.	Should appear in SCP 1.7 or 8.3.1.6
6. Thickness of host rock	No major concern		
7. Shaft construction	No major concern		
8. Waste package lifetime	Waste package lifetime No. 8* (oxidizing environment, effect of packing)	DOE recognizes problem with demonstrating container performance and is designing the testing program during site characterization to reduce uncertainties.	SCP 8.3.4.2, and 5
9. Surface flooding	No major concerns		
10. Comparative evaluation of sites	No major concerns		

*Final EA comment number.

TRACKING OF NRC EA COMMENTS IN SCP

YUCCA MOUNTAIN

<u>NRC DRAFT EA MAJOR COMMENT</u>	<u>NRC FINAL EA COMMENT ON RESOLUTION</u>	<u>DOE TRACKING OF NRC COMMENT</u>	<u>REFERENCE</u>
1. Fault activity	Fault activity NRC No. 1* (potentially active)	Fault activity studies are on-going, SCP includes studies to address this concern.	SCP 1.3.2.2, 8.3.1.8, 8.3.1.17
	Northeast trending faults No. 2* (nature and rate of movement)	Northeast trending fault investigations are on-going, SCP includes studies to address this concern.	SCP 1.3.2.2, 8.3.1.8, 8.3.1.17
	Detachment faulting No. 3* (possible presence, implications)	Detachment faulting investigations are on-going, SCP includes studies to address this concern.	SCP 1.3.2.2, 8.3.1.8, 8.3.1.17
2. Volcanism/hydrothermal activity	Hydrothermal activity No. 4* (origin calcite/silica vein deposits)	SCP will include studies to determine origin and age of calcite/silica deposits, and assess hydrothermal implications.	Final EA C-5-42 SCP 1.3.2.1, 8.3.1.8.1
	Natural resource data relevant to the evaluation No. 5* (undiscovered mineral resources)	DOE is aware of this concern, NMWSI should revise SCP to address undiscovered mineral resources.	Should appear in SCP 1.7, 8.3.1.9.2
3. Groundwater travel time calculations	Groundwater travel time No. 7* (uncertainties, alternative models)	SCP hydrologic studies will attempt to remove these uncertainties.	SCP 8.3.1.2
4. Free drainage of host rock	No major concerns		
5. Groundwater chemistry of the unsaturated zone	No major concerns		
6. Retardation of radionuclides	Retardation of radionuclides No. 8*	SCP hydrology plans center on understanding flow mechanisms and rates, SCP geochemistry plans will address retardation.	SCP 8.3.1.3
7. Mineral stability	No major concerns		
8. Radionuclide transport increase due to changes in geohydrologic and climatic conditions	Radionuclide transport increase due to changes in geohydrologic and climatic conditions No. 6* (geochemical retardation)	Studies during site characterization will address projected flow rate changes due to climatic conditions.	SCP 4.1.3, 8.3.1.3, 8.3.1.5, 8.3.5.13
9. Surface flooding	No major concerns		
10. Waste package postclosure performance	Waste package postclosure performance No. 9*	DOE is presently developing a waste package performance objective compliance strategy. A detailed materials program is planned during site characterization.	SCP 8.3.4.1.4, 8.3.5.9
11. Comparative evaluation of sites	No major concerns		

*Final EA comment number.

TRACKING OF NRC EA COMMENTS IN SCP

DEAF SMITH

<u>NRC DRAFT EA MAJOR COMMENT</u>	<u>NRC FINAL EA COMMENT ON RESOLUTION</u>	<u>DOE TRACKING OF NRC COMMENT</u>	<u>REFERENCE</u>
1. Structural discontinuities	Dissolution No. 1* (through-going fractures, playas, interior dissolution)	SCP studies include drilling to check for dissolution under the High Plains.	SCP 8.3.1.3
2. Dissolution	Dissolution No. 1* (through-going fractures, playas, interior dissolution)	SCP studies include drilling to check for dissolution under the High Plains.	SCP 8.3.1.3
3. Groundwater travel time	Groundwater travel time No. 2* (model, flow path, gradients, porosity)	SRPO will use CFEST hydrogeologic flow model not PTRACK.	SCP 8.3.1.3
4. Host rock clay content and dehydration	No major concerns		
5. Radionuclide mobility	Redox conditions No. 3* (mobility of redox-sensitive radionuclides)	NRC comment is theoretical. Isolation of salt from groundwater intrusion argues there will be no significant radionuclide migration. Site characterization studies will address redox speciation.	SCP 8.3.1.4
6. Effects of host rock mass heterogeneity	Effects of host rock mass heterogeneity No. 4* (thermal, mechanical effects)	Statements on heterogeneities concern in situ rock and can not be addressed until site characterization.	SCP 8.3.2.3
7. Retrievability	No major concerns		
8. Shaft sealing	Shaft sealing No. 5* (ground freeze-thaw and seals)	SRPO plans to install and observe seals during site characterization, shaft seals considered a construction concern.	SRPO In Situ Test Plan March 1985, SCP-CDR 5.2, Final EA Sec. 4.1.2
9. Waste package performance predictions	Waste package performance predictions No. 6* (BRINEMIG model deficiency)	DOE is developing improved models to predict brine migration and testing programs to quantify corrosion mechanisms and rates.	SCP 8.3.1.4, 8.3.4
10. Controlled area	No major concerns		
11. Surface flooding	No major concerns		
12. Comparative evaluation of sites	No major concerns		

*Final EA comment number.

FUTURE COMMENTS

- **COMMENTS RELATED TO EXPLORATORY SHAFT EVALUATED AT END OF 90-DAY PUBLIC COMMENT PERIOD AND ADDRESSED PRIOR TO START OF EXPLORATORY SHAFT**
- **OTHER COMMENTS ADDRESSED IN SEPARATE COMMENT RESPONSE DOCUMENT PREPARED BY PROJECT OFFICE AND REFLECTED AS APPROPRIATE IN SEMI-ANNUAL PROGRESS REPORTS**

NRC DRAFT EA MAJOR COMMENT

1. Groundwater travel time

NRC FINAL EA COMMENT ON RESOLUTION

Groundwater travel time No. 5*
(data base adequacy, models, flow
path)

DOE TRACKING OF NRC COMMENT

Address in site characterization,
large-scale hydrologic stress
test, specifically five areas,
1) applicability of previously
published travel time estimates;
2) reliability of the data base for
transmissivity, hydraulic gradient,
and effective thickness;
3) treatment of these data in
deterministic and stochastic models;
4) treatment of numerical model
geometry; and
5) orientations and lengths of flow paths
(i.e., conceptual groundwater flow
models) from the disturbed zone to
the accessible environment.

REFERENCE

SCP 8.3.1.3

* Final EA comment number.

NRC DRAFT EA MAJOR COMMENT

2. Changes that could affect
the geohydrologic regime*

3. Geochemical environment

NRC FINAL EA COMMENT ON RESOLUTION

Redox conditions No. 6**
(insufficient data)

Microbial/Organic Complexes and
Radionuclide Retardation
(new comment based on new
information) No. 7**
(increased mobility)

DOE TRACKING OF NRC COMMENT

DOE recognizes need to determine
redox state of radionuclides,
geochemistry program will address
this.

Analysis of and testing with site
specific groundwater during site
characterization will evaluate
organic complexing and mobility
effects.

REFERENCE

Final EA pg.
C.5-87
SCP 8.3.1.4

SCP 8.3.1.4

* No major NRC concern with final EA resolution.

** Final EA comment number.

NRC DRAFT EA MAJOR COMMENT

4. Tectonic stability

NRC FINAL EA COMMENT ON RESOLUTION

Potential fault activity No. 2*
(breccia, geophysical anomalies
microseismic activity)

Rate and style of deformation No. 3*
(alternate interpretation-higher
rate, episodic)

Seismicity No. 4*
(microearthquake hazards)

DOE TRACKING OF NRC COMMENT

Final EA text did not require
revision. Additional data
during site characterization
will enhance interpretation.

Final EA text did not require
revision. Additional data
during site characterization
will enhance interpretation.

High quality downhole seismometers
installed, study earthquake swarms
and associated phenomena during
site characterization.

REFERENCE

Final EA C-5-
129, 135, 156
SCP 1.3, 8.3

Final EA C.5-
167, SCP 1.3,
8.3

Final EA pg.
C.5-148, 150
SCP 1.4.1.4, &
8.3.1

* Final EA comment number.



Department of Energy

Nevada Operations Office

P. O. Box 14100

Las Vegas, NV 89114-4100

MAY 22 1987



Paul T. Prestholt
Nuclear Regulatory Commission
1050 E. Flamingo, Suite 319
Las Vegas, NV 89109

PEER REVIEW ON CALCITE AND OPALINE SILICA DEPOSITS LOCATED ALONG FAULTS NEAR YUCCA MOUNTAIN

This letter is the formal follow-up to the previous telephone call from Steve Mattson, Science Applications International Corporation (SAIC), to inform you of the planned peer review concerning the calcite and opaline silica deposits located along faults near Yucca Mountain. After extensive coordination efforts with all peer reviewers, the meeting is planned for May 27-29, 1987. We would like to invite you to the field trip and the review meeting. The first day, May 27, 1987, will consist of a field trip to the Yucca Mountain area to view the deposits, and will begin at the core library facility, Mercury, Nevada Test Site, at 8:30 a.m. Please make any necessary arrangements for attending the field trip if you plan to attend. The second and third day of the meeting will be conducted at Science Applications International Corporation beginning at 8 a.m. in Room 450. A proposed agenda is enclosed for your information (enclosure I).

We are requesting that your organization limit its attendance to a single representative at the meeting and field trip. This will allow the meeting and field trip to be of manageable size and to be conducted in an efficient, interactive, professional, and timely manner. It is necessary to hold the attendance down to a small group so as not to interfere with maintaining effective communications with the peer review members.

If you have any questions or concerns, please feel free to contact Maxwell Blanchard (702) 295-1091 or myself (702) 295-3662.


Donald L. Vieth, Director
Waste Management Project Office

WMPO:MBB-1781

Enclosure:
As stated

- cc w/encl:
- V. J. Cassella, HQ (RW-222), FORS
- S. R. Mattson, SAIC, Las Vegas, NV
- M. E. Spaeth, SAIC, Las Vegas, NV
- M. D. Voegele, SAIC, Las Vegas, NV
- D. E. Livingston, WMPO, NV
- M. B. Blanchard, WMPO, NV

AGENDA: Calcite and Opaline Silica Deposits Peer Review

Wednesday May 27: FIELD TRIP TO YUCCA MOUNTAIN

- 5:45 a.m. Vans leave from DOE parking lot and from Paddlewheel Hotel
- 7:00 a.m. Arrive at Mercury, Nevada Test Site for badge check in.
- 7:20 a.m. Quick breakfast at Mercury cafeteria.
- 8:00 a.m. Meet at Core Library Facility. A brief meeting will be held to discuss locations being visited.
- 8:30 a.m. Leave for Yucca Mountain area.
- 9:15 a.m. Soil deposits on the eastern side of Yucca Mountain.
- 10:15 a.m. Trench 14.
- 12:00 noon Lunch.
- 1:15 p.m. Trench 17
- 2:30 p.m. Sand Ramps at Busted Butte.
- 3:30 p.m. If time permits an additional stop will be made.
- 4:15 p.m. Leave for Mercury.
- 5:00 p.m. Leave from Core Library Facility for Las Vegas.
- 6:15 p.m. Arrive in Las Vegas. End of Day 1.

Thursday May 28: PRESENTATIONS

- 8:00 a.m. Introduction to Peer Review Meeting (WMPD/DOE).
- 8:30 a.m. Background information on licensing and regulatory concerns (SAIC).
- 9:00 a.m. Review of research proposed (USGS).
- 11:15 a.m. Lunch.
- 12:15 p.m. Review of research proposed (LANL).
- 2:15 p.m. Performance Assessment (Sandia National Laboratory).
- 4:00 p.m. Review of charter to peer reviewers and discussion.
- 5:30 p.m. End of Day 2

ENCLOSURE

Friday May 29: PEER REVIEWER DISCUSSIONS, RECOMMENDATIONS, AND TOPICS FOR FURTHER REVIEW

- 8:00 a.m. Opening discussions: From the direction given in the charter and the direction derived from this meeting the peer reviewers will hold discussions and make recommendations to the NNWSI Project. If necessary, the peer reviewers will discuss what can realistically be accomplished today and what will have to be considered in the next few days or weeks. This information will be collated by the chairman and sent to the DOE/WMPD office. A desirable outcome of today's meeting is to finalize the recommendations that the peer reviewers agree upon and, if necessary, define in detail what each peer reviewer is responsible to provide to the chairman by a specified date.
- 10:00 a.m. Closed session meeting: Peer panel, SAIC, and WMPD personnel only.
- 11:30 a.m. Lunch
- 12:45 p.m. Continue closed session meeting.
- 3:30 p.m. Open session meeting: Report on findings and recommendations of peer review to be formalized and submitted to DOE from the chairman.

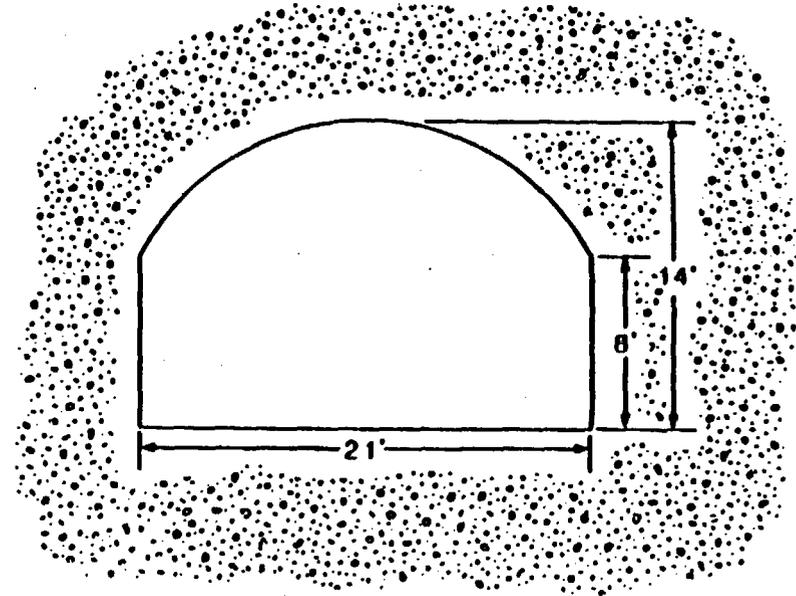
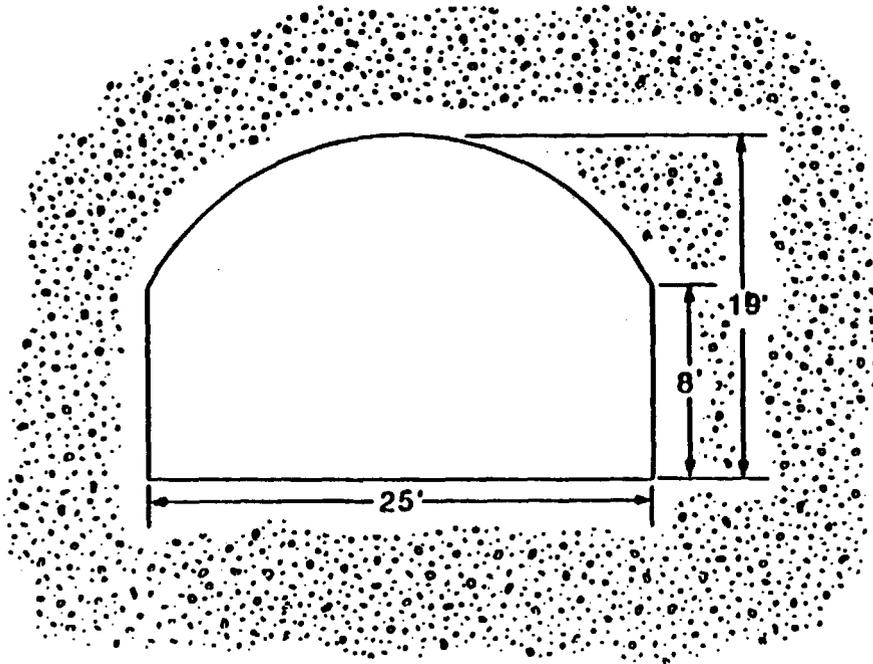
U.S. DEPARTMENT OF ENERGY

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Nevada
Wuclear
Site
Insights
PROJECT

YUCCA MOUNTAIN

EXPLORATORY DRIFT SIZE



U.S. DEPARTMENT OF ENERGY

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PROJECT

YUCCA
MOUNTAIN

DISCOVERY

● ROUND ONE

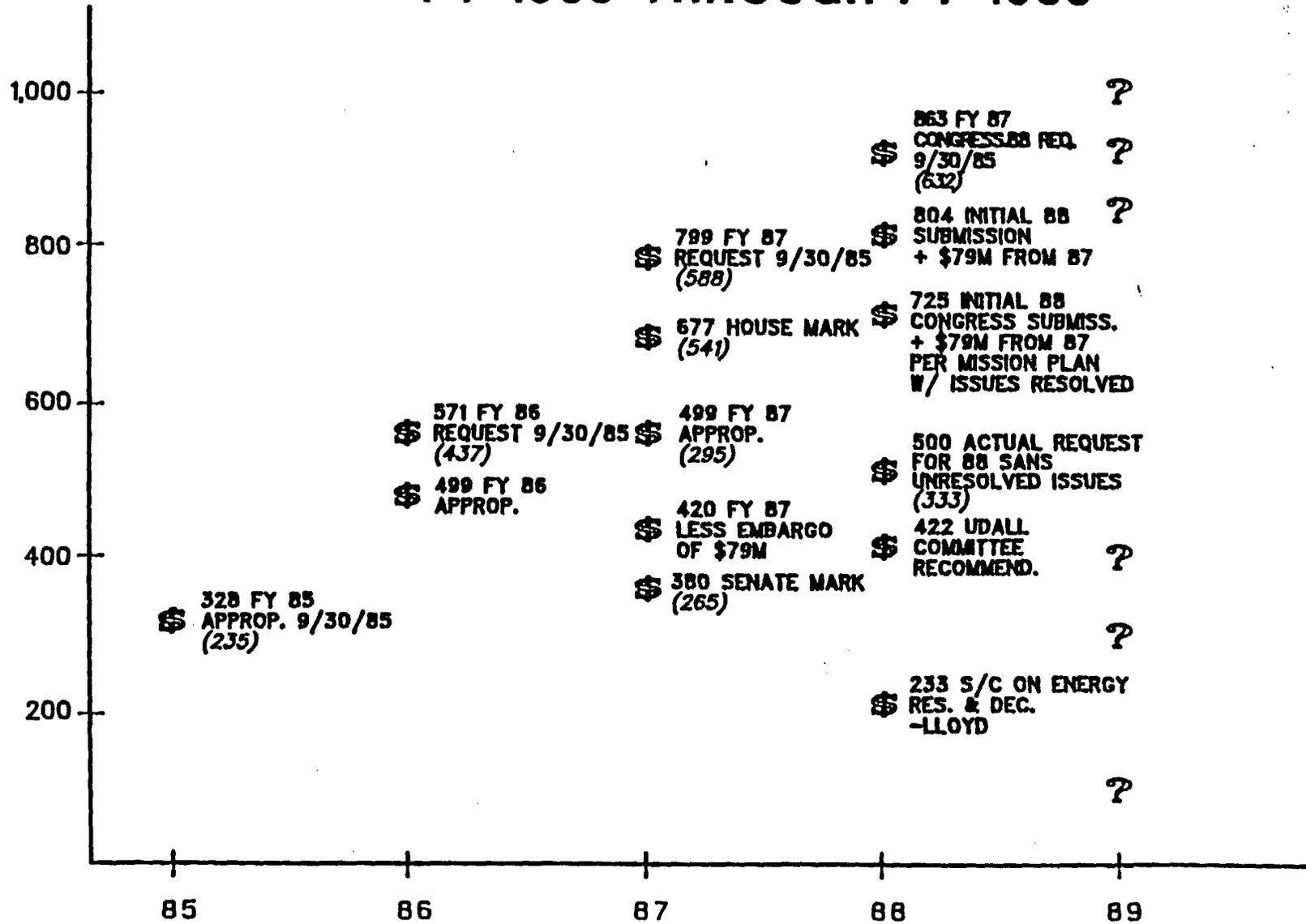
- REQUEST DATE: MAY 5; VISIT DATE: MAY 6-7
- 151 DOCUMENTS REQUESTED
- 145 RETRIEVED
- 105 TAKEN BY STATE'S LAWYERS

● ROUND TWO

- REQUEST DATE: MAY 14; VISIT DATE: MAY 19
- 564 DOCUMENTS REQUESTED
- ? RETRIEVED (BY FRIDAY MAY 15 COB, 534 RETRIEVED)
- ? TAKEN BY STATE'S LAWYERS

\$ Millions

OCRWM BUDGET TARGETS FY 1985 THROUGH FY 1988



(FIRST REPOSITORY TARGETS AS A PORTION OF THE OCRWM TOTAL)

U.S. DEPARTMENT OF ENERGY

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Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

OGR

FY 1988 BUDGET CONTINGENCIES

REFERENCE CASE

\$725 M

CONTINGENCY ALTERNATIVES

\$500 M + 73 M

\$500 M

\$420 M

U.S. DEPARTMENT OF ENERGY

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Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

VUCCA
MOUNTAIN

WMPO-LEVEL OF ACTIVITY

(FIRST 6 MONTHS OF FISCAL YEAR)
(OCT 1 TO MAR 31)

OGR

	FY 85	FY 86	FY 87
ACTION ITEMS	924	1085	1350
ACTION ITEMS RETIRED	703	955	1197
INCOMING CORRESPONDENCE	1974	3415	4138
OUTGOING CORRESPONDENCE	433	1056	1548

STATUS OF STUDY PLAN LIST

- REVISED TO BE CONSISTENT WITH SCP CHAPTER 8

- TOTAL OF 106 STUDY PLANS
 - 5 EXPLORATORY SHAFT CONSTRUCTION PHASE
 - 33 ONGOING
 - 33 FIRST YEAR
 - 35 SECOND YEAR AND BEYOND

PRELIMINARY STUDY PLAN SCHEDULE

• ASSUMPTIONS:

- FOCUS ON ES CONSTRUCTION PHASE, ONGOING, AND HIGH PRIORITY FIRST YEAR STUDIES
- FOCUS ON REALISTIC LEVEL OF EFFORT
- FOLLOW HQ GUIDANCE WHICH PROVIDES FLEXIBILITY
- ORGANIZE REVIEWS IN PARALLEL WITH HQ REVIEW

HQ GUIDANCE ON STUDY PLAN SCHEDULE

• ES CONSTRUCTION PHASE

- RELEASE WITH SCP
- TO HQ BY 7/3/87

• ONGOING

- AS MANY AS POSSIBLE WITH SCP
- AS MANY AS POSSIBLE TO HQ BY 7/3/87

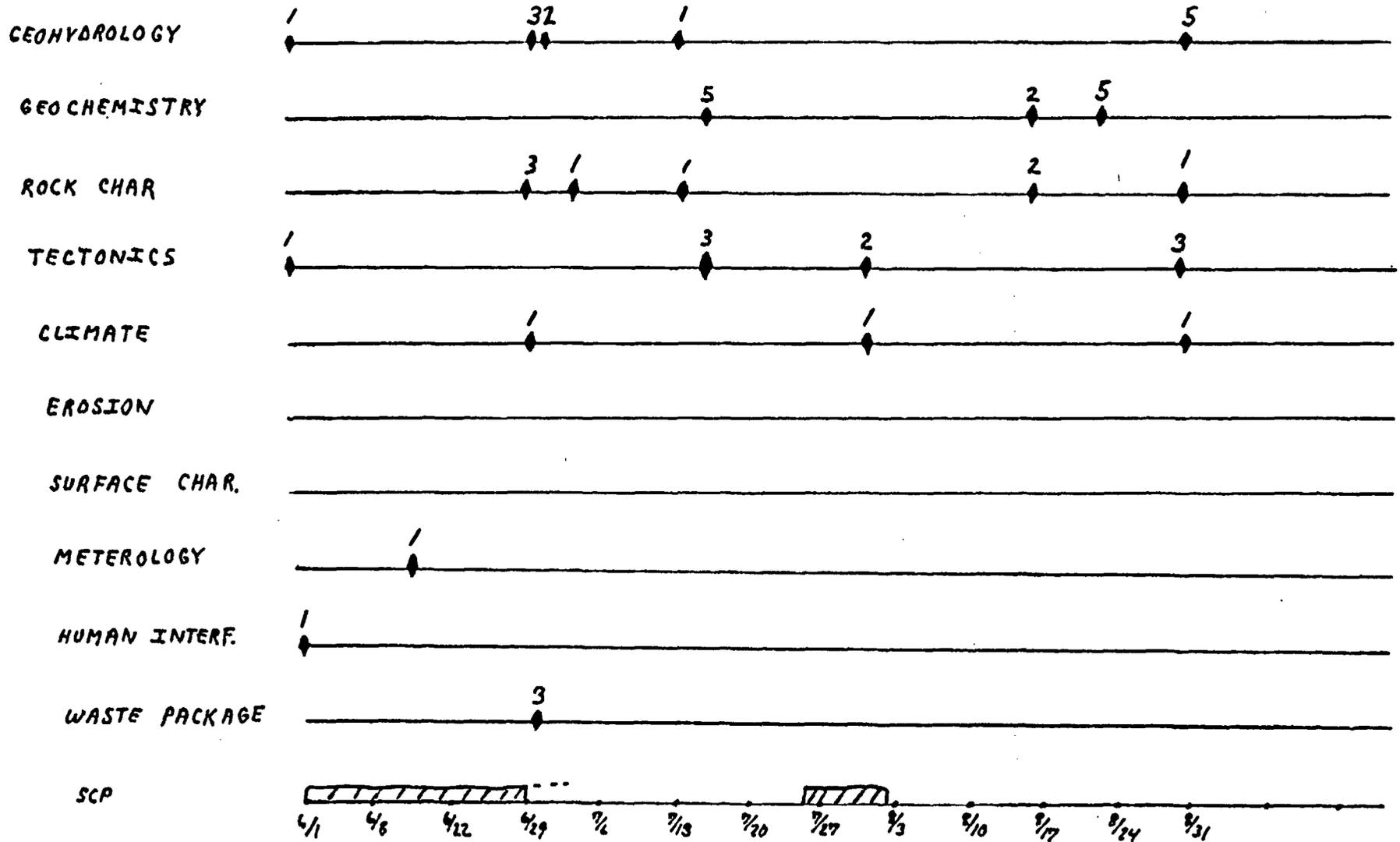
• FIRST YEAR

- TO THE EXTENT PRACTICABLE WITH SCP
- TO THE EXTENT PRACTICABLE TO HQ BY 7/3/87

5/20/87 TPO MEETING

SCHEDULE FOR STUDY PLAN

SUBMITTAL TO WMPD THROUGH 8/31/87



SCHEDULE FOR ES CONSTRUCTION
PHASE STUDY PLANS

- EXCAVATION INVESTIGATIONS TO HQ 5/1/87
- CHARACTERIZATION OF STRUCTURAL FEATURES WITHIN THE SITE AREA TO WMPO 6/30/87
- CHARACTERIZATION OF PERCOLATION IN THE UNSATURATED ZONE - ESF INVESTIGATIONS TO WMPO 6/30/87
- WATER MOVEMENT TRACER TESTS TO WMPO 7/1/87
- CHARACTERIZATION OF SITE AMBIENT STRESS CONDITIONS TO WMPO 6/30/87

5/20/87 TPO MEETING

SCHEDULE FOR ONGOING AND FIRST
YEAR STUDY PLANS THROUGH 8/31/87

• ONGOING (33) STUDY PLANS

~ 25% (8) TO HQ BY 7/3/87

~ 50% (16) TO HQ BY 7/12/87

~ 95% (31) TO HQ BY 9/1/87

• FIRST YEAR (33) STUDY PLANS

~ 12% (4) TO HQ BY 7/3/87

5/10/87 TPO MEETING

WMPO REVIEW SCHEDULE

- PARTICIPANT SUBMITS DRAFT STUDY PLAN WITH COMPLETED HQ CHECKLIST
- WMPO VERIFIES CHECKLIST
- STUDY PLAN DISTRIBUTED FOR REVIEW
 - COPIES TO HQ
 - COPIES TO PROJECT STUDY PLAN REVIEW COMMITTEE
 - HQ/PO COMPLETE PARALLEL REVIEW

5/20/87 TPO MEETING

HQ REVIEW OF EXCAVATION INVESTIGATION
STUDY PLAN

5/1/87 STUDY PLAN SENT TO HQ

5/12/87 DISTRIBUTED TO HQ REVIEWERS

5/28/87 HQ COMMENT CONSOLIDATION MEETING

6/4/87 HQ/PO COMMENT RESOLUTION MEETING

5/20/87 TAB MEETING

- | | YES | NO |
|---|-----|----|
| 1. Is the study identified in the SCP with the same title and numbers?
<i>Study Plan # should be keyed directly to the SCP and be 8.3.1.15.2
Title should not use term "Investigation"</i> | — | ✓ |
| 2. Is the study described in the study plan consistent with the study description presented in the SCP? | ✓ | — |
| 3. Is there an explicit link between the tests and analyses in the study and the relevant issue resolution strategies (including relevant performance goals or parameter goals) set forth in the SCP? | ✓ | — |
| 4. Is the overall schedule for the study in the study plan consistent with the schedule presented in the SCP Section 8.5?
<i>This review contingent upon completion of section 8.5. Da</i> | — | ✓ |
| 5. Does the study plan contain the material called for in the May 7-8, 1986 DOE-NRC agreement on content requirements? Specifically, does it contain: | ✓ | — |
| I. Purpose and Objective of Study | ✓ | — |
| II. Rationale for Selected Study | ✓ | — |
| III. Description of Tests and Analysis | ✓ | — |
| IV. Application of Results | ✓ | — |
| V. Schedule and Milestones | ✓ | — |

USGS DRAFT STUDY PLAN

- CHARACTERIZATION OF PERCOLATION
IN THE UNSATURATED ZONE SUBMITTED
TO WMPO 5/12/87
 - CONSISTENT WITH DOE/NRC LEVEL
OF DETAIL /FORMAT
- INFORMAL COMMENTS TO USGS 5/19/87

pm/TPO Meeting

5/20/87

SCP status

SUCCESS-ORIENTED SCHEDULE FOR SCP (CHAPTERS 1-7)

5/20/87
PM/TPO McETA

TITLE	CP	EARLY START/FIN	87								
UNASSIGNED			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	
HO REVIEW CH 1-7	(9 weeks)	14 JAN 87 20 MAR 87	[Bar]								
COMMENT RESOLUTION WORKSHOP CH 1-7	(2 weeks)	23 MAR 87 03 APR 87			[Bar]						
REVISE PER COMMENTS	(1 week)	06 APR 87 13 APR 87				[Bar]					
PRODUCE CAMERA-READY COPY CH 1-7 (CONCURRENCE COPY)	(4 weeks)	13 APR 87 11 MAY 87					[Bar]				
NVO CONCURRENCE REVIEW	(1 week)	11 MAY 87 18 MAY 87						[Bar]			
HO CONCURRENCE REVIEW	(2 weeks)	11 MAY 87 25 MAY 87						[Bar]			
FINAL TEXT CORRECTIONS	(1 week)	25 MAY 87 01 JUN 87							[Bar]		

RUN DATE: 11-MAR-87 13:51 SCPACC3.CH8:1

SUCCESS-ORIENTED SCHEDULE FOR SCP (CHAPTER 8)

TITLE	CP	EARLY START/FIN	87							
UNASSIGNED			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1ST HO REVIEW/COMMENT CYCLE	(9 weeks)	14 JAN 87 06 MAR 87	[Bar]							
REVISE SCP SECTIONS OF CH 8 PER 1ST COMMENT CYCLE	(8 weeks)	06 MAR 87 01 MAY 87			[Bar]					
PRODUCE REVISED DRAFT CH 8	(3 weeks)	01 MAY 87 22 MAY 87					[Bar]			
2ND HO REVIEW	(2 weeks)	25 MAY 87 05 JUN 87						[Bar]		
2ND COMMENT RESOLUTION WORKSHOP	(2 weeks)	08 JUN 87 19 JUN 87							[Bar]	
INTEGRATE COMMENTS & PRODUCE CONCURRENCE COPY	(3 weeks)	19 JUN 87 10 JUL 87							[Bar]	
NVO CONCURRENCE REVIEW	(1 week)	10 JUL 87 17 JUL 87								[Bar]
HO CONCURRENCE REVIEW	(2 weeks)	10 JUL 87 24 JUL 87								[Bar]
FINAL TEXT CORRECTIONS	(1 week)	24 JUL 87 31 JUL 87								[Bar]
PRINT FINAL TEXT (CH 1-8)	(3 weeks)	31 JUL 87 21 AUG 87								[Bar]
DISTRIBUTE TEXT	(3 days)	21 AUG 87 24 AUG 87								[Bar]

Concurrence Reviews → Combined

4.3.5.7
8.3.5.10
9.3.4
8.3.5.6
8.3.5.7
8.3.5.18

MAY DRAFT

MAY 20, 1987
PM/TPO MEETING

SCP SECTION NO.

STATUS

- 8.1 Rationale -HQ prepared section to be added later
- 8.2 Issues - Summaries of current 8.3 sections under preparation; will be submitted June 8, 1987
- 8.3.1 Site Program Plans - All of Section 8.3.1 is included in draft
- 8.3.2 Repository Program - All of Section 8.3.2 is included except as noted
- 8.3.2.3 Repository Radiological Design Criteria - Not available for draft; section will be submitted by May 27, 1987
- 8.3.3 Seals Program - All of Section 8.3.3 is included in the draft
- 8.3.4 Waste Package Program - All of Section 8.3.4 is included in the draft
- 8.3.5 Performance Assessment Program - All of Section 8.3.5 is included except as noted

SCP SECTION NO.

STATUS

- 8.3.5.1 Strategy for Preclosure Performance Assessment -
HQ prepared Section to be added later
- 8.3.5.6* Higher Level Findings - Radiological Safety
- 8.3.5.7* Higher Level Findings - Ease and Cost of
Construction
- 8.3.5.18* Higher Level Findings - Postclosure Technical
Guidelines;

*These three higher level findings sections are being revised based on HQ guidance given on May 1, 1987. Sections should be available for review no later than June 29, 1987.

- 8.4 Site Preparation - Included in draft
- 8.5 Schedules - Under revision to incorporate new materials in current version Section 8.3; section will be available for review by June 8, 1987
- 8.6 Quality Assurance - Included in draft
- 8.7 Site Decontamination - Included in draft

CRITICAL PATH B.3.5.6, B.3.5.7, B.3.5.1B

TPO
5-20-87 1/2

SUMMARY OF EVOLUTION OF CONTENT OF THE DOE'S SITING GUIDELINE ISSUES (ISSUES 1.9, 2.5, AND 4.1)

PRE-DECEMBER GUIDANCE FROM HQ

- DESPITE PROJECT CONCERNS THAT THE DOE'S FAVORABLE CONDITIONS (FCS) AND POTENTIALLY ADVERSE CONDITIONS (PACS) WILL HAVE TO BE READDRESSSED, DO NOT EXPLICITLY DISCUSS THE FCS AND PACS IN THE SCP

EARLY DECEMBER FORMAT PROPOSED BY PROJECT

DISCUSS EACH TECH. GUIDELINE DISQUALIFYING CONDITION (DQ)

- LIST STUDIES OF OTHER ISSUES THAT WILL PROVIDE THE INFO FOR HIGHER LEVEL FINDING (HLF) FOR EACH DQ

DISCUSS EACH TECH. GUIDELINE QUALIFYING CONDITION (QC)

- INCLUDE DISCUSSION OF EACH PAC AND A STATEMENT THAT THEY WILL BE CONSIDERED IN THE EVALUATION OF THE QC
- LIST STUDIES OF OTHER ISSUES THAT WILL PROVIDE THE INFO FOR HLF FOR EACH QC

DISCUSS SYSTEM GUIDELINE QUALIFYING CONDITION

HQ GUIDANCE (DECEMBER POC MEETING)

- BECAUSE FC/PACS ONLY NEEDED TO BE CONSIDERED WHEN SUFFICIENT SITE EVIDENCE WAS NOT AVAILABLE, THEY NEED NOT BE CONSIDERED AFTER SITE CHARACTERIZATION, WHEN MAKING HLF'S
- ELIMINATE ALL DISCUSSION OF FC/PACS

CRITICAL PATH E.3.5.6, E.3.5.7, E.3.5.10

TPD
5-20-87 1/2

HQ GUIDANCE (FEBRUARY WORKSHOPS)

- SINCE TECH. GUIDELINE QCS REFER BACK TO THE SYSTEM GUIDELINE QUALIFYING CONDITION, TAKE THE POSITION THAT MAKING A HLF FOR THE SYSTEM GUIDELINE QC WILL LOGICALLY ALLOW HLFs FOR THE TECH. GUIDELINE QCS TO BE MADE
- ELIMINATE INDIVIDUAL DISCUSSIONS OF EACH TECHNICAL GUIDELINE AND DISCUSS ONLY THE SYSTEM GUIDELINE QC AND ANY DISQUALIFYING CONDITIONS THAT ARE NOT TIED TO THE SYSTEM GUIDELINE

HQ GUIDANCE (MAY 1, 1986)

- THE FC/PACS AND THE QCS NEED TO BE ADDRESSED MORE EXPLICITLY
- CORRELATE THE QCS, DCS, FCS AND PACS OF THE TECH. GUIDELINES WITH THE NRC REGULATIONS (AND APPROPRIATE ISSUES)
- DISCUSS EACH QC AND DC OF THE TECH. GUIDELINES INDIVIDUALLY
- INCLUDE IN THE DISCUSSIONS OF THE QCS A DISCUSSION OF THE FCS AND PACS
- PROVIDE A TABLE FOR EACH TECH. GUIDELINE THAT SHOWS EACH FC AND PAC AND STUDIES OF OTHER ISSUES THAT WOULD PROVIDE INFO ASSOCIATED WITH EACH FC AND PAC

NOTE: IN THE FEB. REVIEW OF ISSUE 1.8 (NRC SITING CRITERIA) HQ GUIDANCE WAS TO ELIMINATE ANY CORRELATION OF THE DOE'S FC/PACS WITH THE NRC'S FC/PACS

May 20, 1987

SCP PRODUCTION STATUS AS OF
11:00 A.M. 5/20/87

- o ALL TEXT HAS BEEN RECEIVED AND WORD PROCESSED

- o DUAL NUMBERING SYSTEM HAS BEEN USED
 - PRESERVES ISSUE NUMBERS FOR TRACKING
 - STUDIES AND ACTIVITIES HAVE UNIQUE 8.3 SECTION NUMBERS

- o NEW TABLES AND FIGURES ARE IN VARIABLE CONDITION
 - PARAMETERS TABLES WILL BE VERY ROUGH AS WILL TEXT DESCRIPTIONS
 - SOME OF LOGIC DIAGRAMS ARE INCOMPLETE AND TEXT DESCRIPTIONS NEED WORK

MAY 20, 1987
SCP STATUS - CONTINUED

- o FINAL DRAFT OF CHAPTER 8 DUE AT PRINTING AT 6:00 A.M. FRIDAY, MAY 22, 1987

- o 100 COPIES TO BE MADE AND DISTRIBUTED
 - 32 COPIES TO HQ & WESTON
 - 43 COPIES TO SAIC FOR PROJECT REVIEW MAY 26 - JUNE 6

- o PROJECT REVIEWS -- FIVE TEAMS WILL BE HERE AT SAIC FOR TWO WEEKS OF REVIEW
 - TEAM 1: POSTCLOS. PERF. AND SITE
 - TEAM 2: REPOSITORY, WASTE PACKAGE AND SITE
 - TEAM 3: PERFORMANCE ASSESSMENT INTEGRATION (POSTCLOS.)
 - TEAM 4: PRECLOSURE RAD. SAFETY AND SITE
 - TEAM 5: OVERVIEWS

May 20, 1987
SCP STATUS CONTINUED

PLANS FOR HQ COMMENT RESOLUTION WORKSHOPS

- o PERFORMANCE AND DESIGN ISSUES COVERED FIRST WEEK FROM JUNE 8 - 12
- o CHARACTERIZATION PROGRAMS COVERED SECOND WEEK FROM JUNE 15 - 19
- o WORKING SCHEDULE FOR HQ WORKSHOPS IS ATTACHED

No.	Subject	Group	Workshop Date
8.0	Introduction HQ-prepared	A	6/8
8.1	Rationale HQ-prepared	A	6/8
8.2	Issues J Younker	A	6/15-16
8.3.1.1	Overview (Site Program) J. Younker	A	6/11
8.3.1.2	Geohydrology Wilson-Cullen-Barbour	F	6/15-16
8.3.1.3	Geochemistry Canepa	G	6/16-18
8.3.1.4	Rock characteristics (postclosure) Eppler-Barbour	H	6/15-18
8.3.1.5	Climate Moore - Saltzer	I	6/15-18
8.3.1.6	Erosion Giampaoli	L	6/15
8.3.1.7	Dissolution Canepa	G	6/16
8.3.1.8	Tectonics (postclosure) Grant - Fox	J	6/15-18
8.3.1.9	Human Interference Giampaoli	K	6/15
8.3.1.10	Population Fasano	D	6/9-10
8.3.1.11	Land Ownership Fasano	D	6/9-10
8.3.1.12	Metereology Jablonski	D	6/9-10
8.3.1.13	Offsite Installations Fasano	D	6/9-10
8.3.1.14	Surface Characteristics Sublette - Neal	L	6/15
8.3.1.15	Rock Characteristics (preclosure) Nmick	H	6/15-18
8.3.1.16	Hydrology Giampaoli	F	6/17-18
8.3.1.17	Tectonics (preclosure) King-Frazier-Fox	J	6/15-18
8.3.2.1	Overview (Repository Program) Stevens	E	6/8
8.3.2.2	Underground Facilities (Issue 1.11) Stevens-Tillerson- ^{Vegete}	E	6/8
8.3.2.3	Radiological Design (Issue 2.7) Stevens-Tillerson- ^{Vegete}	E	6/9
8.3.2.4	Nonradiological Health and Safety (Issue 4.2) - "	E	6/9
8.3.2.5	Technical Feasibility (Issue 4.4) - "	E	6/10
??	Costs (Issue 4.5)	E	6/11-12
8.3.3	Seal System Program (Issue 1.12) - "	E	6/10-11
8.3.4.1	Overview (Waste Package Program) - Ballou - Rampott	C	6/10
8.3.4.2	WP Characteristics (Issue 1.10) - " "	C	6/10
8.3.4.3	WP Containment (Issue 2.6) - " "	C	6/11
8.3.4.4	WP Production (Issue 4.3) - " "	C	6/11
8.3.5.1	Strategy for Preclosure PA - HQ prepared	D	6/11
8.3.5.2	Waste Retrievability (Issue 2.4) - Stevens-Tillerson- ^{Vegete}	E	6/9
8.3.5.3	Radiological Safety - Public (Issue 2.1) - "	D	6/8
8.3.5.4	Worker Radiological Safety (Issue 2.2) - "	D	6/8
8.3.5.5	Radiological Safety - Accidents (Issue 2.3) - "	D	6/8
8.3.5.6	HLF - Preclosure Rad Safety (Issue 2.5) - "	A	6/17
8.3.5.7	HLF - Ease and Cost (Issue 4.1) - Danna-Stevens	A	6/17
8.3.5.8	Strategy for Postclosure PA - Tierney	B	6/8
8.3.5.9	WP Containment (Issue 1.4) - Ballou - Rampott	C	6/8
8.3.5.10	EBS Performance (Issue 1.5) - " "	C	6/9
8.3.1.11	Plans for Seal System PA - Stevens	B	6/8
8.3.5.12	Plans for GWTT (Issue 1.6) - Sinnock	B	6/12
8.3.5.13	Total Releases (Issue 1.1) - Tierney	B	6/8-9
8.3.5.14	Individual Protection (Issue 1.2) } Giampaoli	B	6/10
8.3.5.15	Ground Water Protection (Issue 1.3) }	B	6/10
8.3.5.16	Performance Confirmation (Issue 1.7) - HQ prepared	A	6/9
8.3.5.17	Siting Criteria (Issue 1.8) - Danna	B	6/17-18
8.3.5.18	HLF - Postclosure (Issue 1.9) - Danna	A	6/18
8.3.5.19	Completed Analytical Techniques } Bingham	B	6/8
8.3.5.20	Techniques Requiring Development }	B	6/8
8.4	Plans for Site Preparation - M.L. Brown	A	6/10
8.5	Schedules - Biddison + TO D	H	6/17-18
8.6	Quality Assurance - Metha	A	6/9
8.7	Decontamination ^{M.L. Brown}	A	6/10

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NRC DEFINITION OF HIGH-LEVEL RADIOACTIVE WASTE (HLW)

OGR

CHRONOLOGY:

- o ADVANCE NOTICE OF PROPOSED RULEMAKING (ANPR) 52 FR 5992, 2/27/87
- o RECEIVED ANPR FROM NRC ON 3/9/87
- o SENT TO TPOs ON 3/26/87...COMMENTS DUE 4/29/87
- o RECEIVED COMMENT REQUEST FROM OFFICE OF ENVIRONMENT GUIDANCE AND COMPLIANCE ON 3/23/87...COMMENTS DUE 4/15/87
- o RECEIVED COMMENT REQUEST FROM OGR (RALPH STEIN) ON 3/23 ...COMMENTS DUE 4/10/87
- o RECEIVED PROPOSED COMMENTS FROM OGR (NAOMI ABRAMS) ON 4/23
- o TELEFAXED DRAFT NNWSI COMMENTS TO OGR ON 4/27
- o REQUESTED OGR EXTEND COMMENT PERIOD TO 6/1/87; REQUEST SENT ON 5/4/87
- o NRC EXTENDS COMMENT PERIOD 60 DAYS (DUE 6/29/87) 52 FR 16403, 5/5/87

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NRC DEFINITION OF HLW (CONT'D)

REVIEW STATUS:

- o "NO COMMENT" RESPONSE FROM USGS, HRN AND F&S
- o TWO COMMENTS FROM REECo
- o OTHER TPOs HAVE NOT RESPONDED

PIRPOSE:

- o CONFORM THE 10 CFR 60 DEFINITION OF HLW TO THAT IN THE NWPA
- o DETERMINE WHAT WASTES MUST GO TO A REPOSITORY

THE PROPOSED DEFINITION OF HLW, ACCORDING TO THE ANPR, COULD INCLUDE THE FOLLOWING TYPES OF RADIOACTIVE WASTE:

- o SALT CAKE, A REPROCESSING PRODUCT
- o ANY RADIOACTIVE MATERIAL THAT EXCEEDS THE CONCENTRATION LIMITS IN 10 CFR 61
- o NATURALLY OCCURRING MATERIAL OR ACCELERATED-PRODUCED RADIOACTIVE MATERIALS (NARM)

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NRC DEFINITION OF HLW (CONT'D)

POTENTIAL IMPACTS TO THE REPOSITORY PROGRAM

o SALT CAKE

- ACCELERATE WASTE PACKAGE CORROSION
- COMPLICATE PERFORMANCE ASSESSMENTS
- REDUCE REPOSITORY CAPACITY

o NARM

- CORROSION PRODUCTS FROM SEALED SOURCES COULD REACT WITH SPENT FUEL AND BOROSILICATE GLASS
- RADIUM 226 WOULD DECAY TO RADON GAS; DIFFICULT TO CONTROL GASEOUS RELEASES IN THE UNSATURATED ZONE

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NRC DEFINITION OF HLW (CONT'D)

RECOMMENDATIONS:

- o SALT CAKE SHOULD NOT GO TO A REPOSITORY
- o DOE AND NRC SHOULD DETERMINE THE CONCENTRATION LIMIT THAT WOULD DEFINE HLW
 - 10 CFR 61 LIMITS MAY NOT BE APPROPRIATE
 - 3RD CATEGORY OF WASTE: INTERMEDIATE-LEVEL WASTE, MAY BE NEEDED
- o BEFORE NRC DESIGNATES NARM OR ANY OTHER RADIOACTIVE MATERIAL AS HLW, IT SHOULD ENSURE THAT THE DISPOSAL CRITERIA IN 10 CFR 60 ARE PERTINENT TO THAT WASTE

HEADQUARTER'S DEFINITIONS OF REGULATORY TERMS

	APRIL, 1986	OCTOBER, 1986	APRIL, 1987	MAY, 1987
1. ANTICIPATED PROCESSES AND EVENTS	CUMULATIVE PROBABILITY (Pc) $Pc \geq 0.1$	PROBABILITY (P) AND Pc Por $Pc \geq 0.1$		$P \geq 0.1$
2. UNANTICIPATED PROCESSES AND EVENTS	CUMULATIVE PROBABILITY $0.1 > Pc \geq .0001$	PROBABILITY (P) AND Pc $0.1 > Por Pc \geq .0001$		$P < 0.1$
3. ENGINEERED BARRIER SYSTEM BOUNDARY	EXCLUDES HOST ROCK	INCLUDES HOST ROCK	EXCLUDES HOST ROCK	SAME
4. DISTURBED ZONE			BETWEEN 0.5 AND 5 OPENING DIAMETERS FROM MAJOR OPENINGS	SAME

NNWSI COMMENTS

HEADQUARTERS ORGANIZES A DEFINITION SUBCOMMITTEE

HEADQUARTER'S DEFINITIONS OF REGULATORY TERMS (CONT'D)

	APRIL, 1986	OCTOBER, 1986	APRIL, 1987	MAY, 1987
5. SUBSTANTIALLY COMPLETE CONTAINMENT	o CUMULATIVE RELEASES DURING CONTAINMENT MUST BE THE SAME AS CUMULATIVE RELEASES AFTER CONTAINMENT	o SAME	o ANNUAL RELEASES	o SAME
	o RELEASES MUST BE $< 10^{-5}$ OF 1,000 YR INVENTORY	o SAME	o RELEASES MUST BE $< 10^{-5}$ OF INVENTORY WHEN RELEASES OCCUR	o SAME
	o NUCLIDE SPECIFIC	o SAME	o NOT NUCLIDE SPECIFIC	o SAME
	o EXEMPTS RADIO-NUCLIDES WITH HALF LIVES < 45 YRS	o SAME	o EXEMPT DELETED	o SAME
			o 80% OF THE WASTE PACKAGES MUST STAY INTACT	o SAME
			o 99% OF ACTIVITY CONTAINED IN PACKAGES THAT FAIL	o SAME
				o CANNOT USE DRY ENVIRONMENT TO PROVE CONTAINMENT

NNWSI COMMENTS

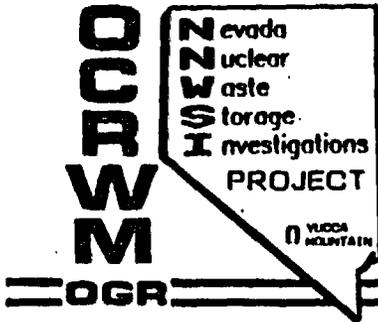
HEADQUARTERS ORGANIZES A DEFINITIONS SUBCOMMITTEE

U.S. DEPARTMENT OF ENERGY



WASTE PACKAGE - REPOSITORY
DESIGN INTERFACE GROUP

- o SEVERAL AD HOC INFORMAL MEETINGS DURING CONCEPTUAL DESIGN
- o CURRENT GROUP DEFINED MAY 15, 1987
- o GROUP SIZE: 6-10 ENGINEERS
- o PARTICIPANT REPRESENTATION:
 - SNL
 - LLNL
 - WMPO
 - SAIC
- o CURRENT GROUP MEMBERS SELECTED BY JUNE 1, 1987
- o CURRENT GROUP ACTIVITIES BEGIN MID-JUNE, 1987



WASTE PACKAGE - REPOSITORY
DESIGN INTERFACE GROUP

RESPONSIBILITIES

- o PROVIDE FORMAL AND SCHEDULED COMMUNICATIONS BETWEEN PARTICIPANTS
- o IDENTIFY AND COORDINATE SYSTEMS/DESIGN STUDIES IN INTERFACE AREAS
- o DEVELOP MUTUALLY COMPATIBLE DESIGN APPROACHES
- o RECOMMEND INITIAL AND REVISIONS TO DESIGN REQUIREMENTS
- o IDENTIFY AND COORDINATE DOCUMENTATION OF INTERFACES
- o RECOMMEND INTERFACE DOCUMENTATION FOR NNWSI PROJECT BASELINE
- o SUPPORT WMPO DEVELOPMENT OF PROJECT POSITIONS IN WASTE PACKAGE AND REPOSITORY SUBSYSTEMS



INTEGRATION OF WASTE PACKAGE AND REPOSITORY

o BASES FOR INTEGRATION: OCRWM AND OGR SEMP'S

o VEHICLES FOR INTEGRATION:

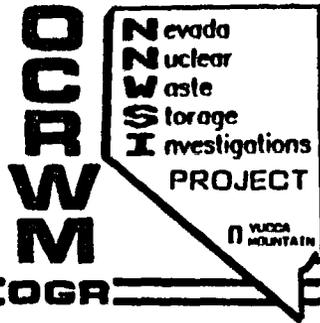
- SCP — [CONCEPTUAL DESIGNS
ISSUE RESOLUTION STRATEGIES

- GR/SR — [RDR
WPDR

- REPORTS OF SYSTEM STUDIES

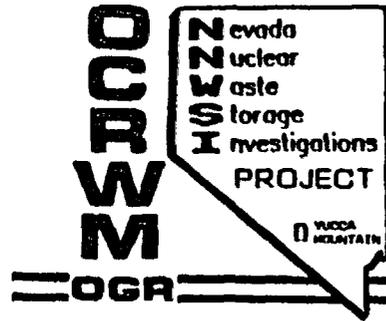
- RIB

- ACD



EXISTING PRODUCTS EXHIBITING
WASTE PACKAGE/REPOSITORY INTERFACING ACTIVITIES

- o **SITE CHARACTERIZATION PLAN**
 - SECTION 6.1 REPOSITORY DESIGN BASES - WASTE PACKAGE
 - SECTION 7.3 WASTE PACKAGE DESIGN DESCRIPTION - EMPLACEMENT HOLE
 - SECTION 8.3 PERFORMANCE ALLOCATION WORKSHOPS
- o **CONCEPTUAL DESIGN REPORT**
 - SECTION 2.1 WASTE TYPES AND PACKAGING
- o **CONCEPTUAL DESIGN COST ESTIMATE**
- o **ROD CONSOLIDATION STUDY**
- o **RIB CHAPTER 2 DESIGN CONFIGURATIONS**



KEY DESIGN INTERFACE AREAS

- o **WASTE PACKAGE/REPOSITORY DESIGN INTERFACES**
 - SURFACE WASTE HANDLING FACILITIES
 - UNDERGROUND WASTE EMPLACEMENT CONFIGURATION
 - NORMAL HANDLING/TRANSPORT LOADS
 - POSTULATED ACCIDENT LOADS
 - RETRIEVABILITY

- o **WASTE PACKAGE ENVIRONMENT**
 - MECHANICAL LOADING ON CONTAINER
 - THERMAL ENVIRONMENT
 - HYDRO-GEOCHEMICAL ENVIRONMENT
 - MATERIALS COMPATIBILITY

- o **WASTE PACKAGE PROCESS CONDITIONS**
 - WELDING
 - INSPECTIONS
 - REWORK

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KEY ACTIVITY INTERFACE AREAS

- o SELECTION OF, AND AGREEMENT ON, DESIGN ASSUMPTIONS
- o DEVELOPMENT OF PERFORMANCE CRITERIA
- o DEFINITION OF ACCIDENT ANALYSES BASES
- o DEFINITION OF, AND CHANGES TO, THE REFERENCE DATA BASE
- o DEVELOPMENT OF ANALYTICAL METHODS AND MODELS
- o PREPARATION OF CONSISTENT PROJECT DOCUMENTATION

STOP WORK ORDER STATUS

MAY 1987 TPO MEETING

USGS STOP WORK ORDER STATUS

ISSUED: APRIL 28, 1986, RESULT OF WMPO AUDIT 86-2 AND SURVEILLANCE 86-23

CONDITIONS TO RESUME WORK:

- o PROPOSED CORRECTIVE ACTIONS AND SCHEDULES FOR COMPLETION OF AUDIT FINDINGS APPROVED BY WMPO.
- o QAPP REVISED AND APPROVED BY WMPO.
- o INDOCTRINATION AND TRAINING COMPLETE.
- o PLAN TO PROVIDE ADEQUATE QA COVERAGE.
- o ASSIGNMENT OF QA LEVELS COMPLETED AND APPROVED BY WMPO.

STATUS:

- o THE FIRST FOUR CONDITIONS IDENTIFIED ABOVE HAVE BEEN SATISFIED.
- o THE STOP WORK ORDER WILL BE LIFTED INCREMENTALLY WITH WMPO APPROVAL OF THE USGS SIPS AND ASSOCIATED QA LEVELS.
- o THREE (3) SIPS HAVE BEEN APPROVED BY WMPO. ONE (1) SIP IS IN THE FORMAL WMPO APPROVAL CYCLE. THIS SIP IS IN THE PROCESS OF BEING REJECTED DUE TO FAILURE TO INCORPORATE PREVIOUS WMPO COMMENTS REGARDING QA LEVEL ASSIGNMENT. TWENTY EIGHT SIPS ARE IN PROCESS OF INFORMAL REVIEW. COMMENTS ON FOURTEEN (14) OF THESE SIPS WERE DISCUSSED WITH USGS PERSONNEL ON MAY 12-14, 1987. A REVIEW MEETING FOR EIGHT (8) ADDITIONAL SIPS HAS BEEN TENTATIVELY SCHEDULED FOR JUNE 3-4, 1987.

LLNL STOP WORK ORDER STATUS

ISSUED: JUNE 10, 1986, AS A RESULT OF WMPO SURVEILLANCE 86-21, 86-24, AND 86-25.

CONDITION TO RESUME WORK:

- o ASSIGNMENT OF QA LEVELS COMPLETE AND APPROVED BY WMPO.

STATUS:

- o FIVE (5) SIPs HAVE BEEN APPROVED BY WMPO. WORK IS AUTHORIZED TO PROCEED.
- o THERE ARE FIVE (5) SIPs REMAINING WHICH REQUIRE SUBMITTAL FOR WMPO APPROVAL.

AGENDA

NNWSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

N-AP-02P
/86

LOCATION: 101 Convention Center Drive

PAGE: 1

Las Vegas, Nevada

DATE: APRIL 22-23, 1987

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
Wednesday April 22 7:30- 8:15	INTRODUCTION/ROLES AGENDA/OUTCOMES MARCH MINUTES TPO ACTION ITEMS	REVIEW AND APPROVE AGENDA REVIEW MINUTES REVIEW AND UPDATE ACTION ITEMS	FIORE	AGREE TO AGENDA AND OUTCOMES APPROVE MINUTES UPDATE ACTION ITEM LIST	AGENDA SENT 4-14-87 MINUTES ISSUED FIRST WEEK IN APRIL TO BE PROVIDED AT MEETING
8:15- 8:45	FYI's -BENNETT JOHNSTON'S BILL -MRS STATUS -CONGRESSIONAL STATUS OF 88 BUDGET -RESULTS OF NRC/STATE MEETING ON ESF -NRC REORGANIZATION -QA AUDIT AT LANL -CDR REVIEW		VIETH VIETH VIETH VIETH PRESTHOLT OAKLEY HUNTER	INFORMATION TRANSFER	
8:45- 9:00	BREAK				
9:00-10:00	STATUS REPORTS -TECHNICAL DATA BASE	BRIEF REPORTS (10 MIN) -INPUT TO TDB	HUNTER	BRIEF TPO'S ON IMPORTANT ITEMS; DETERMINE IF CHANGES IN PROCESS OR APPROACH ARE NECESSARY -IDENTIFY AREAS WHERE DATA HAS BEEN PROVIDED IN LAST MONTH AND AREAS WHERE SHORTCOMINGS STILL EXIST	

AGENDA

NNWSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

N-AD-028
/86

LOCATION: 101 Convention Center Drive

PAGE: 2

Las Vegas, Nevada

DATE: APRIL 22-23, 1987

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
<p>Wednesday April 22</p>	<p>-SEMP/CMP -NETWORK STATUS -QA STATUS</p>	<p>-STATUS OF SEMP & CMP -PROGRESS REPORT -STATUS OF STOP WORK ORDERS</p>	<p>DIXON/ROBSON GARVIN SMITH</p>	<p>-UNDERSTAND PROGRESS SINCE LAST MEETING -UNDERSTAND STATUS OF NETWORK PROGRESS -UNDERSTAND PROGRESS MADE AT SAIC, LLNL AND USGS FOR LIFTING STOP WORK ORDERS</p>	
<p>10:00-11:00</p>	<p>ESTABLISH BASELINE FOR FY1987 ACTIVITIES</p>	<p>-PRESENT STATUS OF BASELINED AND PLANNED LEVEL 1 & 2 MILESTONES BY PARTICIPANT -PRESENT PLAN & SCHEDULE FOR COMPLETING MODIFICATIONS TO CURRENT BASELINED ITEMS, AND ADDING PLANNED ITEMS TO BASELINE</p>	<p>BELYEA/KUNICH</p>	<p>-UNDERSTAND STATUS OF BASELINED & PLANNED MILESTONES -REACH AGREEMENT WITH PARTICIPANTS ON COMPLETING FY87 INPUT BY MAY 30 & CCB COMPLETE ACTIONS BY JUNE 30, 1987</p>	<p>MATERIAL TO BE SENT TO TPO'S ON 4/14</p>
<p>11:00-11:15</p>	<p>BREAK</p>				
<p>11:15-11:45</p>	<p>PERFORMANCE MEASUREMENT REPORT</p>	<p>PROJECT STATUS BASED ON PERFORMANCE MEASUREMENT</p>	<p>SWEENEY</p>	<p>-UNDERSTAND COST & SCHEDULE STATUS FOR THE PROGRAM. -DETERMINE IF THE PERFORMANCE MEASUREMENT SYSTEM IS PROVIDING INFORMATION IN A TIMELY AND USEABLE FASHION FOR MANAGEMENT USE.</p>	

AGENDA

NNWSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

N-AD-028
/86

LOCATION: 101 Convention Center Drive

PAGE: 3

Las Vegas, Nevada

DATE: APRIL 22-23, 1987

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
Wednesday April 22 11:45-12:45	LUNCH				
12:45- 1:30	WMPO/PARTICIPANT ACTION ITEMS	REVIEW AND UPDATE ACTION ITEMS	FIORE	UPDATE ACTION ITEM LIST	LIST SENT 4-14-87
1:30- 2:00	WPAS STATUS	-REPORT THE RESULT OF THE WPAS EXERCISE. REPORT WHAT WORKED & WHAT NEEDS TO BE IMPROVED FOR FUTURE WPAS DRILLS.	SHIPLEY	UNDERSTAND RESULTS OF WPAS PROCESS	
2:00- 2:15	BREAK				
2:15- 5:00	EXECUTIVE SESSION				

AGENDA

NNWSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

N-AD-028
/86

LOCATION: 101 Convention Center Drive

PAGE: 4

Las Vegas, Nevada

DATE: APRIL 22-23, 1987

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
<p>Thursday April 23 8:00-10:00</p>	<p>SCP</p> <p>-CHAPTERS 1-7 -PLANS FOR REVIEW OF SECTION 8.3</p>	<p>-SCP STATUS REVIEW</p>	<p>CLANTON & YOUNKER</p>	<p>-UNDERSTAND STATUS & AGREE TO PLAN FOR PROCEEDING AND SCHEDULE.</p> <p>-UNDERSTAND PLANS AND ACTIVITIES TO REVIEW 8.3 IN PARALLEL WITH HQ REVIEW</p>	
<p>10:00-10:15</p>	<p>BREAK</p>				
<p>10:15-10:45</p>	<p>SCP SECTION 8.5 (MILESTONES & SCHEDULES)</p>	<p>-REPORT ON PROGRESS TO COMPLETE SECTION 8.5. PRESENT AN EXAMPLE OF INFORMATION PRESENTED IN 8.5 - SOLICIT COMMENTS OF TPO'S</p>	<p>YOUNKER & BIDDISON</p>	<p>UNDERSTAND CONCEPT OF SECTION 8.5 AND THE STATUS OF PROGRESS ON THIS SECTION. UNDERSTAND & COMMENT ON PLAN PRESENTED TO COMPLETE THE SECTION, AND AGREE TO SCHEDULE ONE DAY MEETING WITH TPO'S IN MAY</p>	
<p>10:45-11:15</p>	<p>STUDY PLANS</p>	<p>-PRESENT A REVISED LIST OF STUDY PLANS BASED ON INPUT RECEIVED ON THE LAST LIST -PRESENT DRAFT REVISIONS TO SCP MANAGEMENT PLAN TO ACCOMMODATE PREPARATION OF STUDY PLANS</p>	<p>CLANTON/PENDLETON</p>	<p>-AGREE TO LIST OF STUDY PLANS</p> <p>-UNDERSTAND AND COMMENT ON PROPOSED PLAN AND SCHEDULE. AGREE TO A PLAN AND SCHEDULE.</p>	

AGENDA

NNWSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

N-AD-02R
/86

LOCATION: 101 Convention Center Drive

PAGE: 5

Las Vegas, Nevada

DATE: APRIL 22-23, 1987

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
Thursday April 23 11:15-11:45	PROCESS FOR DOCUMENT REVIEW, ACCEPTANCE & APPROVAL	SUMMARIZE QMP-06-03 AND THE COMMENTS WHICH HAVE BEEN RECEIVED ON THE PROCEDURE.	BLANCHARD & BLAYLOCK	UNDERSTAND THE REVIEW PROCEDURE AND IDENTITY OF DOCUMENTS SUBMITTED TO WMPO FOR REVIEW & APPROVAL	
11:45-12:45	LUNCH				
12:45- 2:15	HYDROGENIC CALCITE-SILICA DEPOSITS	-PLAN FOR PEER REVIEW' -SUMMARY OF THEORIES AND PLAN FOR RESOLVING THE ISSUE	LIVINGSTON & MATTSON STUCKLESS & VANIMAN	-AGREE TO CONDUCT PEER REVIEW AS PRESENTED -UNDERSTAND THE PLANS FOR RESOLUTION OF THIS ISSUE -IDENTIFY SCHEDULE FOR COMPLETION OF FIELD WORK AND ANALYSIS -IDENTIFY MEANS OF VALIDATING RESULTS -IDENTIFY MEANS OF COMMUNICATING RESULTS	
2:15- 2:30	BREAK				
2:30- 4:00	FLUIDS AND MATERIALS IN THE ESF	DISCUSS CONSTRAINTS ON THE USES OF FLUIDS AND MATERIALS IN THE ESF. OUTLINE THE ISSUES AND PROPOSE STRATEGIES AND SCHEDULES TO RESOLVE.	DEPOORTER/IRBY	AGREE TO THE TECHNICAL APPROACH, STRATEGY . UNDERSTAND SCHEDULE PREREQUISITES	VIETH LETTER TO TPO'S DATED 1/21/87 WMPO:DHI-802

AGENDA

NNWSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

N-AD-028
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LOCATION: 101 Convention Center Drive

PAGE: 6

Las Vegas, Nevada

DATE: APRIL 22-23, 1987

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
Thursday April 23 4:00- 4:15	-MEETING EVALUATION -REVIEW ACTION ITEMS AND AGENDA	-EVALUATE MEETING -REVIEW ITEMS GENERATED DURING THIS MEETING	ALL FIORE	-CRITIQUE MEETING AGREE ON AGENDA/ACTION ITEMS	

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HYDROGENIC DEPOSITS



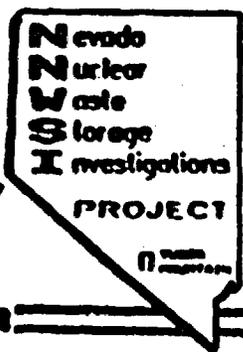
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USGS-LANL PRESENTATION

TPO MEETING

APRIL 23, 1987

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HYDROGENIC DEPOSITS



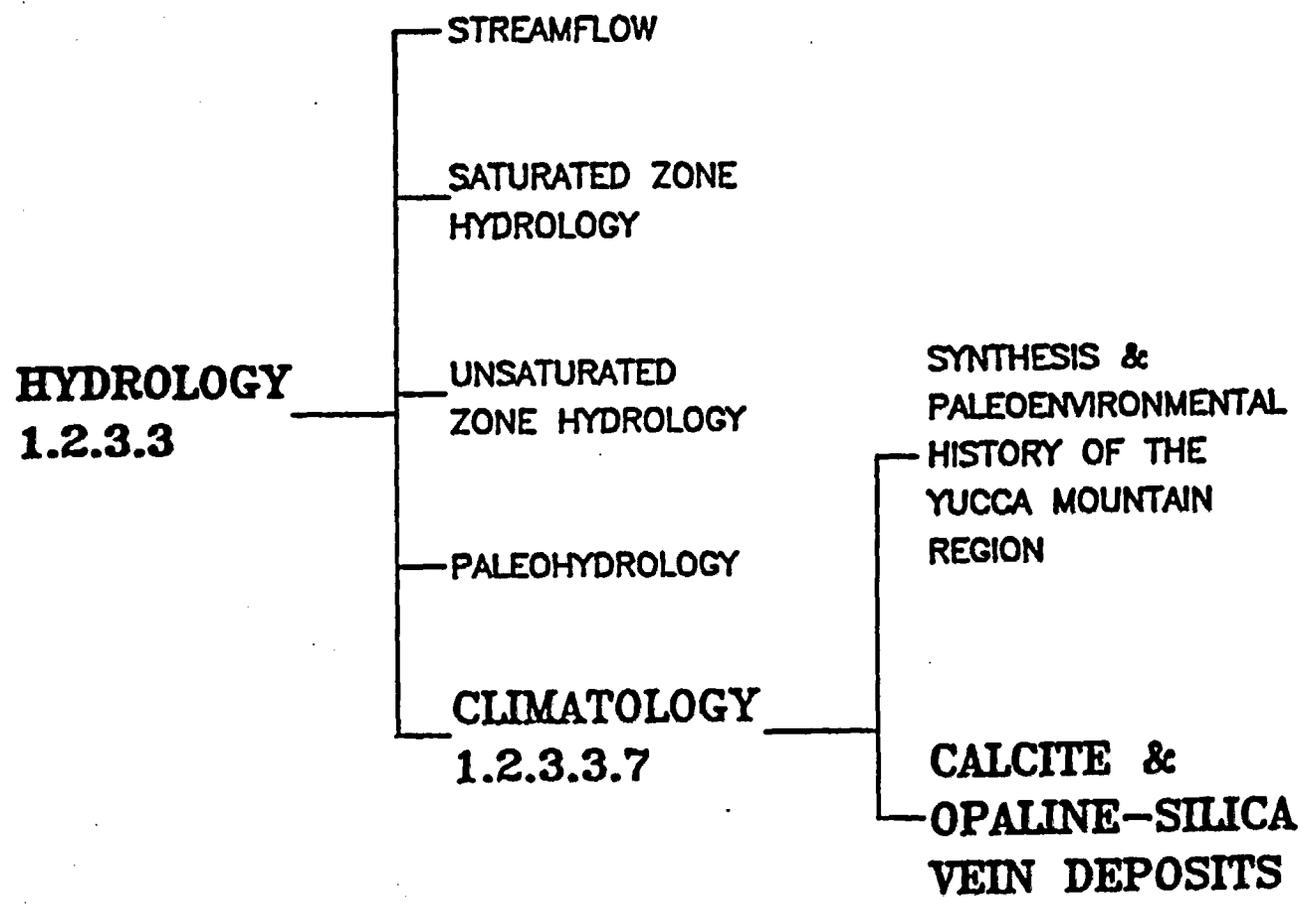
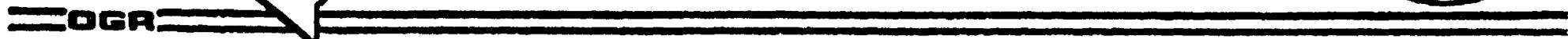
-
1. Minerals and mineraloids precipitated from water.

 2. Types identified around Yucca Mountain:
 - a. Calcite and opaline silica
 - b. Silica-cemented breccia
 - c. Drusy quartz

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CLIMATOLOGY WBS



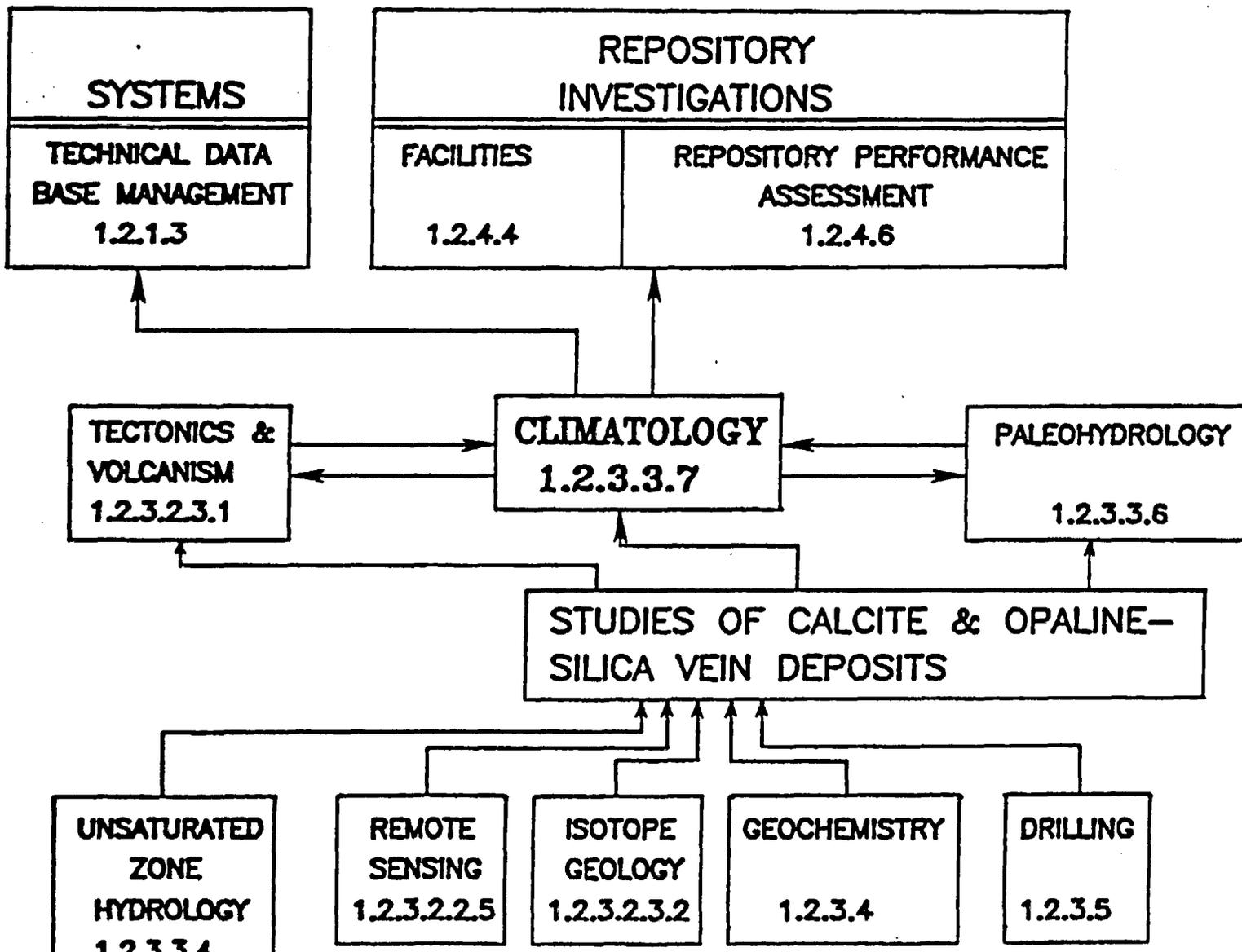
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CLIMATOLOGY WBS



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STATEMENT OF PROBLEM



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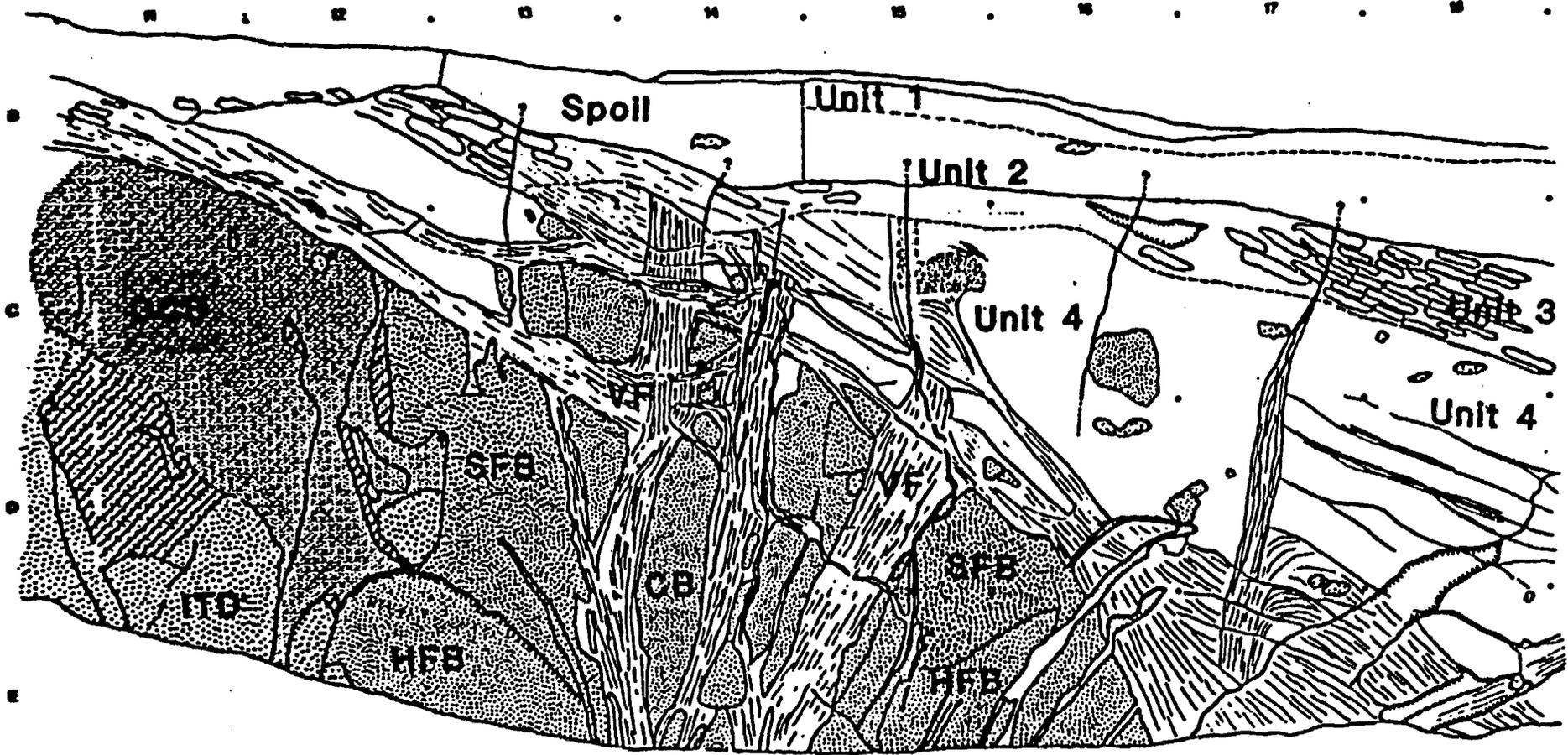
1. Do any hydrogenic deposits have significant implications for repository performance ?
2. What do hydrogenic deposits imply about water at repository depth ?
3. Do any hydrogenic deposits have potential economic implications ?

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TRENCH 14

Current Status



MAP OF SOUTH WALL OF TRENCH 14

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TRENCH 14

Current Status



(CONTINUED)

1. Available data are consistent with a pedogenic origin for the calcite and opaline silica deposit.
2. Preliminary findings argue against high temperature origin for calcite and silica.
 - a) Stable isotopes suggest $\sim 15^{\circ}\text{C}$.
 - b) Fine-grained texture suggests low T.
 - c) No obvious alteration of wall rock.
 - d) Opal types and occurrences are consistent with low T origin.

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TRENCH 14

Current Status



(CONTINUED)

3. Low-temperature spring seems unlikely.
 - a) Biota are not abundant.
 - b) Opal occurrence is not consistent with low-temperature spring analogues.

4. Four ages for calcite and opal suggest deposition more than 400,000 years ago.

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TRENCH 14

Current Status



(CONTINUED)

5. Silica-cemented breccias are probably older than calcite & opaline silica (based on field relations).
 - Depositional mechanism is currently unknown.

6. Drusy quartz is oldest hydrogenic deposit and may be syn-volcanic.
 - fluid-inclusion and isotope data suggest higher temperature of formation than for calcite and opaline silica.

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U.S. GEOLOGICAL SURVEY

SCIENTIFIC APPROACH



COORDINATED INTERDISCIPLINARY STUDIES

- a) Field work
- b) Mineralogy
- c) Geochemistry
- d) Fluid inclusions
- e) Geochronology
- f) Tracer isotopes
- g) Stable isotopes
- h) Paleontology
- i) Hydrology
- j) Data integration

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SURFACE INVESTIGATIONS



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1. Deepen Trench 14.
2. Trench unfaulted, bedrock-colluvium contact for comparison to Trench 14.
3. Trench parallel to Trench 14 to reveal lateral extent and morphology of deposits.
4. Compile regional map of hydrogenic deposits with emphasis on calcite-silica deposits.

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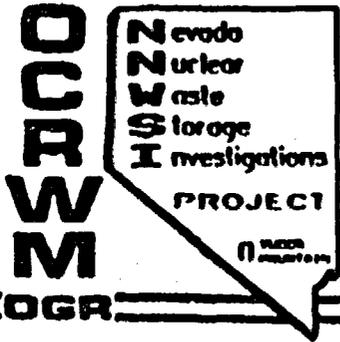
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TRENCH MAPPING

Objectives

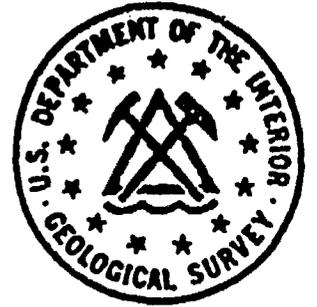


1. To characterize in detail the morphology of fault-related deposits.
2. To determine relative age relations within the hydrogenic deposits.



DRILLING

Objectives



1. To determine the vertical extent of hydrogenic deposits.
2. To investigate chemical, isotopic, and mineralogic changes with depth.

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DRILLING

Approach



(To be used if trenching does not expose the base of the calcite and opaline silica deposit in Trench 14.)

1. Series of shallow vertical holes (up to 5) to intersect deposit at depths up to 20 m.
2. An angle hole to intersect deposit at approximately 80 m.

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MINERALOGY

Background



Presence or absence of certain minerals, degree of crystallinity, chemical composition of some minerals, and crystal morphology all vary as a function of temperature and mode of origin.

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MINERALOGY

Objectives



1. To provide a comparison to deposits of known origin.
2. To determine the petrogenic history of wall rocks, included blocks, and fault fillings in Trench, including some temperatures and ages (e.g. ESR dating of quartz).

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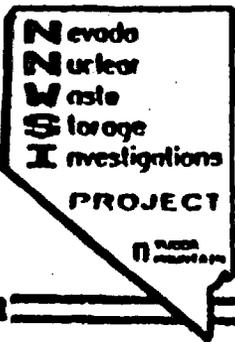
GEOCHEMISTRY

Objectives



1. Compare major and minor element compositions of Trench 14 deposits to spring, lake, and pedogenic deposits at and near NTS.
2. Compare to published data elsewhere.

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FLUID INCLUSIONS

Objectives



1. Determine chemistry of depositing fluids in materials of known origin and minerals from Trench 14.

2. Determine temperatures of precipitation.
 - a) Homogenization temperatures.
 - b) Isotopic analyses.

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TRACER ISOTOPES

Background

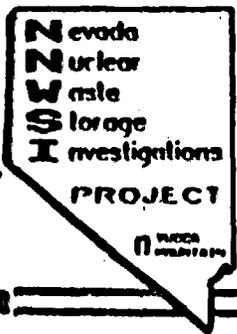


The isotopic compositions of Pb and Sr vary widely in different geologic materials as a function of time and differing U/Pb or Rb/Sr.

Waters in contact with various geologic materials acquire the isotopic composition of those materials.

These compositions are then passed to chemical precipitates from those waters.

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TRACER ISOTOPES

Objectives



To determine sources of water-precipitated deposits and hence, paleo ground water paths.

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ISOTOPIIC DATING

Objectives



1. Determine absolute ages of spring, lake, and pedogenic deposits at and near NTS.
2. Detailed dating of Trench 14 to :
 - compare ages to deposits of known origin.
 - determine history of calcite-silica development.

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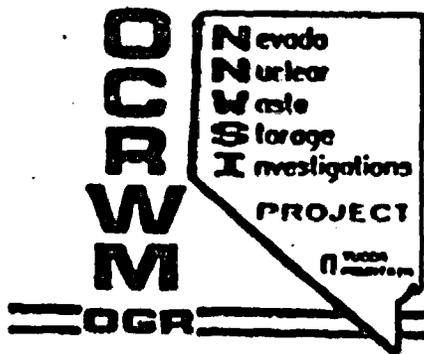
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STABLE ISOTOPES

Objectives



1. To determine temperature of deposition for hydrogenic deposits.
2. To determine paleo isotopic composition of ground water.
3. To look for micro-zonation within hydrogenic deposits.



PALEONTOLOGY

Background



Aquatic taxa are abundant in most surface and many subsurface waters. The types present and their abundances depend upon many variables including : water temperature and chemistry, permanence versus ephemeral, and surface versus subterranean water contribution. Chemistry of preserved testae and shells also provide information on depositional environment.

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PALEONTOLOGY

Objectives



1. To examine hydrogenic deposits for evidence of biological remains.
2. To compare taxa found with those in nearby modern-day analogues.

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HYDROLOGIC MODELS

Objectives



1. To determine what 3-dimensional flow models are consistent with constraints developed by other parts of the study.
2. To develop input for movement of water at repository depth under either saturated or unsaturated conditions.

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VALIDATING RESULTS



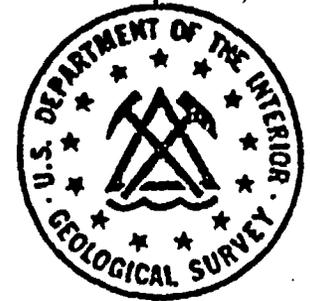
1. Review of Study Plan by Peer Review Panel (to be composed of acknowledged experts).
2. Workshop to review preliminary results and to obtain input from outside personnel and agencies.
3. Workshop to present final results and conclusions.
4. Review of final report by Peer Review Panel of experts.

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VALIDATING RESULTS



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5. Review by scientific community during the project will be encouraged by :
 - a) Papers submitted to refereed journals.
 - b) Presentations at technical meetings.

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SCHEDULE



3/87 Preparation of scientific research proposal

5/87 Peer review

Sample collecting trip (2 to 3 weeks after work is approved).

Preliminary workshop & results (6 to 8 months after sample collection).

Final workshop (20 to 24 months after sample collection).

Final written report (2 to 4 months after final workshop).

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BUDGET

(in thousands of dollars)



Year	FY 87	FY 88	FY 89	FY 90	Total
USGS	400	540	500	300	1740
Support	50	250	50	0	350
LANL	<u>85</u>	<u>85</u>	<u>85</u>	<u>40</u>	<u>295</u>
Total	535	875	635	340	3285

What Worked Well

1. The mechanics of the process worked extremely well.
2. The information flowed smoothly between participants.
3. The communications between participants worked well.
4. The flow of information between participants was traceable and in a uniform format.
5. All participants provided information, therefore, no informational gaps existed.
6. The mechanics of the process worked well in an extremely time intensive situation.
7. The process was well organized and all participants knew what direction to proceed in.

What Was Questionable

1. The questions seemed to center on the product.
2. Two points of view regarding the product were expressed at our budget meetings.
 - a. The funding levels were too high and possibly included cost estimates of work that was not absolutely necessary.
 - b. The funding levels were accurate and represented the true cost of the program based on a detailed planning effort.
3. The appropriate funding levels were somewhere in between arguments 2a and 2b.
4. The major questions and deliberations in our budget meetings centered on where the appropriate funding levels were located between arguments 2a and 2b.
5.

Problem

 - a. Institute more early review into our process in order to specifically identify areas which have questionable schedule or funding scenarios.
 - b. This will allow us to concentrate our efforts on the questionable areas in project budget meetings at the end of the budget formulation process.

Solution

1. Keep the present mechanics of the process.
2. Institute the following review process into our system:
 - a. At the beginning of the budget formulation cycle, a team of SAIC reviewers will be established for each WBS element to provide cost and schedule analysis to the WBS Element Integrator (The reviewers will also provide the Integrator with coordination assistance and will thereby replace the coordinator role).
 - b. The review team will consist of one or two people and will report to cost and schedule control team leaders in SAIC.
 - c. The reviewers must analyze cost and schedule in each WBS Element and advise the Integrator and team leaders regarding any areas that are questionable.
 - d. The Integrator will either agree or disagree with the findings of the reviewers and make the decision as to what constitutes the initial product for the WBS Element.
 - e. If the Integrator disagrees, the reviewers will prepare a report detailing their concerns to the cost and schedule control team leaders.
 - f. When WBS Element budget packages are completed and compiled a project budget meeting will be convened.
 - g. Each WBS Element Integrator will present their case followed by a presentation by their appropriate team reviewers.
 - h. The Project will key in on specifically identified questionable areas and make a decision on each WBS Element.
 - i. The selection of WBS Element reviewers should begin now in order to allow the reviewer sufficient time before the next WPAS to become familiar with their WBS Element.

FY 1989 WPAS DOE/HQ MARKS (B/O)

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<u>Fiscal Year</u>	<u>Project Mark</u>	<u>DOE/HQ Mark</u>	<u>Delta</u>
FY 1988	\$198,686	\$187,686	-11,000 *
FY 1989	\$265,763	\$252,364	-13,400 *

*Assumes that the project mark and DOE/HQ mark are the same for QA (1.2.9), Licensing (1.2.5), and Site C/E (1.2.3)

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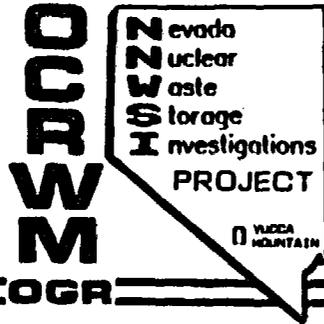
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CALCITE, OPALINE SILICA, AND ± SEPIOLITE
DEPOSITS EXTERNAL PEER REVIEW

ORGANIZATION OF PEER REVIEW

- 1) QA AND NRC GUIDELINES AND REGULATIONS
- 2) NOMINATION AND ACCEPTANCE BY EXTERNAL PEER REVIEWERS TO PARTICIPATE
- 3) PROPOSED DATE: MAY 18, 19, 20, 1987
 - o MAY 18, FIELD TRIP ON THE NTS
 - o MAY 19, PRESENTATIONS AND DISCUSSIONS
 - o MAY 20, PRESENTATIONS, DISCUSSIONS, AND RECOMMENDATIONS
- 4) ENCLOSURES TO BE SUBMITTED TO EXTERNAL PEER REVIEW MEMBERS
 - A) USGS/LANL - PROPOSED STUDY OF HYDROGENIC DEPOSITS
 - B) REFERENCE LIST (PUBLISHED PAPERS, WORKSHOPS, LETTERS)
 - C) HIGHLIGHTED COPIES OF 10 CFR PART 60 AND 40 CFR PART 191
 - D) LETTER - DIRECTION TO EXTERNAL PEER REVIEWERS DOE/WMPO

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NOMINATED EXTERNAL PEER REVIEW MEMBERS

GEOPHYSICS, TECTONICS, GEOMECHANICS:

- 1) AMOS NIJR (STANFORD UNIVERSITY)
- 2) BILL BRACE (MASSACHUSETTS INSTITUTE OF TECHNOLOGY)
- 3) PETER HIDDLESTON (UNIVERSITY OF MINNESOTA)

STARLE ISOTOPES, GEOCHRONOLOGY

- 1) HUGH TAYLOR (CAL. TECH.)
- 2) GIL HANSON (SUNY AT STONEY BROOK)
- 3) RUSSEL HARMON (SOUTH. METHODIST UNIV.)
- 4) GUNTER FAURE (OHIO STATE UNIV.)

GEOMORPHOLOGY

- 1) LES MCFADDEN (UNIV. OF NEW MEXICO)
- 2) LELAND GILE (RETIRED, SOIL CONSERVATION SERVICE)
- 3) BILL BULL (UNIV. OF ARIZONA)
- 4) GLEN ROQUEMORE (NAVAL WEAPONS CENTER)

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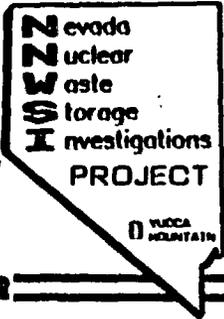
GEOCHEMISTRY, ECONOMIC GEOLOGY, GEOTHERMAL

- 1) ART WHITE (LAWRENCE BERKELEY LAB)
- 2) ROBERT GARRELS (UNIV. OF FLORIDA)
- 3) PHIL BETHKE (USGS, RESTON)

GEOLOGY, HYDROGEOLOGY

- 1) GORDON BENNETT (USGS, RESTON)
- 2) DICK JOHNSTON (USGS, RESTON)
- 3) THURE CERLING (UTAH STATE UNIV.)
- 4) VIC BAKER (UNIV. OF TEXAS, AUSTIN)

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QA AND NRC GUIDELINES

QMP 03-01 PEER REVIEW

- o PEER REVIEWS MADE ON TECHNICAL DOCUMENTS OR PROPOSED RESEARCH (2.2)
- o RESPONSIBILITY OF WMPO BRANCH CHIEF TO INITIATE AND TO CONDUCT PEER REVIEW OR TO HAVE PEER REVIEWS CONDUCTED IN ACCORDANCE WITH THIS PROCEDURE
- o REVIEWERS ^{AAE} INDEPENDENT OF CONTRACTOR WHOSE WORK IS BEING REVIEWED
- o SELECTION OF PEER REVIEWERS MADE BY BRANCH CHIEF
- o NOTIFICATION LETTER PREPARED BY BRANCH CHIEF
- o BRANCH CHIEF SHALL DESIGNATE A CHAIRMAN TO CONDUCT MEETING

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- o CHAIRMAN'S RESPONSIBILITY TO:
 - o PREPARE AN AGENDA
 - o CONDUCT MEETINGS
 - o ISSUE REPORT ON CONSENSUS OF RECOMMENDATIONS AND COMMENTS. MINORITY OPINIONS ARE INCLUDED.
 - o SUMMARY (FROM REVIEW MEETING) LETTER FORWARDED TO BRANCH CHIEF AND THE DIRECTOR (WMPO) FOR CONCURRENCE

- o ORGANIZATION'S WORK UNDER PEER REVIEW RECEIVES SUMMARY, AND A RESPONSE IS REQUESTED BY WMPO ON A SPECIFIED DATE

- o ANY FURTHER DISAGREEMENT BETWEEN RECOMMENDATIONS AND THE ORGANIZATION'S RESPONSE IS UNILATERALLY DECIDED BY THE DIRECTOR (WMPO)

- o FORMAL REPORT INCLUDING ALL DOCUMENTATION IS ISSUED BY WMPO

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DRAFT NRC GENERIC TECHNICAL POSITION - SALIENT ASPECTS

- o ODD NUMBER OF REVIEWERS GREATER THAN 3
- o PEER REVIEWS CONFIRM THE ADEQUACY OF WORK
- o DOCUMENTED REPORT ON THE PROCEEDINGS AND FINDINGS OF THE PEER REVIEW
- o VALIDATED REPORT (SUITABILITY OF INTENDED PURPOSE)
- o PEER REVIEW SHOULD EVALUATE AND REPORT ON
 - A) VALIDITY OF ASSUMPTIONS
 - B) UNCERTAINTY IN RESULTS
 - C) ALTERNATE INTERPRETATIONS
 - D) APPROPRIATENESS AND LIMITATIONS OF METHODOLOGY AND PROCEDURES
 - E) ADEQUACY OF APPLICATION
 - F) ACCURACY OF CALCULATIONS
 - G) VALIDITY OF CONCLUSIONS

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PEER REVIEW OBJECTIVES

- o PEER REVIEWERS WILL DEVELOP AN UNDERSTANDING OF THE POTENTIAL REGULATORY/LICENSING ISSUES (SAIC)
- o PEER REVIEWERS ARE TO DISCUSS PLANS AND ONGOING WORK RELATED TO THESE DEPOSITS (STUCKLESS AND VANIMAN)
- o PEER REVIEWERS ARE TO DISCUSS AND DEVELOP AN UNDERSTANDING OF PERFORMANCE ASSESSMENT CONCERNS (SNL)
- o OBTAIN PEER REVIEW GROUP ASSESSMENT AND RECOMMENDATIONS OF THE PROPOSED PLANS AND ONGOING WORK TO ASSURE THAT THE WORK WILL ADEQUATELY RESOLVE REGULATORY/LICENSING QUESTIONS
- o OBTAIN PEER REVIEW GROUP ASSESSMENT AND RECOMMENDATIONS OF THE PROPOSED PLANS AND ONGOING WORK TO ASSURE THAT THE WORK WILL ADEQUATELY ADDRESS PERFORMANCE ASSESSMENT NEEDS

G = USGS T = SAIC A = LANL L = LLNL S = SNL

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NNWSI SCP Study Plan Report

Topic: EROSION

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.17.1.1		Distribution and Characteristics of Present and Past Erosion	G	3	8.3.1.6.1
	1.17.1.1.1	Development of Geomorphic Map of Yucca Mountain			
	1.17.1.1.2	Analysis of Downcutting History of Fortymile Wash and its Tributaries			
1.17.2.1		Influence of Future Climatic Conditions on Locations and Rates of Erosion	G	3	8.3.1.6.2
	1.17.2.1.1	Evaluation of Impact of Future Climatic Conditions on Locations and Rates of Erosion			
1.17.3.1		Evaluation of the Effects of Future Tectonic Activity on Erosion at Yucca Mountain	G	3	8.3.1.6.3
	1.17.3.1.1	Evaluation of Impact of Future Uplift or Subsidence and Faulting on Erosion at Yucca Mountain and Vicinity			

Topic: GEOCHEMISTRY

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.19.4.1		Analysis of the Effects of Tectonic Processes and Events on Rock Geochemical Properties		2	8.3.1.8.4
	1.19.4.1.1	Assessment of the Change in Rock Geochemical Properties due to Igneous Intrusions			
	1.19.4.1.2	Nature and Age of Mineralogic Change Along Faults in the Controlled Area			
	1.19.4.1.3	Assessment of the Degree of Mineral Change Along Fault Zones in 10,000 Years			
	1.19.4.1.4	Assessment of the Effects of Fault Offset on Travel Pathway			
	1.19.4.1.5	Assessment of the Degree of Mineralogic Change in the Controlled Area Resulting From Tectonic Change in Water-Table Levels			
1.14.1.1		Ground-Water Chemistry	A	3	8.3.1.3.1
	1.14.1.1.1	Saturated and Unsaturated Zone Ground Water Studies			
	1.14.1.1.2	Groundwater Chemistry Model			
1.14.7.2		Validation of Experimental Geochemistry Data	A	3	8.3.1.3.7
	1.14.7.2.1	Field Tests			
	1.14.7.2.2	Natural Analogs (Radionuclide Retardation)			
1.14.8.1		Gaseous Transport	A	3	8.3.1.3.8
	1.14.8.1.1	Gaseous Radionuclide Transport Calculations			
	1.14.8.1.2	Gaseous Radionuclide Transport Measurements			
1.14.2.1		Three-Dimensional Mineral Distributions at Yucca Mountain	A	4	8.3.1.3.2
	1.14.2.1.1	Petrologic Stratigraphy of the Topopah Spring Member			
	1.14.2.1.2	Mineral Distributions Between the Host Rock and the Accessible Environment			
	1.14.2.1.3	Fracture Mineralogy			
1.14.3.2		Kinetics and Thermodynamics of Mineral Evolution	A	4	8.3.1.3.3
	1.14.3.2.1	Kinetic Studies of Zeolite and Related Framework Silicates			
	1.14.3.2.2	Determination of End-Member Free Energies for Clinoptilolite/Heulandite, Albite, and Analcime			
	1.14.3.2.3	Solid Solution Descriptions of Clinoptilolite/Heulandite, and Analcime			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.14.4.1		Radionuclide Batch Sorption Experiments	A	4	8.3.1.3.4
	1.14.4.1.1	Batch Sorption Measurements as a Function of Solid Phase Composition			
	1.14.4.1.2	Sorption as a Function of Sorbing Element Concentration (Isotherms)			
	1.14.4.1.3	Sorption as a Function of Ground-Water Compositions			
	1.14.4.1.4	Sorption on Particulates and Colloids			
	1.14.4.1.5	Statistical Analysis of Sorption Data			
1.14.4.2		Biological Sorption and Transport	A	4	8.3.1.3.4
	1.14.4.2.1	Sorption on Microbes			
1.14.5.1		Dissolved Species Concentration Limits	A	4	8.3.1.3.5
	1.14.5.1.1	Solubility Measurements			
	1.14.5.1.2	Speciation Measurements			
	1.14.5.1.3	Solubility Modeling			
1.14.5.2		Colloid Behavior	A	4	8.3.1.3.5
	1.14.5.2.1	Colloid Formation Characterization and Stability			
	1.14.5.2.2	Colloid Modeling			
1.14.6.1		Dynamic Transport Column Experiments	A	4	8.3.1.3.6
	1.14.6.1.1	Crushed Tuff Column Experiments			
	1.14.6.1.2	Mass Transfer Kinetics			
	1.14.6.1.3	Unsaturated Tuff Column			
	1.14.6.1.4	Fractured Column Studies			
	1.14.6.1.5	Filtration			
1.14.6.2		Diffusion	A	4	8.3.1.3.6
	1.14.6.2.1	Uptake of Radionuclides on Rock Beakers in a Saturated System			
	1.14.6.2.2	Diffusion Through a Saturated Tuff Slab			
	1.14.6.2.3	Diffusion in an Unsaturated Tuff Block			
1.14.7.1		Retardation Sensitivity Analysis	A	4	8.3.1.3.7

Study Plan	Description Activity	Description	Participant	Category	SCP Section
	1.14.7.1.1	Geochemical/Geophysical Model of Yucca Mountain			
	1.14.7.1.2	Integrated Geochemical Transport Calculations			
	1.14.7.1.3	Transport Models and Related Support			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
4.7.2.5		Excavation Investigations	S	1	8.3.1.15.2
	4.7.2.5.1	Shaft Convergence			
	4.7.2.5.2	Demonstration Breakout Rooms			
	4.7.2.5.3	Sequential Drift Mining			
4.7.2.2		Laboratory Thermal Expansion Testing	S	2	8.3.1.15.2
	4.7.2.2.1	Thermal Expansion Characterization			
4.7.2.6		In Situ Thermomechanical Properties	S	3	8.3.1.15.2
	4.7.2.6.1	Heater Experiment in Unit TSw1			
	4.7.2.6.2	Canister - Scale Heater Experiment			
	4.7.2.6.3	Yucca Mountain Heated Block Tests			
	4.7.2.6.4	Thermal Stress Measurements			
4.7.2.1		Laboratory Thermal Properties	S	4	8.3.1.15.2
	4.7.2.1.1	Density and Porosity Characterization			
	4.7.2.1.2	Volumetric Heat Capacity Characterization			
	4.7.2.1.3	Thermal Conductivity Characterization			
	4.7.2.1.4	Thermal Properties From In Situ Experiments			
4.7.2.3		Laboratory Determination of Mechanical Properties of Intact Rock	S	4	8.3.1.15.2
	4.7.2.3.1	Compressive Mechanical Properties of Intact Rock at Baseline Conditions			
	4.7.2.3.2	Effects of Variable Environmental Conditions on Compressive Mechanical Properties			
	4.7.2.3.3	Tensile Strength of Unit TSw2			
4.7.2.4		Laboratory Determination of the Mechanical Properties of Fractures	S	4	8.3.1.15.2
	4.7.2.4.1	Mechanical Properties of Fractures at Baseline Test Conditions			
	4.7.2.4.2	Effects of Variable Environmental Conditions on Mechanical Properties of Fractures			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.20.2.1		Natural Resource Assessment of Yucca Mountain, Nye County, Nevada	T	2	8.3.1.9.2
	1.20.2.1.1	Geochemical Assessment of Yucca Mountain in Relation to the Potential for Mineralization			
	1.20.2.1.2	Geophysical/Geological Appraisal of the Site Relative to Mineral Resources			
	1.20.2.1.3	Assessment of the Potential for Geothermal Energy at and in the Vicinity of Yucca Mountain, Nevada			
	1.20.2.1.4	Assessment of Hydrocarbon Resources At and Near the Site			
	1.20.2.1.5	Mineral and Energy Assessment of the Site, Comparison to Known Mineralized Areas, and the Potential For Undiscovered Resources and Future Exploration			
1.20.2.2		Water Resource Assessment of Yucca Mountain, Nevada	T	2	8.3.1.9.2
	1.20.2.2.1	Projected Trends in Local and Regional Ground-Water Development and Estimated Withdrawal Rates in Southern Nevada, Proximal to Yucca Mountain			
4.8.2.1		Location of Adequate Water Supply for Construction, Operation, Closure, and Decommissioning of a Mined Geologic Disposal System at Yucca Mountain, Nevada	T	2	8.3.1.16.2
	4.8.2.1.1	Assessment of the Cost, Feasibility, and Adequacy of Wells J-12 and J-13 for Use as the Water Supply for a Mined Geologic Disposal System at Yucca Mountain, Nevada			
	4.8.2.1.2	Location of Alternative Water Supplies for a Mined Geologic Disposal System at Yucca Mountain, Nevada			
	4.8.2.1.3	Identification and Evaluation of Potential Effects of Repository-Related Water Withdrawals on the Local Flow System at Yucca Mountain, Nevada			
1.20.1.1		An Evaluation of Natural Processes That Could Affect the Long Term Survivability of the Surface Marker System at Yucca Mountain	T	3	8.3.1.9.1
	1.20.1.1.1	Synthesis of Tectonic, Seismic, and Volcanic Hazards Data from Other Site Characterization Activities			
	1.20.1.1.2	Synthesis: Evaluation of the Effects of Future Erosion and Deposition on the Survivability of the Marker System			
1.20.3.2		An Evaluation of the Potential Effects of Exploiting Natural Resources on the Hydrologic Characteristics at Yucca Mountain	T	3	8.3.1.9.3
	1.20.3.2.1	An Analysis of the Potential Effects of Future Ground-Water Withdrawals on the Hydrologic System in the Vicinity of Yucca Mountain, Nevada			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.16.1.3		Regional Terrestrial Paleocologic Studies	G	2	8.3.1.5.1
	1.16.1.3.1	Synthesis: Estimated Paleoclimate from Paleolimnology and Paleocology			
1.16.1.4		Synthesis of the Paleoenvironmental History of the Yucca Mountain Region	G	2	8.3.1.5.1
	1.16.1.4.1	Modeling of Soil Properties in the Yucca Mountain Region			
	1.16.1.4.2	Soil Moisture Analog Study			
	1.16.1.4.3	Surficial Deposits Mapping of the Yucca Mountain Area			
	1.16.1.4.4	Eolian History of the Yucca Mountain Region			
	1.16.1.4.5	Synthesis: Paleoenvironment from Quaternary Geomorphology, Surficial Deposits, and Soils			
1.16.2.2		Characterization of the Future Regional Hydrology Due to Climate Changes	G	3	8.3.1.5.2
	1.16.2.2.1	Analysis of Future Surface Hydrology due to Climate Changes			
	1.16.2.2.2	Analysis of Future Unsaturated Zone Hydrology due to Climate Changes			
	1.16.2.2.3	Synthesis of the Effects of Possible Future Recharge Due to Climate Changes on Hydrology			
1.17.4.1		Identification of the Potential Effects of Erosion on Hydrologic Characteristics	G	3	8.3.1.6.4
	1.17.4.1.1	Evaluation of the Impact of Future Erosion on Hydrologic Characteristics at Yucca Mountain and Vicinity			
1.19.3.1		Analysis of the Effects of Tectonic Processes and Events on Flux Rates	T	3	8.3.1.8.3
	1.19.3.1.1	Annual Probability of Volcanic or Igneous Events in the Controlled Area			
	1.19.3.1.2	Effects of Volcanic or Igneous Events on Flux			
	1.19.3.1.3	Assessment of the Effects of Igneous Intrusions and Volcanic Events on Flux Rates			
	1.19.3.1.4	Faulting Rates, Recurrence Intervals, and Probable Cumulative Offset in 10,000 years			
	1.19.3.1.5	Effects of Faulting on Flux Rates			
	1.19.3.1.6	Assessment of the Effects of Faulting on Flux Rates			
	1.19.3.1.7	Probability of Changing Dip by >2 Degrees in 10,000 Years by Folding			
	1.19.3.1.8	Probability of Exceeding 30 Meters of Elevation Change in 10,000 Years			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
	1.19.3.1.9	Assessment of the Effects of Folding, Uplift, and Subsidence on Flux Rates			
1.16.2.1		Characterization of the Quaternary Regional Hydrology	G	4	8.3.1.5.2
	1.16.2.1.1	Regional Paleoflood Evaluation			
	1.16.2.1.2	Quaternary Unsaturated Zone Hydrochemical Analysis			
	1.16.2.1.3	Evaluation of Past Discharge Areas			
	1.16.2.1.4	Analog Recharge Studies			
	1.16.2.1.5	Hydrogenic Deposits with Emphasis on Opaline Silica Types			

Topic: IGNEOUS ACTIVITY

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.19.5.1		Characterization of Local Volcanic Features	A	2	8.3.1.8.1
	1.19.5.1.1	Volcanism Drillholes			
	1.19.5.1.2	Potassium-Argon Dating Method Age Determinations			
	1.19.5.1.3	Core Samples			
	1.19.5.1.4	Characterization of Hydrovolcanic Eruptions			
	1.19.5.1.5	Structural Patterns, Southwest NTS			
	1.19.5.1.6	Detailed Mapping Around Young Volcanic Centers			
4.9.1.1		Literature Survey Regarding Quaternary Silicic Volcanic Centers in the Western Great Basin	A	2	8.3.1.17.1
	4.9.1.1.1	Potential for Ash Fall at the Site			
	4.9.1.1.2	Assess Ash Fall Thickness at the Site			
	4.9.1.1.3	Assess Particulate Size and Distribution for Potential Ash Flow at the Site			
1.19.1.1		Probability of a Volcanic Eruption Penetrating the Repository	A	3	8.3.1.8.1
	1.19.1.1.1	Location and Timing of Volcanic Events			
	1.19.1.1.2	Evaluation of Structural Controls on Volcanism			
	1.19.1.1.3	Presence of Magma Bodies in the Vicinity of the Site			
	1.19.1.1.4	Probability Calculations and Assessment			
1.19.1.2		Effects of Volcanic Eruption Penetrating the Repository	A	3	8.3.1.8.1
	1.19.1.2.1	Effects of Strombolian Eruptions			
	1.19.1.2.2	Effects of Hydrovolcanic Eruptions			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.16.1.1		Characterization of the Present Regional Climate and Environments	G	2	8.3.1.5.1
	1.16.1.1.1	Synoptic Regional Climate			
1.16.1.2		Regional Paleolimnologic Studies	G	2	8.3.1.5.1
	1.16.1.2.1	Climate Implications of Paleolimnology			
	1.16.1.2.2	Climatic Implications of Paleoenvironment			
2.10.1.1		Characterize the Meteorological Conditions in the Vicinity of the Site	T	2	8.3.1.12.1
	2.10.1.1.1	Identify and Evaluate Existing Meteorological Data Bases and Describe Meteorological Conditions of the Vicinity			
2.10.2.1		Meteorological Data Collection at the Yucca Mountain Site	T	2	8.3.1.12.2
	2.10.2.1.1	Site Meteorological Monitoring Program			
	2.10.2.1.2	Data Manipulation for Input to Dispersion Analyses			
2.10.4.1		Characterize the Potential Extreme Weather Phenomena and Their Recurrence Intervals	T	2	8.3.1.12.4
	2.10.4.1.1	Document Extreme Conditions and Meteorological Design Parameters			
1.16.1.6		Characterization of the Future Regional Climate and Environments	G	3	8.3.1.5.1
	1.16.1.6.1	Global Circulation Model			
	1.16.1.6.2	Feasibility Study: Regional Climate Model			
	1.16.1.6.3	Integrated Global/Regional Climate Modeling			
	1.16.1.6.4	Empirical Climate Modeling			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.15.2.2		Characterization of the Structural Features Within the Site Area	G	1	8.3.1.4.1
	1.15.2.2.1	Geologic Mapping of Zonal Features in the Paintbrush Tuff at a Scale of 1:12,000			
	1.15.2.2.2	Surface-Fracture Network Studies			
	1.15.2.2.3	Borehole Evaluation of Faults and Fractures			
	1.15.2.2.4	Geologic Mapping of the Exploratory Shaft and Drifts			
	1.15.2.2.5	Fracture Mineralogy Studies of the Exploratory Shaft and Drifts			
	1.15.2.2.6	Vertical Seismic Profiling Studies in the Exploratory Shaft and Drifts			
1.15.2.1		Characterization of the Vertical and Lateral Distribution of Stratigraphic Units Within the Site Area	G	2	8.3.1.4.1
	1.15.2.1.1	Surface and Subsurface Stratigraphic Studies of the Host Rock and Surrounding Units			
	1.15.2.1.2	Surface-Based Geophysical Surveys			
	1.15.2.1.3	Borehole Geophysical Surveys			
	1.15.2.1.4	Petrophysical Properties Testing			
	1.15.2.1.5	Paleomagnetic and Stratigraphic Correlations			
4.7.3.1		Characterization of the Site Ambient Stress Conditions	G	2	8.3.1.15.3
	4.7.3.1.1	Anelastic Strain Recovery Experiments in Core Holes			
1.15.2.3		Development of Three-Dimensional Models of the Site	G	3	8.3.1.4.1
	1.15.2.3.1	Development of a Three-Dimensional Geologic Model of the Site Area			
1.15.2.4		To Be Determined	S	3	
	1.15.2.4.1	Development of a Computer-Based Three-Dimensional Model of Rock Properties at the Repository Site			
4.7.3.3		Characterization of the Site Ambient Thermal Conditions	G	4	8.3.1.15.3
	4.7.3.3.1	Surface-Based Evaluation of Ambient Thermal Conditions			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
4.6.2.1	Exploration Program		S	2	8.3.1.14.2
	4.6.2.1.1	Site Reconnaissance			
	4.6.2.1.2	Preliminary Exploration			
	4.6.2.1.3	Detailed Exploration			
4.6.2.2	Laboratory Tests and Test Properties		S	2	8.3.1.14.2
	4.6.2.2.1	Physical Property and Index Laboratory Tests			
	4.6.2.2.2	Mechanical and Dynamic Laboratory Property Tests			
4.6.2.3	Field Tests and Characterization Measurements		S	2	8.3.1.14.2
	4.6.2.3.1	Physical Property Field Tests and Characterization Measurements			
	4.6.2.3.2	Mechanical Property Field Tests			
	4.6.2.3.3	Geophysical Field Measurements			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.13.1.1		Characterizations of the Regional Meteorology	G	4	8.3.1.2.1
	1.13.1.1.1	Precipitation and Meteorological Monitoring			
1.13.1.2		Characterization of Runoff and Streamflow	G	4	8.3.1.2.1
	1.13.1.2.1	Surface-Water Runoff Monitoring			
	1.13.1.2.2	Transport of Debris by Severe Runoff			
4.8.1.1		Characterization of Flood Potential of the Yucca Mountain Site	G	4	8.3.1.16.1
	4.8.1.1.1	Site Flood and Debris Hazards Studies			

Topic: SEAL MATERIALS

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.12.2.1	Seal Material Development Plan		S	3	8.3.3.2.2
1.12.2.1.1	Initial Properties Determination of Potential Sealing Materials				
1.12.2.1.2	Durability of a Surface Cover				
1.12.2.1.3	A Dissolution Model of a Fault Seal				
1.12.2.1.4	A Degradational Model for Cementitious Materials Emplaced in a Tuff Environment				
1.12.2.1.5	Thermodynamic Properties of a Sealing Material - Tuff System				
1.12.2.1.6	Detailed Property Determination of Cementitious - Based Material Suitable for a Tuffaceous Environment				
1.12.2.1.7	Hydraulic Conductivity and Consolidation Testing of Crushed Tuff				

Topic: SATURATED ZONE HYDROLOGY

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.13.1.4		Regional Hydrologic System Synthesis and Modeling	G	2	8.3.1.2.1
	1.13.1.4.1	Conceptualization of Regional Hydrologic Flow Models			
	1.13.1.4.2	Subregional Two-Dimensional Areal Hydrologic Modeling			
	1.13.1.4.3	Subregional Two-Dimensional Cross-Sectional Hydrologic Modeling			
	1.13.1.4.4	Regional Three-Dimensional Hydrologic Modeling			
1.13.3.2		Characterization of the Site Saturated Zone Hydrochemistry	G	2	8.3.1.2.3
	1.13.3.2.1	Assessment of Site Hydrochemical Data Availability and Needs			
	1.13.3.2.2	Hydrochemical Characterization of Water in the Upper Part of the Saturated Zone			
1.13.3.3		Saturated Zone Hydrologic System Synthesis and Modeling	G	2	8.3.1.2.3
	1.13.3.3.1	Conceptualization of Saturated Zone Flow Models Within the Boundaries of the Accessible Environment			
	1.13.3.3.2	Development of Fracture Network Model			
	1.13.3.3.3	Calculation of Flow Paths, Fluxes, and Velocities Within the Saturated Zone to the Accessible Environment			
1.13.1.3		Characterization of the Regional Ground Water Flow System	G	4	8.3.1.2.1
	1.13.1.3.1	Assessment of the Regional Hydrogeologic Data Needs in the Saturated Zone			
	1.13.1.3.2	Regional Potentiometric Level Studies			
	1.13.1.3.3	Fortymile Wash Recharge Study			
	1.13.1.3.4	Evapotranspiration Studies			
	1.13.1.3.5	Regional Hydrochemical Tests and Analyses			
1.13.3.1		Characterization of the Site Saturated Zone Ground Water Flow System	G	4	8.3.1.2.3
	1.13.3.1.1	Solitario Canyon Fault Study in the Saturated Zone			
	1.13.3.1.2	Site Potentiometric Level Evaluation			
	1.13.3.1.3	Analysis of Previously Completed Hydraulic-Stress Tests			
	1.13.3.1.4	Multiple-Well Interference Testing			
	1.13.3.1.5	Testing at the C-Hole Sites with Conservative Tracers			
	1.13.3.1.6	Well Testing with Conservative Tracers Throughout the Site			
	1.13.3.1.7	Testing at the C-Hole Sites with Reactive Tracers			
	1.13.3.1.8	Well Testing with Reactive Tracers throughout the Site			

Topic: TECTONICS

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.19.5.2		Characterization of Regional Volcanic Features	G	2	8.3.1.8.2
	1.19.5.2.1	Evaluation of the Genesis of Quaternary Basalts			
	1.19.5.2.2	Evaluation of Depth of Curie Temperature Isotherm			
	1.19.5.2.3	Chemical and Physical Changes Around Dikes (USGS?)			
4.9.2.1		Fault Potential at the Repository	S	2	8.3.1.17.2
	4.9.2.1.1	Assess the Potential for Surface Rupture at the Prospective Sites of Surface Facilities			
	4.9.2.1.2	Assess the Potential for Rupture on Faults that Intersect Underground Facilities			
4.9.3.1		Relevant Earthquake Sources	G	2	8.3.1.17.3
	4.9.3.1.1	Identify Relevant Earthquake Sources			
	4.9.3.1.2	Define Exceptional Earthquakes for Relevant Earthquake Sources			
4.9.3.2		Underground Nuclear Explosion (UNE) Sources	S	2	8.3.1.17.3
	4.9.3.2.1	Determine the Range of UNE Sources			
	4.9.3.2.2	Determine Maximum UNE Sources			
4.9.3.3		Ground Motion from Regional Earthquakes and UNEs	G	2	8.3.1.17.3
	4.9.3.3.1	Select or Develop Empirical Models for Earthquake Motions			
	4.9.3.3.2	Select or Develop Empirical Models for UNEs			
4.9.3.4		Effects of Local Site Geology on Surface and Subsurface Motions	G	2	8.3.1.17.3
	4.9.3.4.1	Analyze Ground Motion Recordings for Site Effects			
	4.9.3.4.2	Model Site Effects Using the Wave Properties of the Local Geology			
4.9.3.5		Ground Motion at the Site from Controlling Seismic Events	G	2	8.3.1.17.3
	4.9.3.5.1	Identify Controlling Seismic Events			
	4.9.3.5.2	Characterize Ground Motion from the Controlling Seismic Events			

Topic: TECTONICS

Study Plan	Description Activity	Description	Participant	Category	SCP Section
4.9.3.6		Probabilistic Seismic Hazards Analyses	S	2	8.3.1.17.3
	4.9.3.6.1	Earthquake Sources			
	4.9.3.6.2	Calculate Ground Motion Probabilities			
4.9.4.1		Historic and Current Seismicity	G	2	8.3.1.17.3
	4.9.4.1.1	Compile Historical Earthquake Record			
	4.9.4.1.2	Monitor Current Seismicity			
	4.9.4.1.3	Evaluate Effect of Human Activities on Earthquake Occurences Near the Site			
4.9.4.3		Faulting within 100 km of Yucca Mountain	G	2	8.3.1.17.3
	4.9.4.3.1	Evaluation of the Nature of Geologic Boundary and Location with Respect to NTS			
	4.9.4.3.2	Evaluation of the Nature, Frequency, and Distribution of Quaternary Faults within 100 km of the Site			
	4.9.4.3.3	Evaluate Cedar Mountain Earthquake			
	4.9.4.3.4	Evaluate Bare Mountain Frontal Zone			
	4.9.4.3.5	Estimate Rate, Density, and Amplitude of Quaternary Faulting in the Structural Domain of the Site			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
4.9.4.10	Geodetic Leveling		G	2	8.3.1.17.3
	4.9.4.10.1	Relevel Base-Station Network, Yucca Mountain and Vicinity			
	4.9.4.10.2	Conduct GPS Survey of Selected Base-Stations, Yucca Mountain and Vicinity			
	4.9.4.10.3	Analyze Existing Releveling Data, Yucca Mountain and Vicinity			
4.9.4.11	Characterization of Regional Lateral Crustal Movement		G	2	8.3.1.17.3
	4.9.4.11.1	Analysis of Lateral Component of Crustal Movement Based on Historical Faulting, Seismicity, and Trilateration Surveys			
4.9.4.12	Tectonic Model Synthesis		G	2	8.3.1.17.4
	4.9.4.12.1	Analyze Tectonic Processes and Long-Term Tectonic Stability at the NTS and Vicinity			
	4.9.4.12.2	Rationalize Stress and Strain at NTS and Vicinity with Plate-Tectonic Setting			
	4.9.4.12.3	Evaluate Tectonic Disruptive Scenarios (NTS and Vicinity)			
4.9.4.4	Investigation of Left-Lateral Strike-Slip Faulting on Northeast-Trending Systems		G	2	8.3.1.17.3
	4.9.4.4.1	Evaluate Rock Valley Fault System			
	4.9.4.4.2	Evaluate Mine Mountain Fault System			
	4.9.4.4.3	Evaluate Stagecoach Road Fault Zone			
	4.9.4.4.4	Evaluate Cane Springs Fault			
4.9.4.5	Detachment Faults in and Adjacent to NTS		G	2	8.3.1.17.3
	4.9.4.5.1	Evaluate Calico Hills Area			
	4.9.4.5.2	Evaluate Beatty-Bare Mountain Area			
	4.9.4.5.3	Evaluate Specter Range and Camp Desert Rock Areas			
	4.9.4.5.4	Evaluate Age of Detachment Surfaces Based on Radiometric Ages			
	4.9.4.5.5	Analyze Theoretical Stress Distribution			
4.9.4.6	Faulting at the Site		G	2	8.3.1.17.3
	4.9.4.6.1	Map Quaternary Faults at the Site			
	4.9.4.6.2	Evaluation of Age and Recurrence of Movement on Suspected and Known Quaternary Faults in and near the Site			

Study Plan	Description Activity	Description	Participant	Category	SCP Section
	4.9.4.6.3	Identify Structural Domains of the NTS Region			
4.9.4.7	Evaluate Subsurface Geometry and Concealed Extensions of North-Trending Systems in the Yucca Mountain Area		G	2	8.3.1.17.3
	4.9.4.7.1	Evaluation of the Present Regional Stress Field			
	4.9.4.7.2	Evaluation of the Stability of Regional Stress Field			
4.9.4.8	Regional Stress Field and its Bearing on the Orientation and Style of Future Fault Movement		G	2	8.3.1.17.3
	4.9.4.8.1	Define and Date Ancient Surfaces			
	4.9.4.8.2	Define Areas of Late Quaternary and Holocene Uplift and Subsidence			
	4.9.4.8.3	Analyze Regional Morphometry and Morphology			

Topic: UNSATURATED ZONE HYDROLOGY

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.13.2.10		Unsaturated Zone System Analysis and Integration	G	2	8.3.1.2.2
	1.13.2.10.1	Conceptualization of the Unsaturated Zone Hydrologic Flow System			
	1.13.2.10.2	Numerical Simulation of the Concepts			
	1.13.2.10.3	System Integration			
1.13.2.4		Diffusion Tests in the Exploratory Shaft	G	2	8.3.1.2.2
	1.13.2.4.1	Characterization of Flux Within the Paintbrush Nonwelded Unit in the Vicinity of the Ghost Dance Fault			
1.13.2.8		Unsaturated Zone Flow and Transport Modeling	G	2	8.3.1.2.2
	1.13.2.8.1	Preliminary Numerical Modeling of the Site Hydrogeologic System			
	1.13.2.8.2	Simulation of the Natural Hydrogeologic System			
	1.13.2.8.3	Stochastic Modeling and Uncertainty Analysis			
1.13.2.9		To Be Determined	S	2	8.3.1.2.2
	1.13.2.9.1	Laboratory Validation Experiments			
	1.13.2.9.1.1	Laboratory Validation Experiments			
	1.13.2.9.1.2	Hydrologic Property Measurements			
4.8.3.1		Determination of Preclosure Hydrologic Conditions in the Unsaturated Zone at Yucca Mountain, Nevada	G	3	8.3.1.16.3
	4.8.3.1.1	Synthesis of Data from Issue 1.13 for Determination of Preclosure Hydrologic Conditions in the Unsaturated Zone at Yucca Mountain			
1.13.2.1		Characterization of Unsaturated Zone Infiltration	G	4	8.3.1.2.2
	1.13.2.1.1	Evaluation of Natural Infiltration			
	1.13.2.1.2	Characterization of Hydrologic Properties of Surficial Materials			
	1.13.2.1.3	Artificial Infiltration			
	1.13.2.1.4	Water Movement Tracer Tests			
	1.13.2.1.4.1	Chloride and Chloride 36 Measurements of Infiltration at Yucca Mountain			
1.13.2.2		Characterization of Percolation in the Unsaturated Zone - Surface Based	G	4	8.3.1.2.2

Study Plan	Description Activity	Description	Participant	Category	SCP Section
	Studies				
	1.13.2.2.1	Matrix Hydrologic Properties Testing			
	1.13.2.2.2	Site Vertical Borehole Studies			
	1.13.2.2.3	Solitario Canyon Horizontal Borehole Study			
1.13.2.3	Characterization of Percolation in the Unsaturated Zone - Exploratory Shaft Facility Investigations		G	4	8.3.1.2.2
	1.13.2.3.1	Intact-Fracture Test in the Exploratory Shaft Facility			
	1.13.2.3.2	Infiltration Test in the Exploratory Shaft Facility			
	1.13.2.3.3	Bulk-Permeability Test in the Exploratory Shaft Facility			
	1.13.2.3.4	Radial-Borehole Tests in the Exploratory Shaft Facility			
	1.13.2.3.5	Excavation-Effects Test in the Exploratory Shaft Facility			
	1.13.2.3.6	Calico Hills Test in the Exploratory Shaft Facility			
	1.13.2.3.7	Perched-Water Test in the Exploratory Shaft Facility			
	1.13.2.3.8	Diffusion Tests in the Exploratory Shaft Facility			
	1.13.2.3.9	Hydrochemistry Tests in the Exploratory Shaft Facility			
1.13.2.6	Characterization of Gaseous-Phase Movement in the Unsaturated Zone		G	4	8.3.1.2.2
	1.13.2.6.1	Gas-Phase Circulation Study			
1.13.2.7	Hydrochemical Characterization of the Unsaturated Zone		G	4	8.3.1.2.2
	1.13.2.7.1	Gaseous-Phase Chemical Investigations			
	1.13.2.7.2	Aqueous-Phase Chemical Investigations			

Topic: WASTE PACKAGE

Study Plan	Description Activity	Description	Participant	Category	SCP Section
1.10.4.4		Engineered Barrier System Field Tests	L	3	8.3.4.2.4
	1.10.4.4.1	Repository Horizon Near-Field Hydrologic Properties			
	1.10.4.4.2	Repository Horizon Rock-Water Interactions			
	1.10.4.4.3	Numerical Analysis of fluid Flow and Transport in the Repository Horizon Near-Field Environment			
1.10.4.1		Characterization of Chemical and Mineralogic Changes in the Post-Emplacement Environment	L	4	8.3.4.2.4
	1.10.4.1.1	Rock-Water Interaction at Elevated Temperatures			
	1.10.4.1.2	Effect of Grout and Concrete and Other Repository Materials on Water Composition			
	1.10.4.1.3	Composition of Waste Package Environment Vadose Water			
	1.10.4.1.4	Dissolution of Phases in the Waste Package Environment			
	1.10.4.1.5	Effects of Radiation on Water Chemistry			
	1.10.4.1.6	Effects of Container and Borehole Liner Corrosion Products on Water Chemistry			
	1.10.4.1.7	Numerical Analysis and Modeling of Rock-Water Interaction			
1.10.4.2		Hydrologic Properties of Waste Package Environment	L	4	8.3.2.4.2
	1.10.4.2.1	Single Fluid Phase System			
	1.10.4.2.2	Two-Phase System			
	1.10.4.2.3	Numerical Analysis of Flow and Transport in Laboratory Systems			
1.10.4.3		Thermal and Mechanical Attributes of the Waste Package Environment	L	4	8.3.4.2.4
	1.10.4.3.1	Waste Package Environment Thermal Field Analysis			
	1.10.4.3.2	Near-Field Rock Mechanical Properties			

STATUS OF STUDY PLAN LIST

- CURRENTLY APPROXIMATELY 100 STUDY PLANS
 - INCREASE IN NUMBER OF STUDY PLANS IN RESPONSE TO OGR GUIDANCE: ONE STUDY PLAN FOR EACH SCP STUDY UNDER INVESTIGATIONS IN 8.3

- REVISED CATEGORIES PER OGR
 - 1 EXPLORATORY SHAFT STUDY PLANS
 - 2 FIRST YEAR AFTER SCP RELEASE
 - 3 SECOND YEAR AND BEYOND
 - 4 PRE SCP
 - ONGOING

STATUS OF STUDY PLAN LIST (CONTINUED)

- REVISED LIST OF STUDY PLANS DUE TO HQ ON 4/24/87
 - LIST OF ES STUDY PLANS WILL NOT CHANGE
 - REMAINING STUDY PLANS TENTATIVE PENDING FINAL PO AND HQ REVIEW OF 8.3
 - LIST SHOULD INCLUDE COMBINED STUDY PLANS (LOGICAL COLLECTION)
 - INCLUDES A BRIEF DESCRIPTION (PARAGRAPH) ON EACH ES STUDY PLAN

4/23/87
PM/TPO MEETING

OGR FINAL STUDY PLAN REVIEW AND APPROVAL PROCEDURE

<u>TOTAL WEEKS</u>		PO SUBMITS 10 COPIES OF STUDY PLAN TO OGR
	1 WEEK	TECH BRANCH DETERMINATION IF STUDY PLAN IS ACCEPTABLE FOR REVIEW
	1	STUDY PLAN DISTRIBUTED FOR REVIEW
	2 WEEKS	REVIEW BY TECH BRANCH, ENG BRANCH, GEOSCIENCES BRANCH, PROJECT MGMT BRANCH, SITING, LIC & QA DIV, OFC OF ENV GUIDANCE, OFC OF GENERAL COUNSEL WESTON AND NATIONAL LABORATORIES
	3	HQ COMMENT CONSOLIDATION MEETING
	1 WEEK	HQ/PO COMMENT RESOLUTION MEETING
4	2 WEEKS	PO REVISES STUDY PLAN

4/23/87
PM/TPO MEETING

OGR FINAL STUDY PLAN REVIEW AND APPROVAL PROCEDURE (CONTINUED)

6	REVISED STUDY PLAN TO OGR DIRECTOR, ENG AND GEOTECHNICAL BRANCH APPROVES STUDY; DIRECTOR, SITING, LICENSING, QA TRANSMITS STUDY PLAN TO NRC
7	NRC REVIEW
19	DOE NOTIFIED OF SERIOUS PROBLEMS NRC REVIEW PO REVISES STUDY PLANS
31	FINAL NRC COMMENTS PO/HQ MEET TO PLAN COMMENT RESOLUTION PO REVISES STUDY PLAN
34	

PROBLEMS WITH HQ REVIEW AND APPROVAL PROCEDURE

- PREVIOUS CONCERNS ON HQ DRAFT PROCEDURE NOT ADDRESSED
 - STUDY PLAN IS A HQ DOCUMENT
 - LEVEL OF REVIEW APPROPRIATE FOR SCP - NOT STUDY PLAN
 - WHEN CAN AN ACTIVITY BEGIN
 - 3 MONTHS AFTER SUBMITTAL TO NRC?
 - PO/HQ STAFF RESOURCES TO COMPLETE STUDY PLANS

4/23/87
PM/TPO MEETING

PROBLEMS WITH HQ REVIEW AND APPROVAL PROCEDURE (CONTINUED)

● NEW CONCERNS

- REVISIONS TO SCP HQ CONTROLLED
- SUBSTANTIVE (?) REVISIONS APPROVED BY HQ-FOLLOW REVIEW AND APPROVAL PROCEDURE FOR A NEW STUDY PLAN
- [IMPACT ON REVISION ON ONGOING WORK]
- CONFLICTING GUIDANCE: CATEGORIES
8.3 STUDIES REQUIRING A STUDY PLAN
- LACK OF GUIDANCE: EXEMPTIONS
EXPLORATORY SHAFT TEST PLANS
COMPILATION OF STUDY PLANS

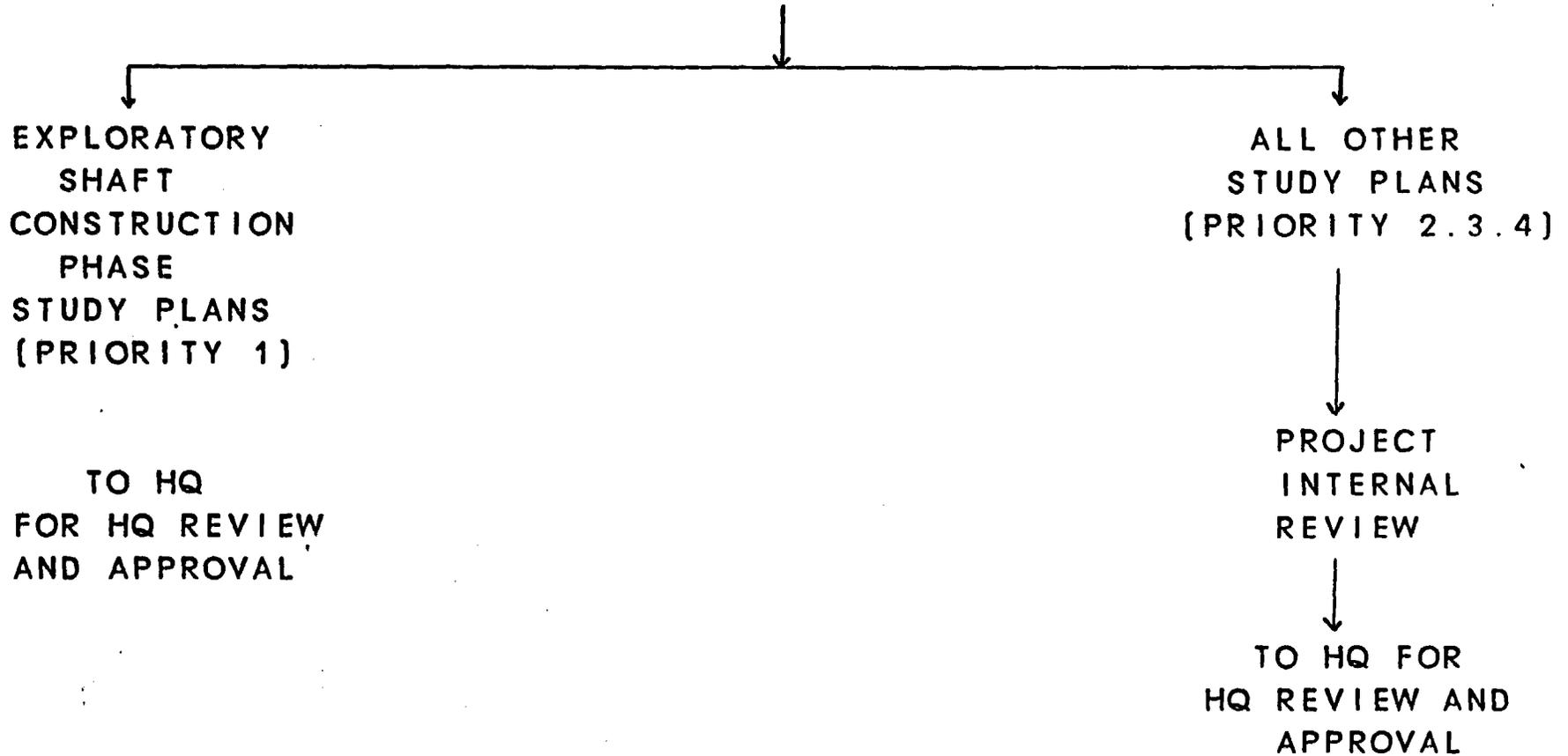
4/23/87
PM/TPO MEETING

- REVISE SITE CHARACTERIZATION PLAN MANAGEMENT PLAN (SCPMP) TO ACCOMMODATE STUDY PLAN PREPARATION AND REVIEW
 - REVISE CONTENT TO INCLUDE STUDY PLAN PREPARATION AND REVIEW
 - MINIMIZE LEVEL OF DETAIL TO ENCOMPASS RESPONSIBILITIES AND A GENERAL PLAN FOR STUDY PLAN MANAGEMENT
 - DEVELOP PROCEDURES TO IMPLEMENT REVIEW CYCLES AS NECESSARY TO SUPPORT SCHEDULE CHANGES
 - IMPLEMENTATION OF OGR CONTROLLED DOCUMENT CONCEPT AS REQUIRED

4/23/87
PM/TPO MEETING

STUDY PLAN REVIEW PROCESS

PARTICIPANT SUBMITS
DRAFT STUDY PLAN
TO WMPO

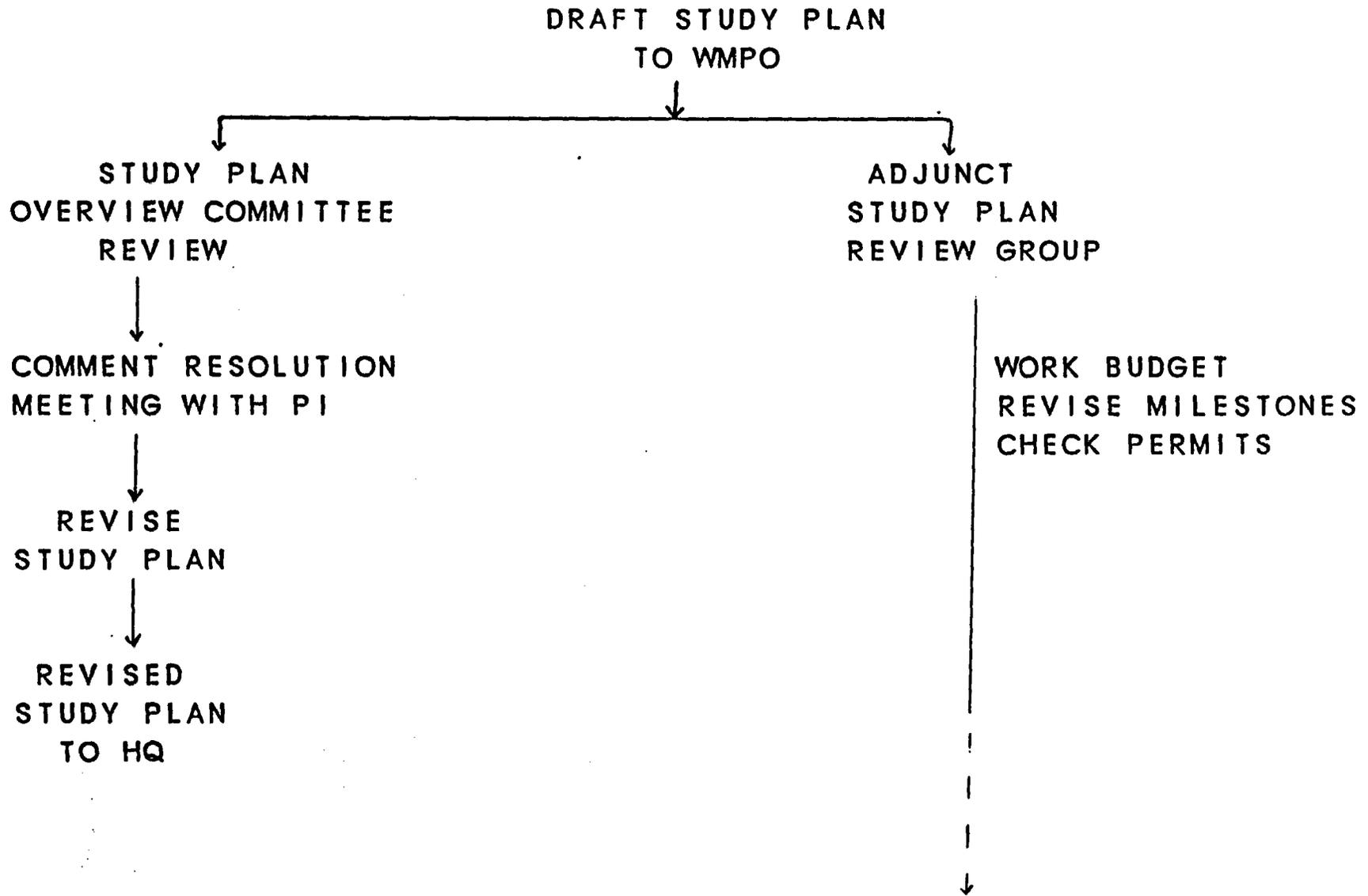


PROJECT INTERNAL REVIEW

- STUDY PLAN OVERVIEW COMMITTEE - CORE GROUP
 - CONSISTENCY WITH 8.3 ISSUE RESOLUTION STRATEGY:
DESIGN/PERFORMANCE ASSESSMENT
 - CONSISTENCY WITH QUALITY ASSURANCE LEVEL ASSIGNMENTS FOR
EACH ACTIVITY
QUALITY ASSURANCE/SITE MANAGEMENT AND INTEGRATION

- ADJUNCT STUDY PLAN REVIEW GROUP
 - ENVIRONMENTAL
 - SCHEDULES AND MILESTONES
 - BUDGET PER ACTIVITY (INCLUDING FIELD COSTS)

PROJECT INTERNAL REVIEW CYCLE



4/23/87
PM/TPO MEETING

STOP WORK ORDER STATUS

USGS STOP WORK ORDER STATUS

ISSUED: APRIL 28, 1986, RESULT OF WMPO AUDIT 86-2 AND SURVEILLANCE 86-23

CONDITIONS TO RESUME WORK:

- o PROPOSED CORRECTIVE ACTIONS AND SCHEDULES FOR COMPLETION OF AUDIT FINDINGS APPROVED BY WMPO.
- o QAPP REVISED AND APPROVED BY WMPO.
- o INDOCTRINATION AND TRAINING COMPLETE.
- o PLAN TO PROVIDE ADEQUATE QA COVERAGE.
- o ASSIGNMENT OF QA LEVELS COMPLETED AND APPROVED BY WMPO.

STATUS:

- o THE FIRST FOUR CONDITIONS IDENTIFIED ABOVE HAVE BEEN SATISFIED.
- o THE STOP WORK ORDER WILL BE LIFTED INCREMENTALLY WITH WMPO APPROVAL OF THE USGS SIPS AND ASSOCIATED QA LEVELS.
- o THREE (3) SIPS HAVE BEEN APPROVED BY WMPO. ONE (1) SIP IS IN THE FORMAL WMPO APPROVAL CYCLE. TWENTY SEVEN SIPS ARE IN PROCESS OF INFORMAL REVIEW. AWAITING SUBMITTAL OF FOUR (4) SIPS.

SAIC/LANL/LLNL STOP WORK ORDER STATUS

ISSUED: JUNE 10, 1986, AS A RESULT OF WMPO SURVEILLANCE 86-21, 86-24, AND 86-25.

CONDITION TO RESUME WORK:

- o ASSIGNMENT OF QA LEVELS COMPLETE AND APPROVED BY WMPO.

STATUS:

SAIC:

- o SAIC STOP WORK ORDER WAS RESCINDED MARCH 1987.

LOS ALAMOS:

- o LANL STOP WORK ORDER WAS RESCINDED NOVEMBER 1986.

LLNL:

- o FIVE (5) SIPs HAVE BEEN APPROVED BY WMPO. WORK IS AUTHORIZED TO PROCEED.
- o THERE ARE FIVE (5) SIPs REMAINING WHICH REQUIRE SUBMITTAL FOR WMPO APPROVAL.

SNL STOP WORK ORDER STATUS

ISSUED: JUNE 10, 1986, AS A RESULT OF SURVEILLANCE 86-024.

CONDITIONS TO RESUME WORK:

- o WMPO APPROVAL OF THE SNL QAPP
- o ASSIGNMENT OF QA LEVELS COMPLETE AND APPROVED BY WMPO

STATUS:

- o SNL STOP WORK ORDER WAS RESCINDED DECEMBER 1986.

REECO STOP WORK ORDER STATUS

ISSUED: OCTOBER 31, 1986, AS A RESULT OF WMPO AUDIT 86-3.

CONDITIONS TO RESUME WORK:

- o WMPO APPROVAL OF PROPOSED AUDIT FINDING CORRECTIVE ACTIONS
- o WMPO APPROVAL OF THE REECO QAPP
- o COMPLETION OF INDOCTRINATION AND TRAINING OF REECO PERSONNEL

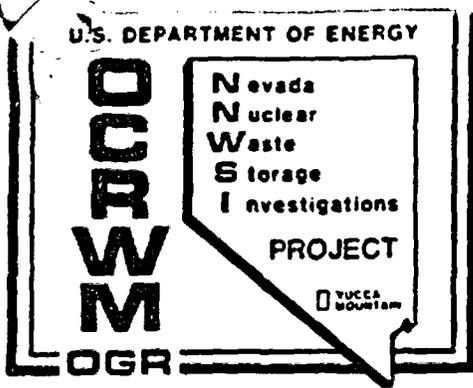
STATUS:

- o REECO STOP WORK ORDER WAS RESCINDED JANUARY 1987.

NRC MINI AUDITS

- o DURING JULY 1986 THE DOE IDENTIFIED THE POSSIBILITY OF NRC CONDUCTING AUDITS OF DISCRETE AREAS OF THE NNWSI PROJECT TECHNICAL PROGRAM. THESE AUDITS WERE TO BE CONDUCTED PRIOR TO THE MAJOR NRC AUDIT OF THE PROJECT PRIOR TO THE START OF THE SINKING OF THE EXPLORATORY SHAFT.
- o IN NOVEMBER 1986 THE NNWSI PROJECT IDENTIFIED FIVE (5) PERTINENT SUBJECT AREAS FOR NRC TO CONDUCT MINI AUDITS ON.
- o AT A MEETING WITH THE NRC, OGR, AND NNWSI PROJECT OA IN JANUARY 1987, IT WAS AGREED THAT THE NRC WOULD CONDUCT THE FIRST MINI AUDIT ON THE MINERALOGY AND PETROLOGY WORK BEING PERFORMED BY LANL.
- o NRC AND OGR HELD A MANAGEMENT MEETING IN MARCH 1986 TO DISCUSS THE PROTOCOL FOR THE MINI AUDIT. THE MAJOR OUTCOMES WERE AS FOLLOWS:
 - NRC WOULD CONDUCT A SCOPING VISIT TO LANL PRIOR TO THE MINI AUDIT.
 - DOE IS TO PROVIDE NRC A COPY OF THE MINERALOGY/PETROLOGY TECHNICAL PROCEDURES IN ORDER FOR NRC TO DEVELOP A CHECKLIST.
 - NRC WOULD PROVIDE DOE WITH A COPY OF THE CHECKLIST OF THE AUDIT DURING THE AUDIT.
 - DOE WILL PROVIDE NRC JUSTIFICATION ON WHICH THE DOE FEELS THEY ARE READY FOR AN AUDIT BY THE NRC.
- o THE SCOPING MEETING WAS HELD BETWEEN WMPO, NRC, AND LANL ON APRIL 15, 1987, AT LANL. THE MAJOR OUTCOMES WERE AS FOLLOWS:
 - NRC MINI AUDITS ARE NOT CONSIDERED AN APPENDIX 7 MEETING.
 - THE AUDIT TEAM WILL CONSIST OF 8 NRC REPRESENTATIVES - 3 NRC OA, 1 NRC OA CONSULTANT, 1 NRC SITE REPRESENTATIVE, 2 NRC TECHNICAL, AND 1 NRC TECHNICAL CONSULTANT.

- OBSERVERS WOULD BE LIMITED TO 1 STATE, 1 OGR, AND 2 WMPO REPRESENTATIVES.
 - INTERACTION WITH STATE OBSERVERS WOULD BE AN NRC RESPONSIBILITY.
 - THE PROGRAMMATIC AUDIT SCOPE WOULD INCLUDE ALL 18 CRITERIA EXCEPT THE FOLLOWING: RECORDS, FIELD COLLECTION OF SAMPLES, AND QA SOFTWARE.
 - THE TECHNICAL SCOPE WOULD INCLUDE DISCUSSION ON WHY ONE METHOD/TEST/EQUIPMENT WAS BEING USED VERSUS ANOTHER IN ADDITION TO IMPLEMENTATION/ANALYSIS/EVALUATIONS ASSOCIATED WITH THE IDENTIFIED METHOD/TEST/EQUIPMENT.
 - COPIES OF 12 TECHNICAL PROCEDURES UNDER DEVELOPMENT WERE GIVEN TO THE NRC. THIS IS IN ADDITION TO 8 THAT HAVE BEEN ISSUED.
 - COPIES OF LANL INTERNAL AUDIT 8704 AND THE SDRS FROM THE WMPO 87-1 AUDIT WERE GIVEN TO THE NRC. A BLANK COPY OF THE WMPO CHECKLIST WILL BE PROVIDED TO NRC.
 - FORMAT OF THE OUTPUT (REPORT) WAS NOT TOTALLY AGREED UPON.
- o THE NRC MINI AUDIT IS BEYOND THE SCOPE OF THE EXISTING MANAGEMENT AGREEMENTS BETWEEN NV AND THE OTHER FIELD OFFICES.



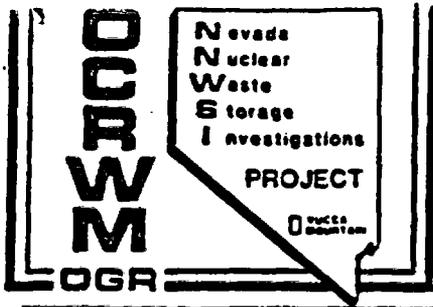
Los Alamos

FLUIDS AND MATERIALS IN THE ESF

TPO MEETING PRESENTATION

April 23, 1987

Gerald L. DePoorter



FLUIDS AND MATERIALS IN THE ESF

Los Alamos

**FLUIDS AND MATERIALS
ISSUE**

**Identify possible impacts of fluids
and materials used during**

Site characterization

ESF construction and operation

on

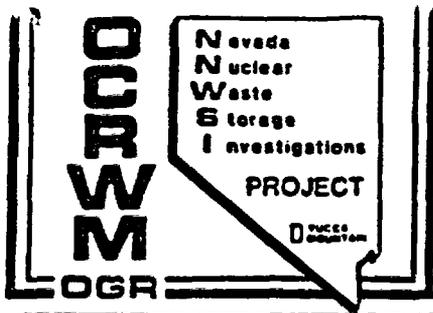
Site characterization results

ES Experiments

Waste Package performance

Repository performance

AND



FLUIDS AND MATERIALS IN THE ESF

Los Alamos

**Identify possible impacts of
fluids and materials used
during repository construction,
operation, and closing**

on

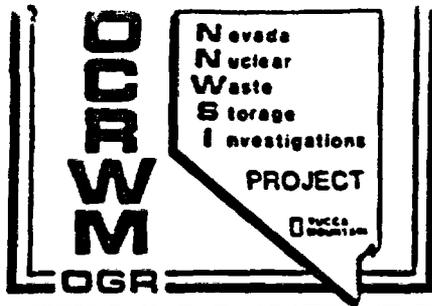
Waste Package performance

Repository performance

Performance confirmation testing

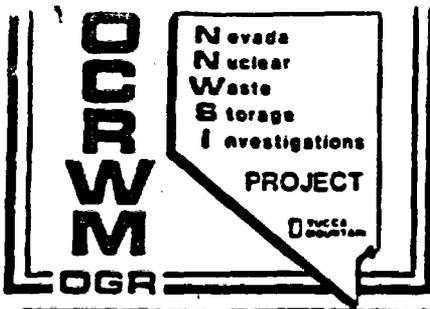
If necessary

**Specify alternate materials for
the ESF and repository**



OUTLINE OF PRESENTATION

- o SUMMARY SCHEDULE FOR RESOLUTION**
- o TECHNICAL ISSUES**
- o RESOLUTION STRATEGY**
- o DETAILS OF RESOLUTION**
- o SCHEDULE AND CONTINGENCIES**



FLUIDS AND MATERIALS IN THE ESF

Los Alamos

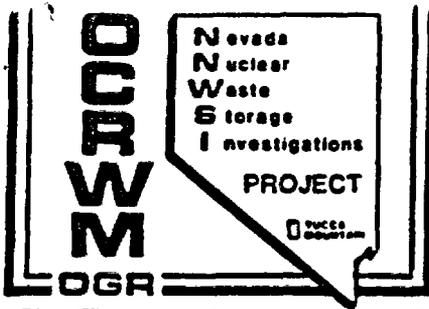
SUMMARY SCHEDULE FOR RESOLUTION ESF ISSUES

**SNL will complete preliminary
calculations by June 12, 1987.**

**If calculations show no problems
exist:**

**Agree to specifications to be
incorporated into ESF design
documents.**

Issue draft report in August.



FLUIDS AND MATERIALS IN THE ESF

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SUMMARY SCHEDULE FOR RESOLUTION ESF ISSUES

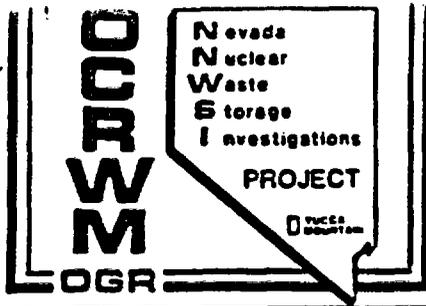
**If calculations show no problems
exist: (Continued)**

Issue final report in October.

**If calculations show problems
may exist:**

**Further detailed calculations
required.**

No time estimate for resolution.



FLUIDS AND MATERIALS IN THE ESF

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TECHNICAL ISSUES

**Deleterious effects of added
fluids and materials on:**

ES Experiments

Bulk Permeability

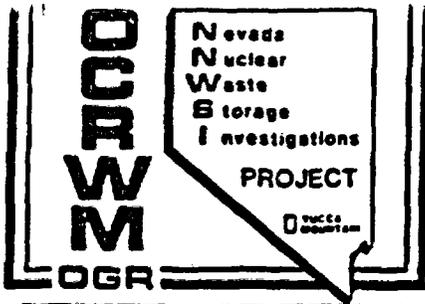
Infiltration

**Other permeability
measurements**

Site Characterization Activities

Surface based Hydrology tests

Waste Package performance



FLUIDS AND MATERIALS IN THE ESF

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TECHNICAL ISSUES

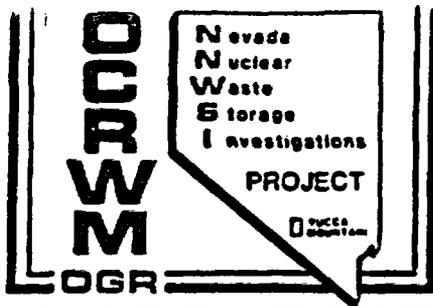
(Continued)

**Deleterious effects of added
fluids and materials on:**

Repository performance

Water chemistry changes

Microbiological effects



FLUIDS AND MATERIALS IN THE ESF

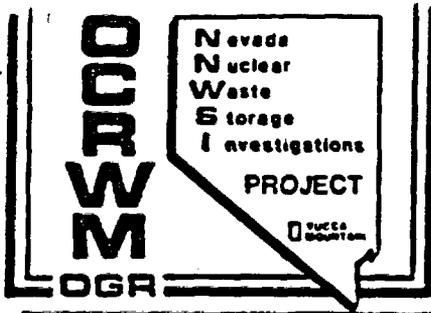
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RESOLUTION STRATEGY

- A. Determine identity, amount, and location of introduction of fluids and materials used in the ESF and repository construction and operation.**

- B. Evaluate effects of introduced fluids and materials on:**
 - 1. ES Experiments**

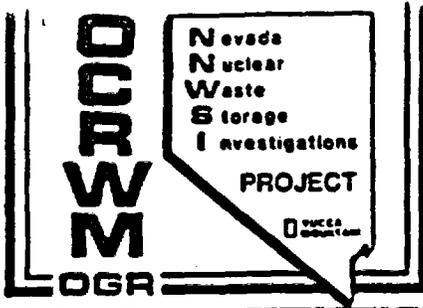
 - 2. Site Characterization activities**



RESOLUTION STRATEGY

(Continued)

- 3. Waste Package performance**
 - 4. Repository performance**
- C. Identification of alternatives, if necessary.**



FLUIDS AND MATERIALS IN THE ESF

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DETAILS OF RESOLUTION

SUMMARY OF ACCOMPLISHMENTS TO DATE

**SUMMARY OF RESPONSES TO
INFORMATION REQUESTS**

REFERENCE NUMBERS OF INTEREST

DISCUSSION OF RESOLUTION OF ESF ISSUES

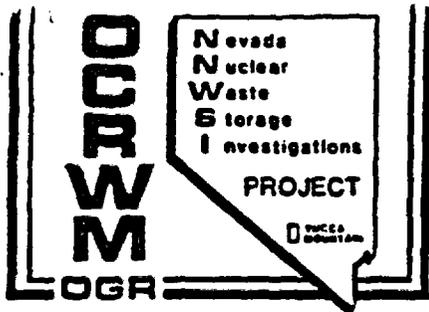
**DISCUSSION OF RESOLUTION OF OTHER
SITE CHARACTERIZATION ISSUES**

**DISCUSSION OF RESOLUTION OF
REPOSITORY ISSUES**



**SUMMARY OF
ACCOMPLISHMENTS
TO DATE**

- A. Compiled data base on fluids and materials.**
- B. Compiled data base on microorganisms.**
- C. Distributed data bases to project participants and requested updates.**



FLUIDS AND MATERIALS IN THE ESF

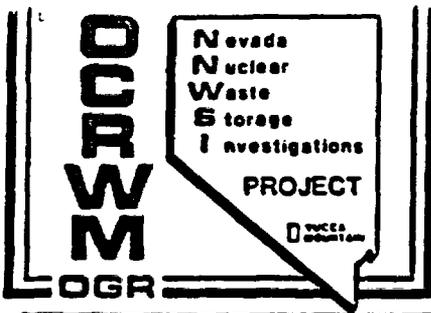
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SUMMARY OF ACCOMPLISHMENTS TO DATE

(Continued)

- D. Requested specification of detrimental changes through WMPO from project participants.**

- E. Arranged with SNL for performance calculations.**

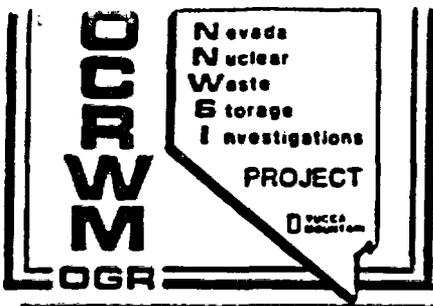


**SUMMARY OF RESPONSES
TO INFORMATION
REQUESTS**

**(Response to WMPO letter of
January 21, 1987)**

- A. LLNL provided quantitative limits to water chemistry alteration.**

- B. USGS provided rationale for dry mining of the infiltration and bulk permeability test rooms in the ESF.**



FLUIDS AND MATERIALS IN THE ESF

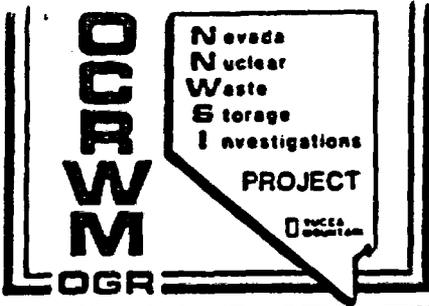
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INFORMATION REQUESTS

(Continued)

- C. REECO provided an update of the Usable Fluids Study.**

- D. SAIC indicated they would be introducing no fluids into the ESF.**



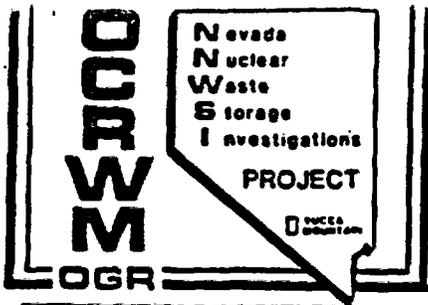
FLUIDS AND MATERIALS IN THE ESF

Los Alamos

REFERENCE NUMBERS OF INTEREST

WATER NOW CONTAINED IN YUCCA MOUNTAIN

<u>UNIT</u>	<u>WATER</u>	
	<u>GALLONS</u>	<u>ACRE-FEET</u>
TIVA CANYON	1.96×10^9	6.01×10^3
PAINTBRUSH	2.73×10^{10}	8.39×10^4
TOPOPAH SPRING	3.32×10^{10}	1.02×10^5
CALICO HILLS	1.30×10^{11}	3.98×10^5
TOTALS	1.92×10^{11}	5.90×10^5



FLUIDS AND MATERIALS IN THE ESF

Los Alamos

REFERENCE NUMBERS OF INTEREST

AVERAGE ANNUAL RAINFALL AT YUCCA MOUNTAIN

5.9 INCHES/YEAR OVER AN AREA OF 1520 ACRES IS

2.44×10^8 GALLONS/YEAR

OR

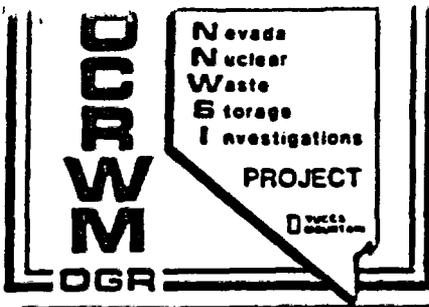
747 ACRE-FEET/YEAR

**5.9 INCHES/YEAR OVER AN AREA OF 20.9 ACRES
FOR THE ES SURFACE FACILITY IS**

3.35×10^6 GALLONS/YEAR

OR

10.3 ACRE FEET/YEAR



FLUIDS AND MATERIALS IN THE ESF

Los Alamos

ESF ISSUES

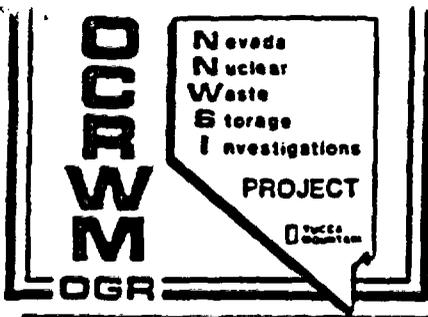
EFFECTS OF ADDED FLUIDS ON EXPERIMENTS

EFFECTS OF ADDED FLUIDS AND MATERIALS ON REPOSITORY PERFORMANCE

Possible Groundwater Chemistry

Changes due to Cement

Microbial Activity

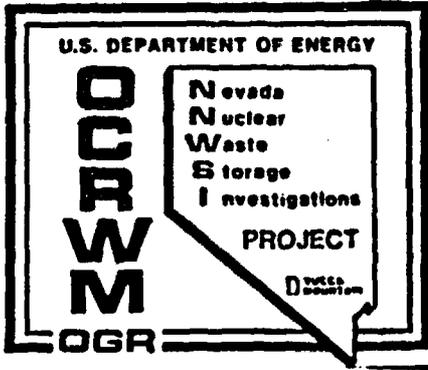


FLUIDS AND MATERIALS IN THE ESF

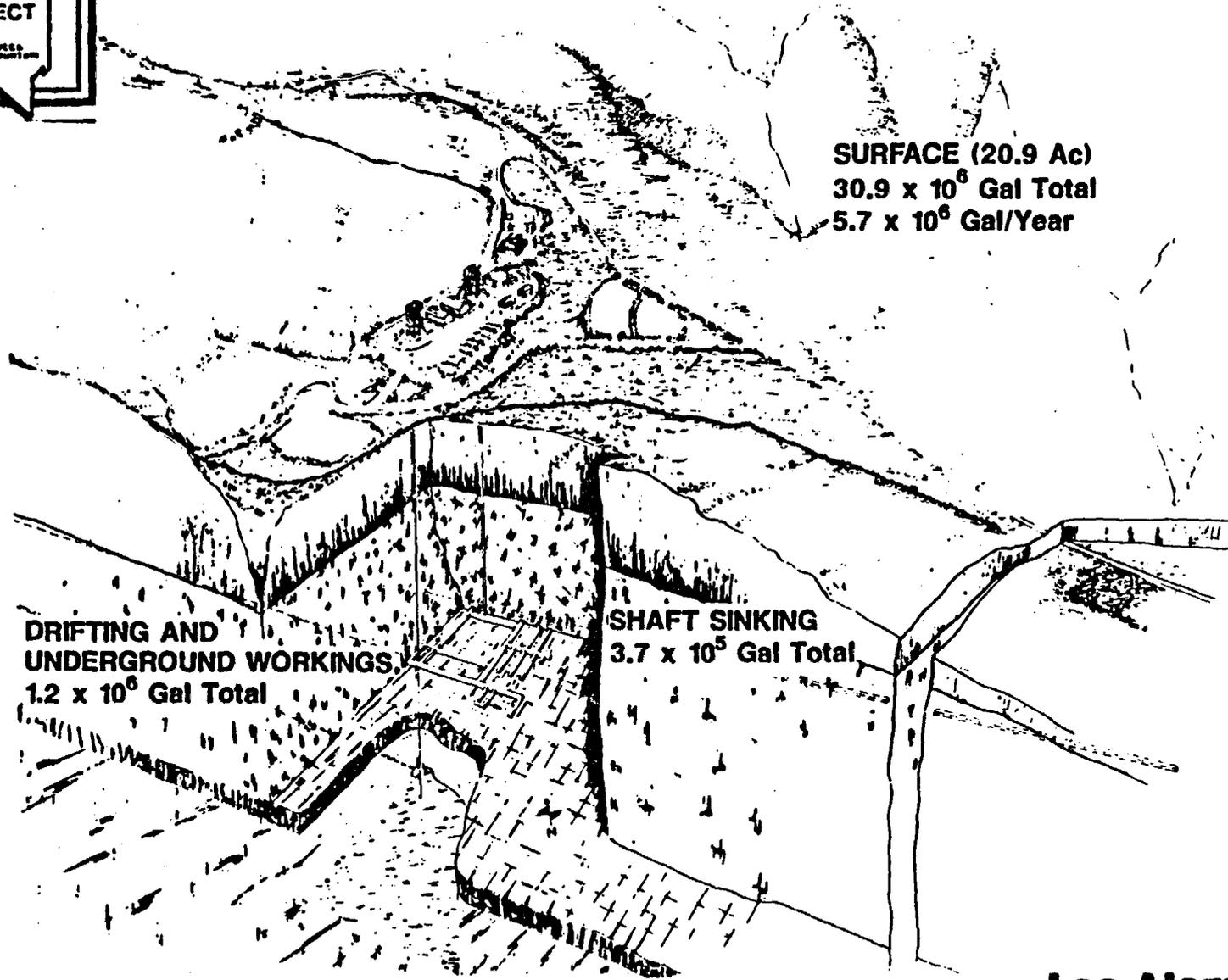
Los Alamos

INPUT FROM PARTICIPANTS TO BE CONSIDERED ON EVALUATION OF ADDED FLUIDS AND MATERIALS ON ES EXPERIMENTS

- 1) USGS RATIONALE FOR DRY MINING
OF INFILTRATION AND BULK
PERMEABILITY TESTS
- 2) SNL AND LLNL ANALYSES OF USGS
RATIONALE



FLUIDS AND MATERIALS IN THE ESF

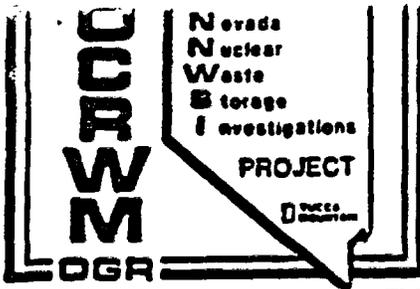


SURFACE (20.9 Ac)
 30.9×10^6 Gal Total
 5.7×10^6 Gal/Year

**DRIFTING AND
UNDERGROUND WORKINGS**
 1.2×10^6 Gal Total

SHAFT SINKING
 3.7×10^5 Gal Total

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FLUIDS AND MATERIALS IN THE ESF

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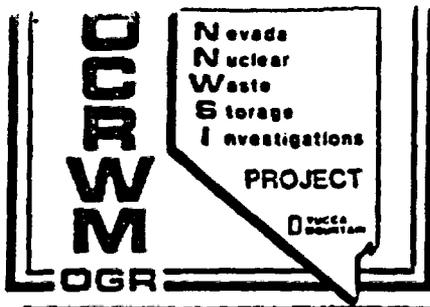
WATER CONTAINED IN ROCK REMOVED FOR ESF CONSTRUCTION AND OPERATION

**SINKING 2 SHAFTS 14 FEET IN DIAMETER,
1,100 FEET DEEP AND 1,480 FEET DEEP**

3.5×10^5 Gallons

DRIVING 9,600 FEET OF DRIFTS

1.5×10^6 Gallons



FLUIDS AND MATERIALS IN THE ESF

Los Alamos

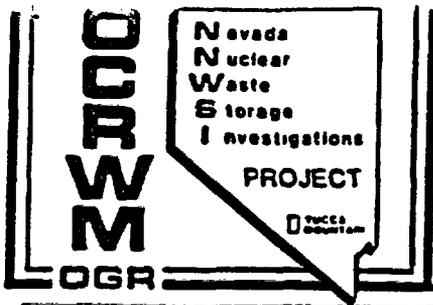
SNL CALCULATIONS ON WATER ADDED DURING SHAFT SINKING

CALCULATIONS FOR TWO SCENARIOS:

1. 90% OF ADDED WATER
REMOVED WITH MUCK
2. 95% OF ADDED WATER
REMOVED WITH MUCK

REMAINING WATER ASSUMED TRAPPED
BEHIND SHAFT LINER

SNL WILL CALCULATE REDISTRIBUTION OF
WATER NEAR SHAFT LINER

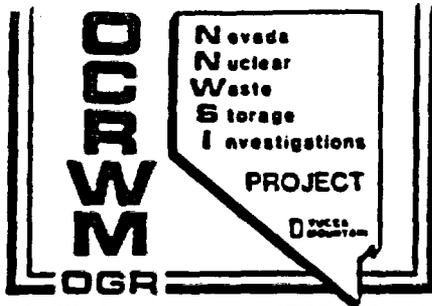


FLUIDS AND MATERIALS IN THE ESF

Los Alamos

DETERMINATION OF EFFECTS OF CONCRETE SHAFT LINER ON WASTE PACKAGE PERFORMANCE

- 1) **EXTENSION OF SNL CALCULATIONS OF WATER DISTRIBUTION NEAR SHAFT TO CALCIUM TRANSPORT. DETERMINE IF CALCIUM CAN BE TRANSPORTED FROM SHAFT LINER TO VICINITY OF WASTE PACKAGES.**
- 2) **DETERMINATION OF CALCIUM SOLUBILITY NEAR CONCRETE-TUFF INTERFACE.**
- 3) **EVALUATION OF BUFFERING CAPACITY OF HOST ROCK.**



FLUIDS AND MATERIALS IN THE ESF

Los Alamos

SNL CALCULATIONS ON WATER ADDED DURING DRIFTING

CALCULATIONS FOR TWO SCENARIOS:

- 1. 90% OF ADDED WATER
REMOVED WITH MUCK**
- 2. 95% OF ADDED WATER
REMOVED WITH MUCK**

**SNL WILL CALCULATE DISTRIBUTION OF
WATER NEAR DRIFT WALLS**

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OPERATION

FLUIDS AND MATERIALS IN THE ESF

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OGR

SITE CHARACTERIZATION ISSUES

**EFFECTS OF DRILLING ON CHARACTERIZATION
OF THE UNSATURATED ZONE**

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Waste
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REECO
CORPORATION

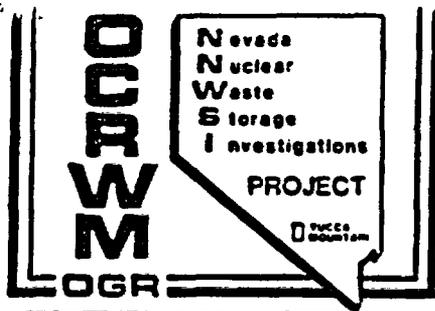
FLUIDS AND MATERIALS IN THE ESF

Los Alamos

DRILLING FLUID LOST IN THE PROPOSED REPOSITORY BLOCK

(From REECO Drilling Logs)

HOLE	QUANTITY (Gallons)	CHARACTERISTICS
USW H-3	582,000	Detergent/Water 1:60
USW G-4	322,000	Detergent/Water 1:325
USW H-5	712,000	Detergent/Water 1:141
USW G-1	2,600,000	Polymer
USW H-4	No data	Polymer



FLUIDS AND MATERIALS IN THE ESF

Los Alamos

REPOSITORY ISSUES

WATER CHEMISTRY CHANGES DUE TO ADDED MATERIALS

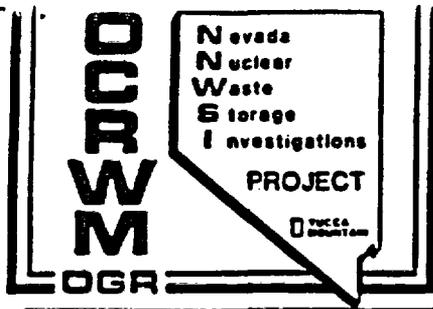
Effects on Waste Package

Effects on Speciation and Solubility

MICROBIAL ACTIVITY

Effects on Transport

Effects on Water Chemistry



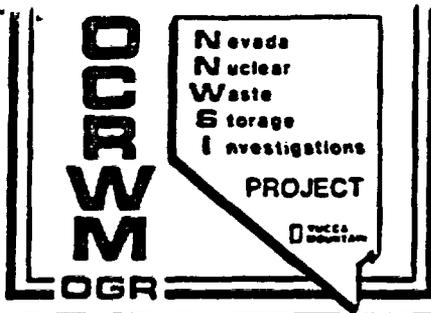
FLUIDS AND MATERIALS IN THE ESF

Los Alamos

DETERMINATION OF WATER CHEMISTRY CHANGES DUE TO ADDED MATERIALS

- 1) EVALUATION OF NATURAL SPATIAL
VARIATION IN GROUNDWATER
COMPOSITIONS**

- 2) COMPARISON OF EXPECTED CHANGES
FROM ADDED MATERIALS WITH NATURAL
SPATIAL VARIATION**



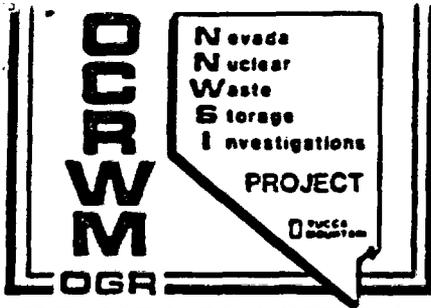
**NATURAL SPATIAL VARIATION IN
GROUNDWATER COMPOSITION**

- 1) MEASUREMENT OF WATER FROM BULLFROG
UNIT SATURATED ZONE IN H-6, H-5, H-1,
AND UE25b#1**

- 2) EXPERIMENTAL MEASUREMENT OF
CONTACTING J-13 WATER WITH TUFF
(LANL SORPTION TASKS)**

- 3) PRELIMINARY USGS RESULTS ON
UNSATURATED ZONE WATER COMPOSITIONS**

- 4) MEASURED VARIATION IN RAINIER
MESA PORE WATER**



**COMPARISON OF EXPECTED CHANGES IN
GROUNDWATER CHEMISTRY DUE TO
ADDED MATERIALS WITH NATURAL
SPATIAL VARIATION**

- 1) DETERMINATION OF CALCIUM SOLUBILITY
AT GROUT/CEMENT TUFF INTERFACE**
- 2) EVALUATION OF BUFFERING CAPACITY OF
HOST ROCK**
- 3) SNL CALCULATIONS TO DETERMINE IF
CALCIUM COULD BE TRANSPORTED FROM
ROCK BOLTS TO THE VICINITY OF THE
WASTE PACKAGE**

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FLUIDS AND MATERIALS IN THE ESF

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MICROBIAL ACTIVITY

- 1) MICROBES CAN DEGRADE
DRILLING FLUIDS**
- 2) MICROBES FROM YUCCA
MOUNTAIN SORB PU(IV)**
- 3) MICROBES INFLUENCE COLLOID
AGGLOMERATION**

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PROJECT

ESF MATERIALS AND FLUIDS RESOLUTION

UPDATE- 3/26/87

Los Alamos

TASK	1986			1987									
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
LETTER TO VIETH/TPOs	x												
EXISTING DATA BASE-FLUIDS	—												
EXISTING DATA BASE-MICROBES	—												
DELAY IN INFO REQUEST			—										
UPDATE AND CONCERNS				LLNL, REECo, USGS, SAIC									
REQUEST SNL PA						—							
SNL PERFORMANCE ASSESSMENT						—							
PROJECT REVIEW									—				
PREPARE DRAFT REPORT										—			
PROJECT REVIEW AND COMMENT											—		
PREPARE FINAL REPORT												—	x

REAL PROBLEM (?)



U.S. DEPARTMENT OF ENERGY

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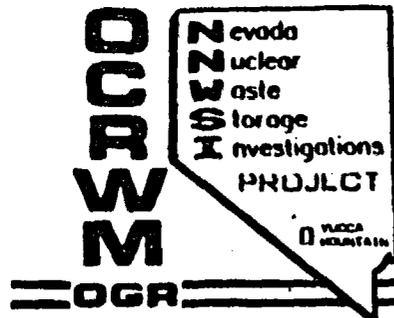
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PROJECT

**YUCCA
MOUNTAIN**

OGA

**REVIEW/ACCEPTANCE/APPROVAL
OF
NNWSI PROJECT DOCUMENTS & REVISIONS THERETO**

**DRAFT PROCEDURES CURRENTLY UNDER CONSIDERATION
AP 1.3Q (ALL PROJECT PARTICIPANTS)
QMP 06-03 (INTERNAL TO WMPO)**



WHY THESE PROCEDURES ARE NECESSARY

IMPLEMENTATION OF QUALITY ASSURANCE REQUIREMENTS

[NNWSI QAP NVO 196-17 REV. 5]

o INTRODUCTION, PARAGRAPH 2.5

"WMPO DIRECTOR IS RESPONSIBLE FOR...ASSESSING PROGRESS TOWARD THE ATTAINMENT OF PROJECT GOALS."

"WMPO DIRECTOR IS RESPONSIBLE FOR...COMPLIANCE WITH LAWS, REGULATIONS AND DOE POLICIES."

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PROJECT

YUCCA MOUNTAIN

o SECTION VI. PARAGRAPH 1.2. "DOCUMENT CONTROL"

"IMPLEMENTATION OF DOCUMENT CONTROL SHALL PROVIDE FOR THE FOLLOWING:

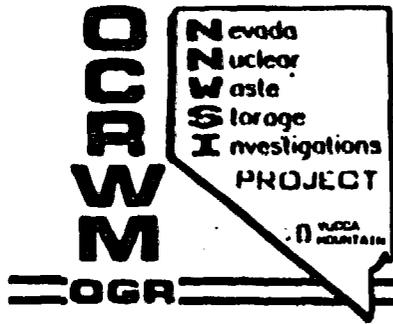
- IDENTIFICATION OF DOCUMENTS TO BE CONTROLLED
- IDENTIFICATION OF ASSIGNMENT OF RESPONSIBILITY FOR PREPARING, REVIEWING, APPROVING AND ISSUING DOCUMENTS
- REVIEW OF DOCUMENTS FOR ADEQUACY, COMPLETENESS AND CORRECTNESS PRIOR TO APPROVAL AND ISSUANCE."



o SECTION VII, PARAGRAPH 1.7.1, "CONTROL OF PURCHASED ITEMS & SERVICES"

"...THE PURCHASER SHALL ACCEPT THE SERVICE BY ANY ONE OR A COMBINATION OF THE FOLLOWING METHODS:

- TECHNICAL VERIFICATION OF DATA
- SURVIELLANCE, AUDIT OR BOTH
- REVIEW OF OBJECTIVE EVIDENCE FOR CONFORMANCE TO PROCUREMENT DOCUMENT REQUIREMENTS."



AP 1.3Q AND QMP 06-03

ESTABLISH THE METHODS OF IMPLEMENTATION

AP 1.3Q WILL DIRECT NNWSI PROJECT PARTICIPANTS & WMPO REGARDING:

- o IDENTIFICATION OF DOCUMENTS & REVISIONS REQUIRING WMPO REVIEW/ACCEPTANCE/APPROVAL
- o IDENTIFICATION OF THE WMPO & THE T&MSS PERSONNEL DOCUMENTS & REVISIONS ARE TO BE SUBMITTED TO
- o PROCEDURAL DESCRIPTION OF:
 - SUBMITTAL OF DOCUMENTS
 - DISPOSITION OF DOCUMENTS BY THE WMPO:
 - RESOLUTION OF COMMENTS
 - RESOLUTION OF DISPUTES
 - QA RECORDS

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OGR

QMP 06-03 WILL:

- DEFINE RESPONSIBILITIES WITHIN THE WMPO & T&MSS WITH RESPECT TO THE REVIEW, ACCEPTANCE, OR APPROVAL OF DOCUMENTS & REVISIONS
- IDENTIFY & DEFINE THE TYPES OF REVIEWS REQUIRED FOR EACH DOCUMENT OR DOCUMENT TYPE & REVISION
- IDENTIFY THE OGR, DOE/NV, & WMPO PERSONNEL WHO MUST ACCEPT/APPROVE EACH DOCUMENT & REVISION
- PROVIDE PROCEDURAL DESCRIPTION OF:
 - T&MSS COORDINATION OF DOCUMENT REVIEW/ACCEPTANCE/APPROVAL CYCLE
 - DOCUMENTATION OF REVIEW COMMENTS
 - ACCEPTANCE/APPROVAL MEASURES
 - RESOLUTION OF COMMENTS (MIRROR OF AP 1.3)
 - RESOLUTION OF DISPUTES (MIRROR OF AP 1.3)
 - QA RECORDS

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PROJECT

WUCA
HOUNTAIN

OGA

TYPES OF DOCUMENT REVIEWS

DEFINITIONS PROVIDED
IN THE PRE-MEETING
MATERIAL
SEE QMP-06-03

MANAGEMENT

REGULATORY

QUALITY ASSURANCE

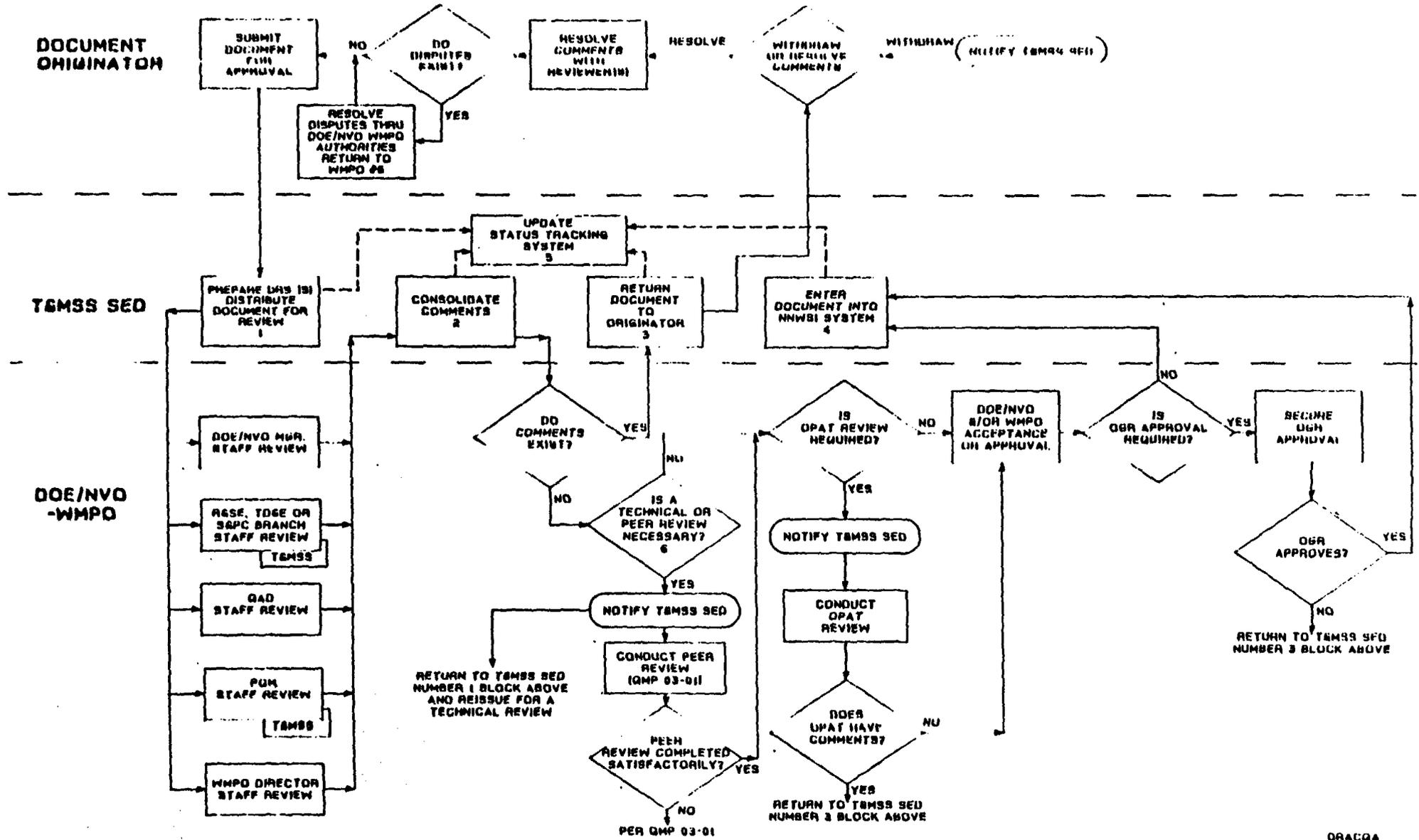
MILESTONE CRITERIA

TECHNICAL

OPAT

PEER (SEE QMP-03-01)

DOCUMENT REVIEW/APPROVAL CYCLE



**EXHIBIT 1
DOCUMENT REVIEW/ACCEPTANCE/APPROVAL**

<u>DOCUMENT NAME OR TYPE</u>	<u>REVIEWS REQUIRED</u>	<u>REVIEW STAFF ASSIGNED</u>	<u>OGR, NV & WMPO AUTHORITIES REQUIRED ACCEPTANCE/APPROVAL</u>
NNNSI PROJECT PLAN	MANAGEMENT	A & B	APPROVAL - WMPO DIRECTOR DOE/NV MGR.
NNNSI PROJECT MANAGEMENT PLAN	MANAGEMENT	A & B	APPROVAL - WMPO DIRECTOR DOE/NV MGR.
NNNSI QUALITY ASSURANCE PLAN	MANAGEMENT QUALITY ASSURANCE	A G, H & I	APPROVAL - WMPO DIRECTOR PQM OGR ASSOC. DIR.
SITE CHARACTERIZATION PLAN	MANAGEMENT	A, B, C, D, H	APPROVAL - WMPO DIRECTOR OGR ASSOC. DIR.
ESF MANAGEMENT PLAN	MANAGEMENT QUALITY ASSURANCE MILESTONE CRITERIA	A, B, C G C	APPROVAL - WMPO DIRECTOR DOE/NV MGR.
SYSTEMS ENGINEERING MANAGEMENT PLAN	MANAGEMENT QUALITY ASSURANCE REGULATORY	A, B, C, D, E, H G D	APPROVAL - WMPO DIRECTOR DOE/NV MGR. OGR ASSOC. DIR.
CONFIGURATION MANAGEMENT PLAN	MANAGEMENT QUALITY ASSURANCE REGULATORY MILESTONE CRITERIA	A, B, C, D, E G D E	APPROVAL - WMPO DIRECTOR DOE/NV MGR.

LEGEND FOR REVIEW STAFF ASSIGNED

- | | |
|------------------------------------|---------------------------------|
| A - WMPO DIRECTOR STAFF | F - OPAI STAFF |
| B = DOE/NV MGR. STAFF | G = WMPO PQM STAFF (&/or T&MSS) |
| C = TD&E BRANCH STAFF (&/or T&MSS) | H = OGR STAFF |
| D = R&SE BRANCH STAFF (&/or T&MSS) | I = QAD STAFF |
| E = S&PC BRANCH STAFF (&/or T&MSS) | |

EXHIBIT 1
DOCUMENT REVIEW/ACCEPTANCE/APPROVAL

OCR, NV & WMPO AUTHORITIES
REQUIRED ACCEPTANCE/APPROVAL

<u>DOCUMENT NAME OR TYPE</u>	<u>REVIEWS REQUIRED</u>	<u>REVIEW STAFF ASSIGNED</u>	<u>REQUIRED ACCEPTANCE/APPROVAL</u>
PARTICIPANT WORK PLANS	MANAGEMENT	C, D OR E AS APPROPRIATE	APPROVAL - WMPO BRANCH CHIEF
REVIEW SHEETS FOR ACCEPTANCE OF DATA OR DATA INTERPETATIONS	MANAGEMENT QUALITY ASSURANCE	C, D OR E AS APPROPRIATE G	ACCEPTANCE - WMPO PQM WMPO BRANCH CHIEF
TECHNICAL REPORTS AND PUBLICATIONS	MANAGEMENT QUALITY ASSURANCE REGULATORY OPAT MILESTONE CRITERIA	A & C, D, OR E G D C, D OR E AS APPROPRIATE	ACCEPTANCE - BRANCH CHIEF CONCURRENCE - OPAT

DOCUMENT REVIEW SHEET

<p>DOCUMENT ORIGINATOR _____</p> <p>DOCUMENT NO. _____ REV. NO. _____ DATE _____</p> <p>DOCUMENT TITLE _____</p> <p>NAME OF REVIEWER _____ COMMENTS REQ'D BY: _____ date _____</p> <p>DISPUTE CORRESPONDENCE _____</p>	<p style="text-align: center;"><u>TYPE OF REVIEW REQUIRED</u></p> <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> MANAGEMENT*</td> <td style="width:50%; border: none;"><input type="checkbox"/> OPAT</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> TECHNICAL*</td> <td style="border: none;"><input type="checkbox"/> REGULATORY*</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> QUALITY ASSURANCE</td> <td style="border: none;"><input type="checkbox"/> MILESTONE CRITERIA</td> </tr> </table> <p>*REGULATORY & MANAGEMENT REVIEWERS INDICATE PREFERENCE FOR A PEER REVIEW: YES <input type="checkbox"/> NO <input type="checkbox"/></p> <p>*TECHNICAL REVIEW YES <input type="checkbox"/> NO <input type="checkbox"/></p>	<input type="checkbox"/> MANAGEMENT*	<input type="checkbox"/> OPAT	<input type="checkbox"/> TECHNICAL*	<input type="checkbox"/> REGULATORY*	<input type="checkbox"/> QUALITY ASSURANCE	<input type="checkbox"/> MILESTONE CRITERIA
<input type="checkbox"/> MANAGEMENT*	<input type="checkbox"/> OPAT						
<input type="checkbox"/> TECHNICAL*	<input type="checkbox"/> REGULATORY*						
<input type="checkbox"/> QUALITY ASSURANCE	<input type="checkbox"/> MILESTONE CRITERIA						

REVIEWERS COMMENTS			RESOLUTION			REVIEWER'S DISPOSITION	
COMMENT NO. & TYPE	PAGE NO.	COMMENTS	ACCEPT	REJECT	REASONING	ACCEPT	REJECT

SECTION 8.5 OF SITE CHARACTERIZATION PLAN (FROM AO)

8.5 MILESTONES, DECISION POINTS, AND SCHEDULES

- o COVERS MILESTONES AND DECISION POINTS THROUGH LICENSE APPLICATION
- o PRESENTS SCHEDULES FOR ACTIVITIES, MILESTONES, AND DECISION POINTS RELATED TO SITE CHARACTERIZATION

SECTION 8.5 OF SITE CHARACTERIZATION PLAN [FROM AO] [CONTINUED]

8.5.1 SITE CHARACTERIZATION ACTIVITIES & MILESTONES

IDENTIFIES ACTIVITIES & MILESTONES FOR

- o EXPLORATORY SHAFT
- o DRILLING & BOREHOLE TESTING
- o HYDROLOGY
- o GEOLOGY & GEOPHYSICS
- o GEOCHEMISTRY
- o TECTONICS
- o GEOENGINEERING
- o METEOROLOGY
- o CLIMATOLOGY

8.5.2 PERFORMANCE ASSESSMENT ACTIVITIES & MILESTONES

IDENTIFIES ACTIVITIES & MILESTONES FOR

- o PRE & POSTCLOSURE PERFORMANCE ASSESSMENT

SECTION 8.5 OF SITE CHARACTERIZATION PLAN (FROM AO) (CONTINUED)

8.5.3 REPOSITORY DESIGN ACTIVITIES & MILESTONES

IDENTIFIES ACTIVITIES & MILESTONES FOR

- o REPOSITORY DESIGN (INCLUDING CDR, TITLE I, TITLE II)

8.5.4 WASTE PACKAGE DESIGN ACTIVITIES & MILESTONES

IDENTIFIES ACTIVITIES & MILESTONES FOR

- o WASTE PACKAGE DESIGN (INCLUDES PREPARATION & PUBLICATION OF DOCUMENTS LEADING TO FINAL DESIGN REPORTS)

SECTION 8.5 OF SITE CHARACTERIZATION PLAN [FROM AO] [CONTINUED]

8.5.5 PROJECT MAJOR DECISION POINTS

- o DEFINES MILESTONES REPRESENTING MAJOR DECISION POINTS
- o PROVIDES LOGIC LEADING TO THE DECISION POINTS [FLOW CHARTS]
- o DESCRIBES ALTERNATIVES AT DECISION POINTS
- o DEFINES PROGRAM ELEMENT INTERFACES [SITE, REPOSITORY, WASTE PACKAGE, PERFORMANCE ASSESSMENT]

8.5.6 SCHEDULES

- o DETAILED SCHEDULES RELATED TO SITE CHARACTERIZATION
- o LESS DETAILED FLOW CHARTS SHOWING MAJOR MILESTONES TO BEGINNING OF REPOSITORY CONSTRUCTION

GENERAL APPROACH TO PREPARATION OF SECTION 8.5
FOR NNWSI PROJECT SCP

- o ALL OF THE DETAILED ACTIVITIES AND MILESTONES PRESENTED IN SECTION 8.3 WILL NOT BE PRESENTED IN SECTION 8.5
- o MINOR ADAPTATIONS IN THE SCP-AO WILL BE NEEDED TO ACCOMMODATE THE ISSUES-BASED STRUCTURE OF SECTION 8.3 (NOTE: AO IS GENERIC AND PREDATES ISSUES-BASED 8.2/8.3)
- o HIGH-LEVEL LOGIC DIAGRAMS PREPARED FOR SECTION 8.3 WILL SERVE AS BASIS FOR SHOWING INTERFACES/LINKAGES FOR SECTION 8.5.5
- o LIST OF MAJOR DECISION POINTS TO BE SHOWN IN 8.5.5 WILL BE DEVELOPED BY CONSENSUS OF PM/TPOs
- o ACTIVITIES & MILESTONES PRESENTED IN SECTIONS 8.5.1 - 8.5.4 WILL BE THOSE ONE LEVEL BELOW THE MASTER SUMMARY NETWORK
- o MASTER SUMMARY NETWORKS WILL BE PRESENTED IN SECTION 8.5.6

PREVIEW OF CONTENTS OF SECTION 8.5

8.5 MILESTONES, DECISION POINTS, AND SCHEDULES

INTRODUCTORY SECTION PROVIDING OVERVIEW OF PROJECT'S
APPROACH AND PLANNING FOR DEMONSTRATION OF COMPLIANCE WITH
REGULATORY REQUIREMENTS THROUGH ISSUE RESOLUTION REPORTS,
POSITION PAPERS ETC.

PREVIEW OF CONTENTS OF SECTION 8.5 (CONTINUED)

- 8.5.1 SITE CHARACTERIZATION ACTIVITIES & MILESTONES
[NOTE: TO BETTER TRACK WITH ISSUES-BASED 8.3, ACTIVITIES
AND MILESTONES WILL BE GROUPED DIFFERENT THAN IN AO]
- 8.5.1.1 REGULATORY/INSTITUTIONAL
- 8.5.1.2 EXPLORATORY SHAFT (SHOW ACTIVITIES & MILESTONES FOR
CONSTRUCTION ONLY -- TESTING SHOWS
UP UNDER SITE PROGRAM AREA)
- 8.5.1.3 GEOLOGY
 - TECTONICS
 - ROCK CHARACTERISTICS
 - EROSION
 - HUMAN INTRUSION
 - SURFACE CHARACTERISTICS
- 8.5.1.4 HYDROLOGY
 - GEOHYDROLOGY
 - PRECLOSURE HYDROLOGY
- 8.5.1.5 GEOCHEMISTRY
 - DISSOLUTION
- 8.5.1.6 CLIMATOLOGY/METEOROLOGY

PREVIEW OF CONTENTS OF SECTION 8.5 [CONTINUED]

8.5.2 - 8.5.4 PERFORMANCE ASSESSMENT, REPOSITORY, AND WASTE PACKAGE

- o LISTS OF ACTIVITIES & MILESTONES FOR PERFORMANCE ASSESSMENT, REPOSITORY DESIGN, WASTE PACKAGE DESIGN AT NEXT LEVEL OF DETAIL BELOW MASTER SUMMARY NETWORKS

PREVIEW OF CONTENTS OF SECTION 8.5 (CONTINUED)

8.5.5 PROJECT MAJOR DECISION POINTS

- o TABLES SHOWING MAJOR DECISION POINTS
- o FLOW CHARTS SHOWING INTERFACES AMONG SITE PROGRAMS, AND PERFORMANCE ASSESSMENT, REPOSITORY, AND WASTE PACKAGE ISSUES

8.5.6 SCHEDULES

- o MASTER SUMMARY NETWORKS [UPDATED TO INCLUDE ISSUES-BASED ACTIVITIES & MILESTONES]

SECTION 8.5.1: SAMPLE LIST OF ACTIVITIES & MILESTONES TO
ESTABLISH APPROPRIATE LEVEL OF DETAIL

8.5.1.2 EXPLORATORY SHAFT ACTIVITIES AND MILESTONES

SITE PREPARATION COMPLETED
CONSTRUCTION OF ES 1
CONSTRUCTION OF ES 2
DETERMINE BREAKOUT LEVEL
MINE BREAKOUTS
LATERAL DRIFT EXTENSION COMPLETED
INSTALLATION OF TEST INSTRUMENTATION
IDS FUNCTIONAL
BEGIN DATA COLLECTION & ANALYSIS
DATA REPORTS ISSUED TO SUPPORT FEIS
FINAL REPORTS ISSUED TO SUPPORT ER
FINAL REPORTS ISSUED TO SUPPORT PSAR
FINAL REPORTS ISSUED TO SUPPORT LA

SECTION 8.5.1 SAMPLE LIST OF ACTIVITIES & MILESTONES TO
ESTABLISH APPROPRIATE LEVEL OF DETAIL

8.5.1.3 GEOLOGY

ACTIVITIES AND MILESTONES FOR STUDY PLANS NOT PROVIDED
WITH SCP
INTEGRATED DRILLING PLAN DEVELOPED AND IMPLEMENTED
FINAL GEOLOGIC MODEL FOR SITE
FINAL GEOLOGIC MAP OF YUCCA MOUNTAIN
DEVELOPMENT OF THREE-DIMENSIONAL ROCK MATERIALS MODEL
FINAL REPORT ON THERMAL & MECHANICAL PROPERTIES OF
POTENTIAL HOST ROCK
POTENTIAL EROSION EFFECTS ON HYDROLOGIC, GEOCHEMICAL,
AND ROCK CHARACTERISTICS
FINAL VOLCANIC HAZARDS REPORT
ASSESSMENT OF FAULTING RATES AND PROBABILITIES
FINAL MAP OF QUATERNARY FAULT LOCATIONS
DESIGN BASIS FOR VIBRATORY GROUND MOTION AND FAULT
DISPLACEMENT FOR LICENSE APPLICATION DESIGN

SECTION 8.5.1 SAMPLE LIST OF ACTIVITIES AND MILESTONES TO
SUGGEST APPROPRIATE LEVEL OF DETAIL

8.3.1.5 GEOCHEMISTRY

FINAL REPORT ON WATER CHEMISTRY
FINAL REPORT ON MINERALOGY ALONG FLOW PATHS
HISTORY OF CHEMICAL ALTERATION AT YUCCA MOUNTAIN
ZEOLITE STABILITY AT YUCCA MOUNTAIN - FINAL REPORT
SUMMARY REPORT ON EFFECTS OF GROUNDWATER COMPOSITION ON
SORPTION
FINAL REPORT ON SORPTION MODEL
FINAL SOLUBILITY REPORT FOR ELEMENTS ON EPA CRITICAL
LIST
FINAL WASTE ELEMENT SPECIATION REPORT
FINAL REPORT ON SPECIATION AND TRANSPORT IN CRUSHED
TUFF COLUMNS
FINAL REPORT - KINETICS OF SORPTION
SUMMARY OF UNSATURATED FLOW COLUMN EXPERIMENTS
FINAL REPORT - RETARDATION BY DIFFUSION
FINAL REPORT - COLLOID PROPERTIES RELATED TO TRANSPORT
AND RETARDATION
SUMMARY REPORT ON FILTRATION BY YUCCA MOUNTAIN TUFF
FINAL REPORT ON INTEGRATED TRANSPORT CALCULATIONS
FINAL REPORT ON COUPLED PHENOMENA

SECTION 8.5.4 WASTE PACKAGE: SAMPLE LIST OF ACTIVITIES AND
MILESTONES TO SUGGEST APPROPRIATE
LEVEL OF DETAIL

EVALUATION OF ALUMINA LINER FOR SPENT FUEL/DECISION

REPORT ON CONTAINER MATERIAL SELECTION

FINAL SENSITIVITY STUDIES FOR WASTE PACKAGE MODELING

SUMMARY OF DESIGN TESTING UNDER THERMAL, RADIATION & MECHANICAL
STRESSES

FINAL DESIGN SELECTION REPORT

FINAL REPORT ON SELECTION OF PRODUCTION TECHNOLOGY FOR
FABRICATION/ASSEMBLY/INSPECTION OF CONTAINERS

RESULTS OF TESTS ON FULL SCALE PROTOTYPE CONTAINER

FINAL SELECTION OF WASTE PACKAGE CLOSURE AND INSPECTION PROCESS

PLAN FOR DEVELOPING SECTION 8.5

FORM TASK FORCE TO REVIEW REVISED SECTIONS OF
8.3 AVAILABLE MAY 1 AND PREPARE LISTS OF
ACTIVITIES AND MILESTONES TO BE ADDED TO MASTER
SUMMARY NETWORKS

BY MAY 13

UPDATE MASTER SUMMARY NETWORKS AND TRANSMIT TO
PM/TPOs FOR REVIEW AND CONCURRENCE

BY MAY 15

TASK FORCE CONTINUES TO DEVELOP INTERMEDIATE
LEVEL ACTIVITIES AND MILESTONES LISTS FOR
INCLUSION IN SECTIONS 8.5.1 - 8.5.4

THROUGH MAY 22

LIST OF MAJOR PROJECT DECISION POINTS FOR 8.5.5
PROVIDED TO TPOs FOR REVIEW AND CONCURRENCE

BY MAY 15

PM/TPOs HOLD WORKSHOP TO REVIEW ACTIVITIES/
MILESTONES LISTS IN 8.5.1 - 8.5.4, AND
DECISION POINTS & LOGIC DIAGRAMS IN 8.5.5

BETWEEN
MAY 18 & 20

SECTION 8.5 FINALIZED AND SENT TO HQ

MAY 25

SUGGESTED TASK FORCE MEMBERS

- 8.5.1.1 REG/INST -- C. BIDDISON, D. MALCOLM, D. DAWSON
- 8.5.1.2 ES -- P. AAMODI
- 8.5.1.3 GEOLOGY -- I. BARBOUR, D. JORGENSEN [WITH HELP AS
NEEDED FOR SUBCOMPONENTS]
- 8.5.1.4 HYDROLOGY -- W. LANGER
- 8.5.1.5 GEOCHEMISTRY -- J. CANEPA
- 8.5.1.6 CLIM/MET -- M. TEUBNER

- 8.5.2 POSTCLO. PA - E. KLAVETTER; PRECLOS. PA - A. STEVENS
- 8.5.3 REPOSITORY -- J. TILLERSON, A. STEVENS
- 8.5.4 WASTE PACKAGE -- L. BALLOU

- 8.5.5 DECISION POINTS & INTERFACES -- J. YOUNKER, U. CLANTON
- 8.5.6 MASTER SUMMARY SCHEDULE -- C. GARVIN

PLUS SAIC PLANNING/SCHEDULING STAFF AS NEEDED TO COVER EACH
ELEMENT OF SCHEDULE

PM/TPO SCP PRESENTATION

- **SCHEDULE**
- **STATUS OF HQ REVIEWS**
- **PLANS FOR FINALIZATION OF SCP**

4/23/87
PM/TPO MEETING

SUCCESS-ORIENTED SCHEDULE FOR SCP (CHAPTERS 1-7)

4/23/87
PM/TPO MEETING
PAGE 2

TITLE	CP	EARLY START/FIN	87								
UNASSIGNED			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	
HO REVIEW CH 1-7	(9 weeks)	14 JAN 87 20 MAR 87	[Bar]								
COMMENT RESOLUTION WORKSHOP CH 1-7	(2 weeks)	23 MAR 87 03 APR 87			[Bar]						
REVISE PER COMMENTS	(1 week)	06 APR 87 13 APR 87				[Bar]					
PRODUCE CAMERA-READY COPY CH 1-7 (CONCURRENCE COPY)	(4 weeks)	13 APR 87 11 MAY 87				[Bar]					
NVO CONCURRENCE REVIEW	(1 week)	11 MAY 87 18 MAY 87					[Bar]				
HO CONCURRENCE REVIEW	(2 weeks)	11 MAY 87 25 MAY 87					[Bar]				
FINAL TEXT CORRECTIONS	(1 week)	25 MAY 87 01 JUN 87						[Bar]			

RUN DATE: 11-MAR-87 13:51 SCPACC3.CH8/1

SUCCESS-ORIENTED SCHEDULE FOR SCP (CHAPTER 8)

TITLE	CP	EARLY START/FIN	87							
UNASSIGNED			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1ST HO REVIEW/COMMENT CYCLE	(9 weeks)	14 JAN 87 06 MAR 87	[Bar]							
REVISE SCP SECTIONS OF CH 8 PER 1ST COMMENT CYCLE	(8 weeks)	06 MAR 87 01 MAY 87			[Bar]					
PRODUCE REVISED DRAFT CH 8	(3 weeks)	01 MAY 87 22 MAY 87					[Bar]			
2ND HO REVIEW	(2 weeks)	25 MAY 87 05 JUN 87						[Bar]		
2ND COMMENT RESOLUTION WORKSHOP	(2 weeks)	08 JUN 87 19 JUN 87						[Bar]		
INTEGRATE COMMENTS & PRODUCE CONCURRENCE COPY	(3 weeks)	19 JUN 87 10 JUL 87							[Bar]	
NVO CONCURRENCE REVIEW	(1 week)	10 JUL 87 17 JUL 87							[Bar]	
HO CONCURRENCE REVIEW	(2 weeks)	10 JUL 87 24 JUL 87							[Bar]	
FINAL TEXT CORRECTIONS	(1 week)	24 JUL 87 31 JUL 87							[Bar]	
PRINT FINAL TEXT (CH 1-8)	(3 weeks)	31 JUL 87 21 AUG 87								[Bar]
DISTRIBUTE TEXT	(3 days)	21 AUG 87 24 AUG 87								[Bar]

Ch. 6
Concurrence Reviews Combined?

COMPLICATIONS IN PLANS FOR SCP REVIEW/FINALIZATION

- OGR POSTPONED COMMENT-RESOLUTION MEETINGS ON SECTIONS 8.3.4, 8.3.5.9, 8.3.5.10

8.3.4 -- SCHEDULED FOR FEBRUARY 23-26 HELD: MARCH 10-13

8.3.5.9, -- SCHEDULED FOR FEBRUARY 23-27 HELD: MARCH 24-26
8.3.5.10

8.3.5.9, -- SECOND WORKSHOP ONGOING: APRIL 21-24
8.3.5.10

- OGR POSTPONED COMMENT-RESOLUTION MEETING ON CHAPTER 6

CHAPTER 6 -- SCHEDULED FOR MARCH 31-APRIL 1 TO BE HELD: MAY 12-13

- SOME REFERENCE VERIFICATION IS NOT READY FOR INCORPORATION INTO DATA AND DESIGN CHAPTERS

STATUS OF CHAPTER 8 SECTIONS

- SECT. 8.2 - UNDER PREPARATION [TO BE COMPLETED IN EARLY MAY BY SUMMARIZING FROM 8.3 IRSs AND SITE PROGRAM OVERVIEWS]
- SECT. 8.3 - OGR COMMENT RESOLUTION ON ALL SECTIONS COMPLETED EXCEPT AS PREVIOUSLY NOTED
- REVISIONS UNDERWAY (DETAILS LATER)
- SECT. 8.4 - OGR COMMENT RESOLUTION MEETING HELD MARCH 9-10
- REVISIONS UNDERWAY
- SECT. 8.5 - UNDER PREPARATION [MORE TO COME]
- SECT. 8.6 - OGR COMMENT RESOLUTION MEETING SCHEDULED FOR APRIL 24, 1987
- SECT. 8.7 - OGR COMMENT RESOLUTION MEETING HELD MARCH 9-10
- REVISIONS UNDERWAY

HQ COMMENT RESOLUTION WORKSHOPS FOR DATA AND DESIGN CHAPTERS
MARCH 24, 1987 - APRIL 3, 1987

● CHAPTER 1	267 COMMENTS
● CHAPTER 2	36 COMMENTS
● CHAPTER 3	117 COMMENTS
● CHAPTER 4	54 COMMENTS
● CHAPTER 5	86 COMMENTS
● CHAPTER 6	SCHEDULED 5/12-13/87
● CHAPTER 7	228 COMMENTS

PROCEDURES FOR FINALIZATION OF DATA AND DESIGN CHAPTERS

- REFERENCE VERIFICATION AND EDITORIAL CHANGES WILL BE COMPILED ON THE TECHNICAL MARKUPS FOR EACH CHAPTER [THROUGH MAY 25]
- TECHNICAL MARKUP TO RECEIVE FINAL CHECK BY SAIC AND PROJECT LEADS [BEFORE MAY 25]
- CHAPTERS WILL BE WORD PROCESSED AND PRODUCED CAMERA-READY [MAY 25 - JUNE 19]
- FINAL QUALITY PROOF BY SAIC AND PROJECT LEADS [JUNE 15 - JUNE 26]

REFERENCE VERIFICATION
STATUS OF CHAPTERS 1 THROUGH 7

- CHAPTER 1: 1.0, 1.1, 1.3, 1.8 IN GOOD SHAPE
1.2, 1.4, 1.5, 1.6, 1.7 WILL REQUIRE AUTHOR
INPUT TO COMPLETE
- CHAPTER 2: COMPLETE
- CHAPTER 3: APPROXIMATELY 75 VERIFICATION PROBLEMS WILL REQUIRE
AUTHOR INPUT
- CHAPTER 4: 25 PROBLEMS REMAINING. JULIE CANEPA TO PROVIDE
RESOLUTIONS
- CHAPTER 5: APPROXIMATELY 20 NEW REFERENCES ADDED. MAY REQUIRE
AUTHOR INPUT
- CHAPTER 6: APPROXIMATELY 25 VERIFICATION PROBLEMS WILL REQUIRE
AUTHOR INPUT
- CHAPTER 7: APPROXIMATELY 75 VERIFICATION PROBLEMS WILL REQUIRE
AUTHOR INPUT

SOLUTION: WORKSHOPS

VERIFICATION WORKSHOPS

WHO: ALL INVOLVED AUTHORS AND SAIC VERIFICATION COORDINATORS

WHEN: MAY 3 THROUGH MAY 15: APPROXIMATELY 1 DAY/CHAPTER

WHERE: AT LABS/USGS (PERHAPS LIVERMORE AND USGS ONLY)

SAIC WILL CONTACT ORGANIZATION CONTACT LEADS TO ARRANGE
CONVENIENT DATES

USGS - BILL LANGER, BILL WILSON
 DAVE SCHLEICHER (CH. 1 AND 3)

LLNL - DALE WILDER

LANL - JULIE CANEPA

SNL - AL STEVENS

STATUS OF SECTION 8.3

- SECTION 8.3 WILL GO TO OGR FOR REVIEW MAY 25, 1987 WITH APPROXIMATELY 700 NEW PAGES OF FIRST DRAFT OR HEAVILY REVISED TEXT
- SECTION 8.3 WILL CONTAIN ABOUT 300 PAGES OF NEW TABLES AND FIGURES
- CONCLUSION: NOT ALL OF SECTION 8.3 SHOULD BE REGARDED AS A FINAL DRAFT

SCP SCHEDULE - OVERVIEW OF ACTIVITIES

		<u># WEEKS</u>
● PARALLEL OGR AND PROJECT REVIEWS OF SECTION 8.3	MAY 25-JUNE 5	2 WKS
● OGR COMMENT RESOLUTION WORKSHOP ON SECTION 8.3	JUNE 8-JUNE 19	2 WKS
● PROJECT RETURNS FROM WORKSHOP AND REVISES 8.3 TEXT ACCORDING TO WORKSHOP AGREEMENTS	JUNE 22-JULY 3	2 WKS
● PROJECT PRODUCES CAMERA READY TEXT OF SECTION 8.3	JULY 3-31	4 WKS
● CHAPTERS 1-8 START THROUGH FINAL CONCURRENCE AT NVO AND HQ BY MID-JULY (MAY START 1-7 EARLIER)	MID-JULY	
● FINAL CONCURRENCE REVISIONS RECEIVED AND COMPLETED FOR ALL CHAPTERS	JULY 31, 1987	
● TOTAL DOCUMENT GOES TO GPO	AUGUST 3, 1987	

SUGGESTED REVIEW PROCEDURE FOR PROJECT
INTEGRATION REVIEW OF SECTIONS 8.2, 8.3, 8.5
MAY 25 - JUNE 5

● 6 PARALLEL REVIEW TEAMS FORMED TO COVER

[1] INTEGRATION OF POSTCLOSURE PERFORMANCE ISSUES WITH
SITE PROGRAMS

[2] INTEGRATION OF REPOSITORY AND WASTE PACKAGE DESIGN ISSUES
WITH SITE PROGRAMS

[3] INTEGRATION OF POSTCLOSURE PERFORMANCE ASSESSMENT PROGRAMS

[4] INTEGRATION OF RADIOLOGICAL SAFETY ISSUES WITH SITE
PROGRAMS

[5] MISCELLANEOUS

[6] 8.2, 8.5

● SUGGESTED LIST OF REVIEWERS FOLLOWS

4/21/87

TEAMS FOR PROJECT INTEGRATION REVIEW OF SECTIONS 8.2 & 8.3: May 25 - June 5, 1987, SAIC Offices
Las Vegas, NV

SUGGESTED MEMBERS

**TEAM 1: Integration of Postclos. Performance Assessment
with Site Programs**

Total system (8.3.5.13)
GWTT (8.3.5.12)
NRC Siting Criteria (8.3.5.17)
Geohydrology (8.3.1.2)
Geochemistry (8.3.1.3)
Rock characteristics (8.3.1.4)
Climate (8.3.1.5)
Erosion (8.3.1.6)
Tectonics (8.3.1.8)
Human interference (8.3.1.9)

F. Bingham, SNL -- Co-Chairman
S. Sinnock, SNL
M. Blanchard, WMPO/D. Jorgenson, SAIC
U. Clanton, WMPO
M. Pendleton, SAIC -- Co-Chairman
R. Raup/ W. Langer/ D. Schleicher, USGS
G. DePoorter, LANL
T. Barbour, SAIC/USGS

**TEAM 2: Integration of Repository and Waste Package Design
with Site Programs**

Underground repository config. (8.3.2.2)
Technical feasibility (8.3.2.5)
Retrievability (8.3.5.2)
Waste package characteristics (8.3.4.2)
Rock characteristics (8.3.1.4, 8.3.1.15)
Surface characteristics (8.3.1.14)
Hydrology (8.3.1.2, 8.3.1.16)
Tectonics (preclosure) (8.3.1.17)
Seals (8.3.3.2)
Seals perform. (8.3.5.11)

M. Voegele, SAIC -- Co-Chairman
J. Tillerson, SNL -- Co-Chairman
J. Frazier, SAIC
L. Skousen, WMPO
L. Ballou, LLNL

TEAM 3: Integration of Performance Assessment Program

Strategy for postclosure perf. assess. (8.3.5.8)
Indiv. prot. requirem. (8.3.5.14)
Gr-Water Prot. (8.3.5.15)
Total system (8.3.5.13)
Containment (8.3.5.9)
EBS release (8.3.5.10)
GWTT (8.3.5.12)
8.3.5.19, 8.3.5.20 - Analytical techniques

M. Teubner, SAIC -- Co-Chairman
E. Klavetter, SNL -- Co-Chairman
K. Eggert, LLNL
G. Shideler, USGS
J. Kerrisk, LANL
D. Snow, SAIC/USGS
D. Livingston, WMPO

TEAMS FOR PROJECT INTEGRATION REVIEW OF SECTIONS 8.2 & 8.3: May 25 - June 5, 1987, SAIC Offices
(continued) Las Vegas, NV

TEAM 4: Integration of Radiological Safety with Site Programs

Repos. radiol. design crit. (8.3.2.3)
Strat. for preclos. perf. assess. (8.3.5.1)
Public exposure-normal (8.3.5.3)
Worker exposure-normal (8.3.5.4)
Accidental exposures (8.3.5.5)
Non-radiol. H & S (8.3.2.4)
Population density (8.3.1.10)
Site ownership (8.3.1.11)
Meteorology (8.3.1.12)
Offsite install. (8.3.1.13)
Preclosure tectonics (8.3.1.17)
Waste package containm.-preclos. (8.3.4.3)
Waste package prod. tech. (8.3.4.4)

TEAM 5: Miscellaneous

Site program overview (8.3.1.1)
Repository program overview (8.3.2.1)
Seals program overview (8.3.3.1)
Waste package overview (8.3.4.1)
8.3.5.6, 8.3.5.7, 8.3.5.18 -- HLF sections

TEAM 6: Section 8.2
Section 8.5

SUGGESTED MEMBERS

A. Stevens, SNL -- Co-Chairman
M. Glora, SAIC--Co-Chairman
M. Foley, SAIC
B. Jankus, WMPO
L. Skousen, WMPO

M. Brown, SAIC -- Co-Chairman
W. Dudley, USGS
R. Levich, WMPO

D. Vieth, WMPO
T. Hunter, SNL -- Co-Chairman
L. Hayes, USGS
D. Oakley, LANL
M. Spaeth, SAIC -- Co-Chairman
L. Ramspott, LLNL
J. Younker, SAIC

FINAL SECTION 8.3 REVISION CYCLE JUNE 8 - JUNE 17
STAFF REQUIREMENTS

- PROJECT AND SAIC SECTION LEADS ATTEND HQ WORKSHOP JUNE 8 - JUNE 19, 1987
- SAIC SECTION LEADS AND PROJECT LEADS COMPLETE TECHNICAL REVISIONS PER AGREEMENTS AT HQ WORKSHOP BY JULY 3, 1987
- EDITORIAL AND REFERENCE VERIFICATION CHANGES TO BE COMPILED BY SAIC IN PARALLEL WITH TECHNICAL REVISIONS [JUNE 8 - JULY 3]
- CAMERA-READY PRODUCTION - BEGINS JULY 3
 - SAIC AND PROJECT SECTION LEADS REMAIN ON-CALL FOR PROBLEM SOLVING THROUGH JULY 31
- FINAL QUALITY CHECK AND "TECHNICAL PROOF" BY SAIC SECTION LEADS AND PROJECT LEADS [JULY 3-17]

PROJECT STAFF COMMITMENTS

<u>CHAPTER #</u>	<u>SAIC LEAD</u>	<u>PROJECT LEAD</u>
1	MARTHA PENDLETON	DAVE SCHLEICHER, USGS
2	ERNIE HARDIN	FRAN NIMICK, SNL
3	MIKE TEUBNER	BILL LANGER, USGS
4	ELIZABETH HUGHES	JULIE CANEPA, LOS ALAMOS
5	SARA SALTZER	DAVE MOORE, USGS
6	MIKE VOEGELE	AL DENNIS, SNL
7	U-SUN PARK	DALE WILDER, LLNL
8.2	MIKE VOEGELE/ JEAN YOUNKER	F. BINGHAM, A. STEVENS, SNL; D. WILDER, K. EGGERT, LLNL; M. GIAMPAOLI, J. DANNA, SAIC; T. BARBOUR, SAIC/USGS + ISSUE COORDINATORS
8.4	MARY LOU BROWN	PAUL AAMODT, LOS ALAMOS
8.5	CANDACE BIDDISON	--
8.6	STEVE METTA	JIM BLAYLOCK, WMPO
8.7	MARY LOU BROWN	BETTY JANKUS, WMPO

PROJECT STAFF COMMITMENTS (CONTINUED)

<u>SECTION</u>		<u>SAIC</u>	<u>PROJECT</u>
8.3.1.1	OVERVIEW	JORGENSON	BLANCHARD
8.3.1.2	GEOHYDROLOGY	TEUBNER	LANGER / BARBOUR
8.3.1.3	GEOCHEMISTRY	HUGHES	CANEPA
8.3.1.4	ROCK CHARACTERISTICS	EPPLER	BARBOUR
8.3.1.5	CLIMATE	SALTZER	MOORE
8.3.1.6	DISSOLUTION	HUGHES	CANEPA
8.3.1.7	EROSION	GIAMPAOLI	SCHLEICHER
8.3.1.8	TECTONICS (POST)	GRANT	FOX
8.3.1.9	HUMAN INTERFERENCE	GIAMPAOLI	SCHLEICHER
8.3.1.10	POPULATION DENSITY	FASANO	JANKUS
8.3.1.11	LAND OWNERSHIP	FASANO	GASSMAN
8.3.1.12	METEOROLOGICAL CONDITIONS	JABLONSKI	LANGER
8.3.1.13	OFFSITE INST.	FASANO	JANKUS
8.3.1.14	SURFACE CHARACTERISTICS	SUBLETTE	STEVENS
8.3.1.15	ROCK CHARACTERISTICS (PRE)	HARDIN	NIMICK
8.3.1.16	HYDROLOGY	GIAMPAOLI	LANGER
8.3.1.17	TECTONICS (PRE)	KING	FOX
8.3.2	REPOSITORY	VOEGELE	STEVENS
8.3.3	SEALS	VOEGELE	STEVENS
8.3.4	WASTE PACKAGE	PARK	WILDER

PROJECT STAFF COMMITMENTS (CONTINUED)

<u>SECTION</u>	<u>SAIC</u>	<u>PROJECT</u>
8.3.5.1- RETRIEVABILITY & 8.3.5.5 RAD. SAFETY	VOEGELE	STEVENS
8.3.5.6, HLF 8.3.5.7	DANNA	STEVENS
8.3.5.8 STRAT. PERF. ASSESSMENT	TEUBNER	KLAVETTER
8.3.5.9 CONTAINMENT	PARK	EGGERT
8.3.5.10 EBS	PARK	EGGERT
8.3.5.11 SEALS	VOEGELE	STEVENS
8.3.5.12 GWTT	TEUBNER	SINNOCK
8.3.5.13 TOTAL REL.	TEUBNER	TIERNEY
8.3.5.14, INDIV. PROT.	GIAMPAOLI	TIERNEY
8.3.5.15 GR-WATER PROT.		
8.3.5.16 PERF. CONF.	VOEGELE	STEVENS
8.3.5.17 NRC SITE CRITERIA	DANNA	BLANCHARD
8.3.5.18 HLF-POST	DANNA	BLANCHARD
8.3.5.19, ANAL. TECHN. 8.3.5.20	TEUBNER	KLAVETTER

STATUS OF SCP REVISIONS FOR SECTION 8.3

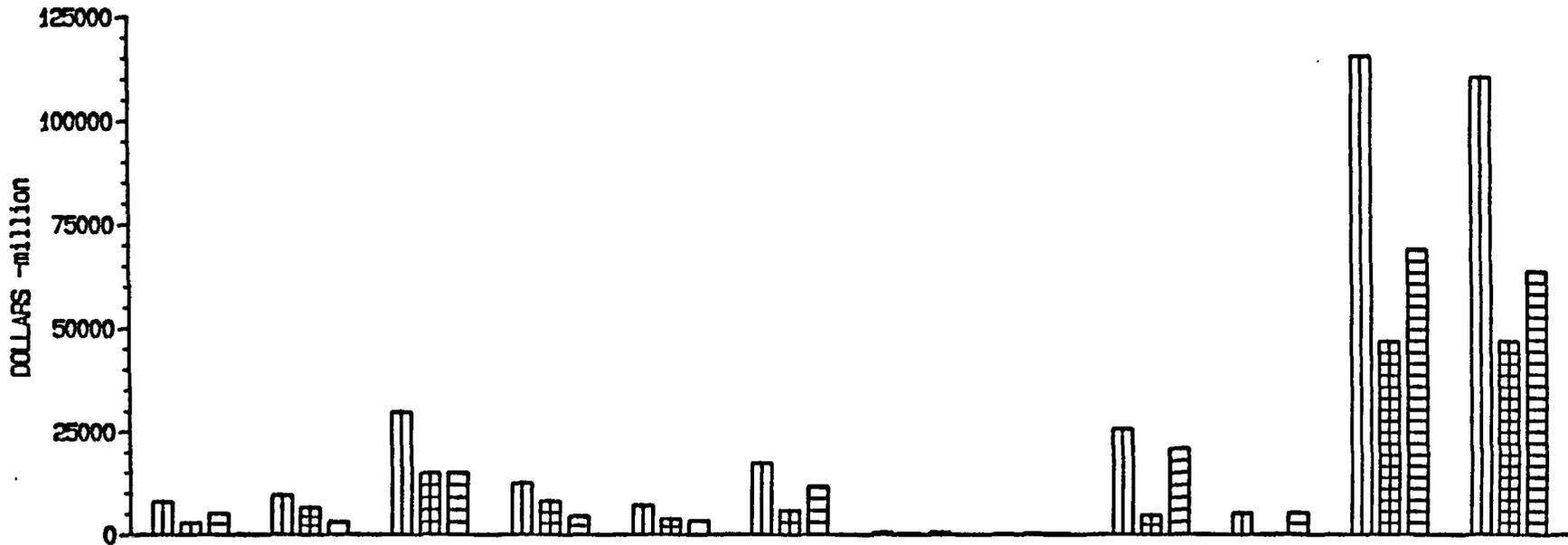
ALL SECTIONS ARE ON SCHEDULE FOR MAY 1 TEXT FREEZE EXCEPT

- TECTONICS -- ADDITIONAL TIME [ABOUT 2 WEEKS] NEEDED TO REACH LEVEL OF DETAIL REQUIRED BY NRC/DOE AGREEMENT

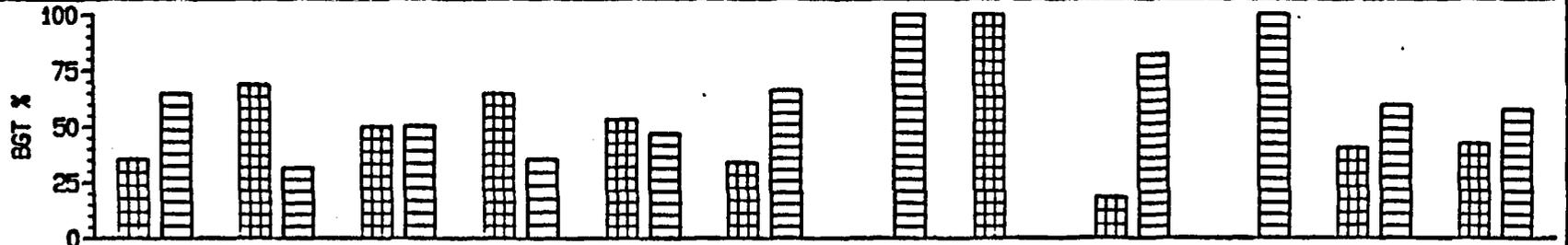
PROGRESS ON PERFORMANCE ALLOCATION

- NEW PARAMETERS TABLES SHOWING LINKAGES FROM PERFORMANCE AND DESIGN ISSUES TO CHARACTERIZATION PROGRAMS WILL BE IMMATURE IN MAY SCP DRAFT
- PROJECT STAFF RESISTANCE TO SETTING NUMERICAL GOALS FOR LOW-LEVEL PARAMETERS IS INCREASING
- MULTI-USE PARAMETERS, PARAMETERS USED IN CREDIBILITY ARGUMENTS, AND PARAMETERS FOR WHICH NO SENSITIVITY STUDIES ARE AVAILABLE CAUSE MAJOR PROBLEMS
- DEFICIENCY IN NUMERICAL GOALS IS LIKELY TO BE A MAJOR HQ COMMENT ON MAY DRAFT OF SECTION 8.3

NNWSI PROJECT - Earned Value Implementation Status, April 1987 (\$000 & Percent)

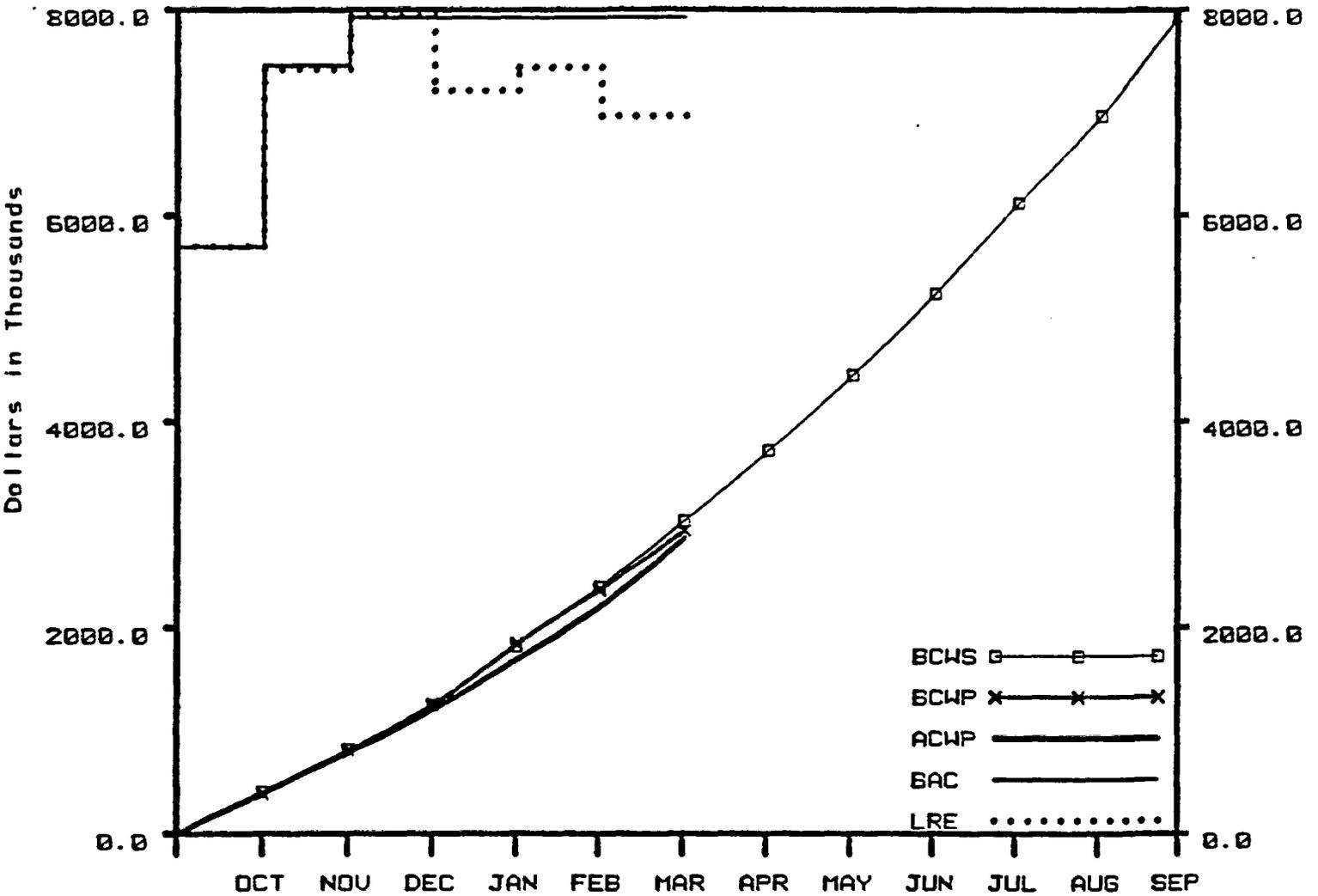


BUDGET	7923	9535	29835	12472	7086	17370	489	150	25551	5162	115573	110411
MEAS	2802	6541	14889	8070	3771	5866	0	150	4644	0	46733	46733
LOE	5121	2994	14946	4402	3315	11504	489	0	20907	5162	68840	63678
WBS ELEMENT	SY (2.1)	WP (2.2)	SI (2.3)	FP (2.4)	RI (2.5)	ES (2.6)	TF (2.7)	LA (2.8)	PM (2.9)	SG (2.10)	TOTAL	TOTAL-SG



MEAS (%)	35.4	68.6	49.9	64.7	53.2	33.8	0.0	100.0	18.2	0.0	40.4	42.3
LOE (%)	64.6	31.4	50.1	35.3	46.8	66.2	100.0	0.0	81.8	100.0	59.6	57.7
WBS ELEMENT	SY (2.1)	WP (2.2)	SI (2.3)	FP (2.4)	RI (2.5)	ES (2.6)	TF (2.7)	LA (2.8)	PM (2.9)	SG (2.10)	TOTAL	TOTAL-SG

NNWSI PROJECT COST PERFORMANCE GRAPH FOR MAR 1987 WBS: 1.2.1



SYSTEMS

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	641.9	3032.7
B. BUDGETED COST OF WORK PERFORMED (BCWP)	575.5	2937.8
C. ACTUAL COST OF WORK PERFORMED (ACWP)	667.8	2863.2
D. BUDGET AT COMPLETION (BAC)		7923.0
E. LATEST REVISED ESTIMATE (LRE)		6966.4

VARIANCES (Year To Date)

	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-94.9	-3.13
G. COST VARIANCE (B-C)	74.6	2.54
H. AT COMPLETION VARIANCE (D-E)	956.6	12.07

Remarks:

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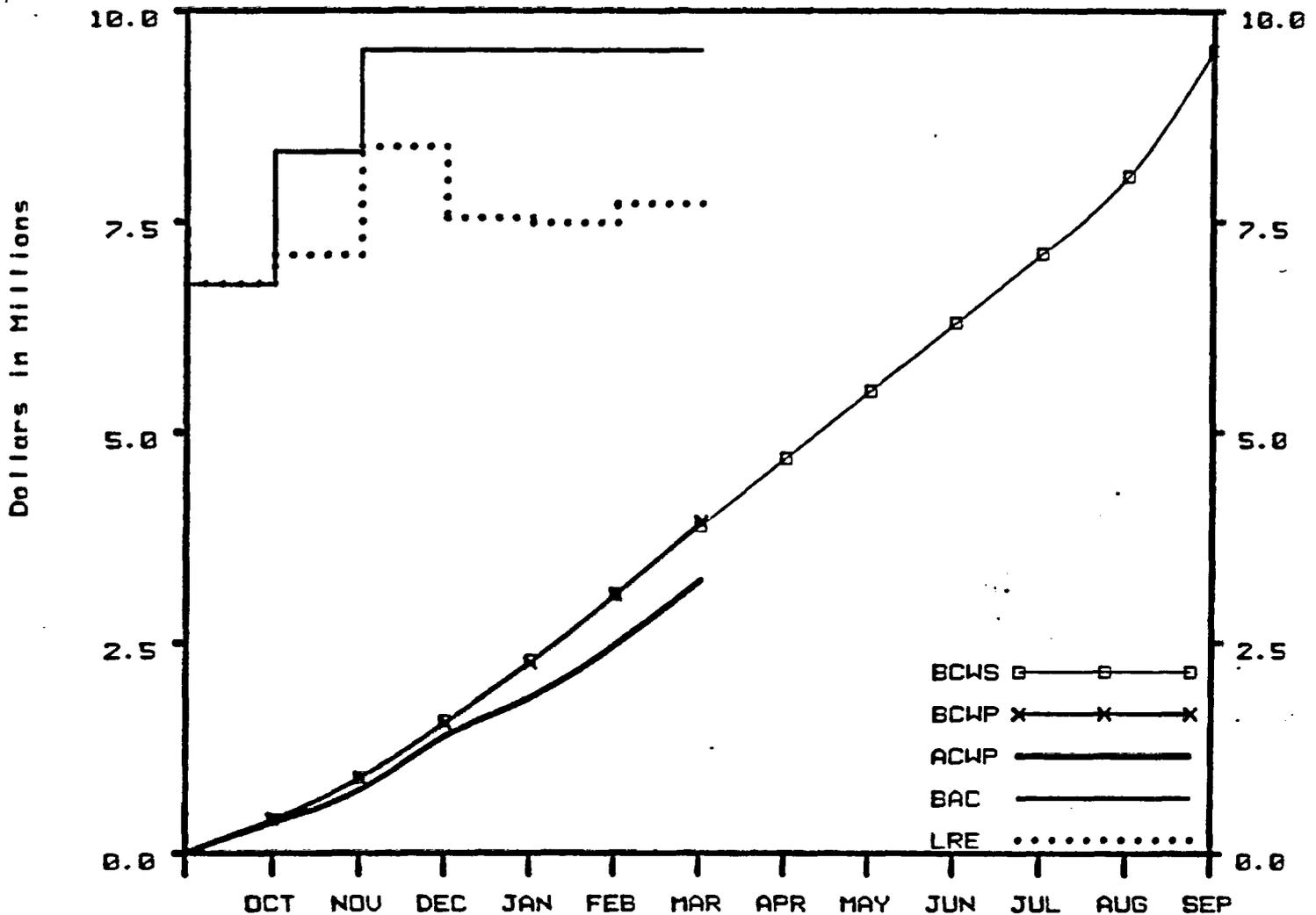
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1.2.1 SYSTEMS
BUDGET ANALYSIS AND PROJECTIONS

<u>COMMENTS</u>	<u>AMOUNT (K)</u>
<u>VARIANCES</u>	
PLAN	\$ 170 <10%
COST	\$ 75 <10%
SCHEDULE	\$ -95 <10%
BUDGET AT COMPLETION	\$ 7,923
LATEST REVISED ESTIMATE	\$ 7,023
VARIANCE AT COMPLETION	\$ 900
<u>VARIANCE COMPOSITE AT COMPLETION</u>	
REDIRECTION OF RESOURCES TO SCP	\$ 200K
IMPLEMENTATION OF SEMP AND CMP	\$ 700K

- MAJOR ACTIVITIES IN THIS ELEMENT ARE IN WORK. COST UNDER-RUNS ARE PRIMARILY THE RESULT OF THE LATE IMPLEMENTATION OF SEIG ACTIVITIES AND DELAYS IN MEETING STAFFING PLANS AND HIRING CYCLE IN CONFIGURATION MANAGEMENT.
- ACTIVITIES ASSOCIATED WITH THE CMP AND SEIG WILL NOT OCCUR AT THE LEVELS ORIGINALLY PLANNED IN FY 1987.
- THE COST UNDERRUN IS THIS ELEMENT WILL NOT ADVERSELY AFFECT THE PROJECT.
- THE ONLY WAY TO RECOUP THE UNDERRUN IS TO ADD ADDITIONAL RESOURCES THROUGH SUBCONTRACTS OR ACCELERATED HIRING. HOWEVER, THIS IS NOT IN THE PLAN.

NNWSI PROJECT COST PERFORMANCE GRAPH FOR MAR 1987 WBS: 1.2.2



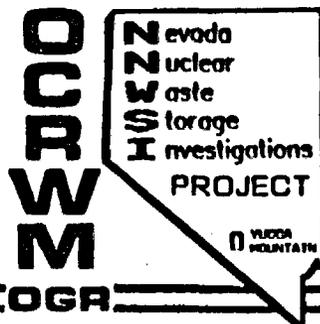
WASTE PACKAGE

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	0.8	3.9
B. BUDGETED COST OF WORK PERFORMED (BCWP)	0.9	3.9
C. ACTUAL COST OF WORK PERFORMED (ACWP)	0.8	3.2
D. BUDGET AT COMPLETION (BAC)		9.5
E. LATEST REVISED ESTIMATE (LRE)		7.7

UARIANCES (Year To Date)

	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	1.07
G. COST VARIANCE (B-C)	0.7	17.46
H. AT COMPLETION VARIANCE (D-E)	1.8	19.19

Remarks:



1.2.2 WASTE PACKAGE BUDGET ANALYSIS AND PROJECTIONS

COMMENTSAMOUNT (K)VARIANCES

PLAN	\$	643	17%
COST	\$	684	17%
SCHEDULE	\$	42	<10%
BUDGET AT COMPLETION	\$	9,535K	
LATEST REVISED ESTIMATE	\$	9,035K	
VARIANCE AT COMPLETION	\$	500K	

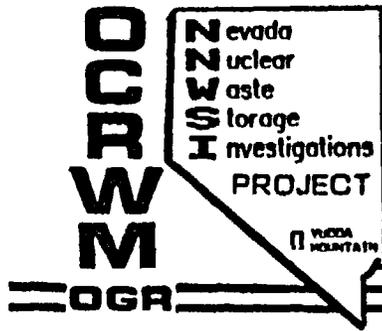
VARIANCE COMPOSITE

REDIRECTION OF RESOURCES TO SCP	\$	150K	
BILLINGS LAGS	\$	350K	

UNDERRUN

ANALYSIS AT THE END OF MARCH WASTE PACKAGE METAL BARRIERS	\$	104K	
COST VARIANCE			
SCHEDULE VARIANCE			3%

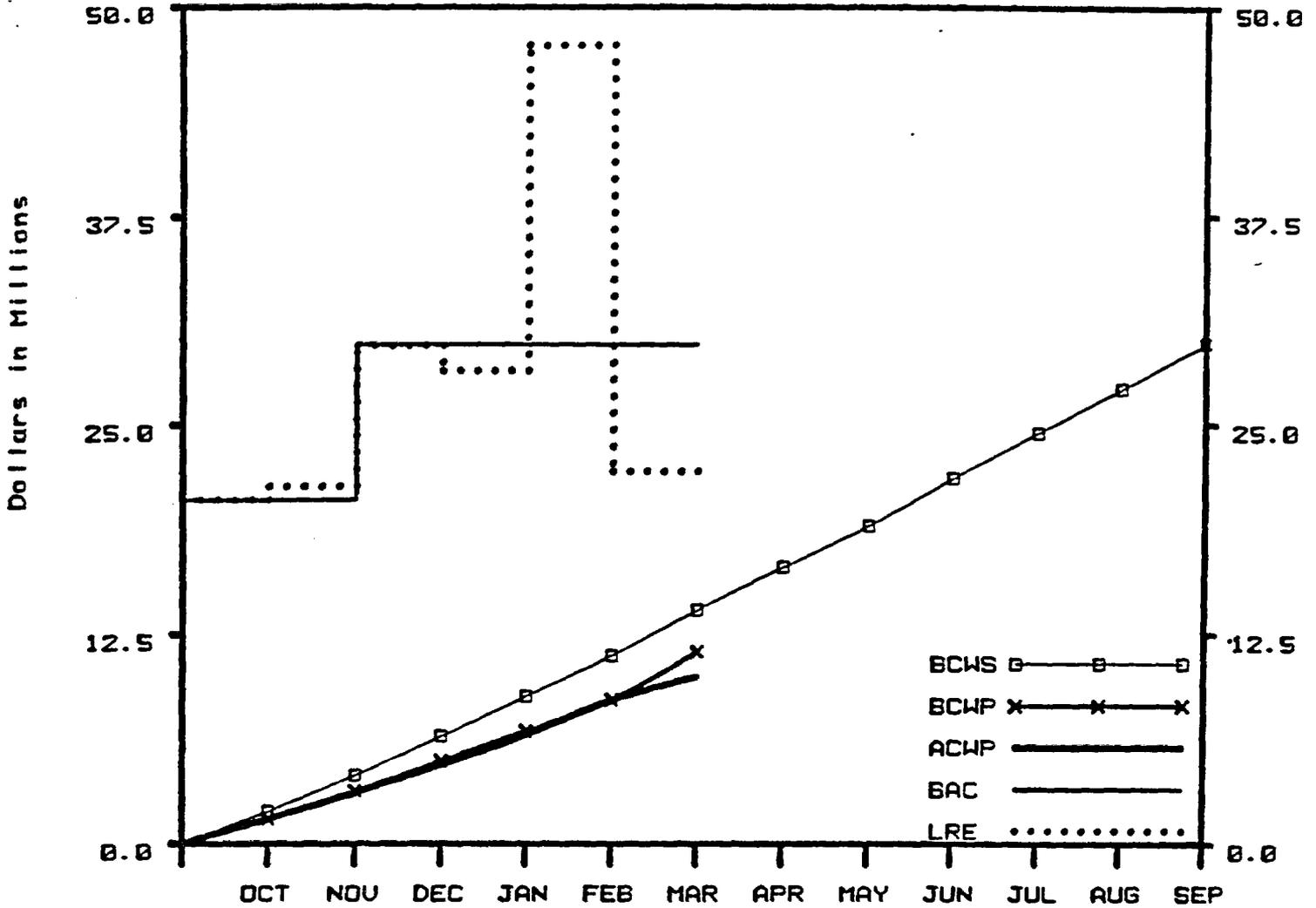
- THE SIP FOR THIS ACTIVITY HAS NOT BEEN COMPLETED WHICH RESULTS IN A DELAY IN PLACING SUBCONTRACTORS. ADDITIONALLY SOME OF THE SUBCONTRACTS WHICH ARE IN PROGRESS HAVE A BILLING LAG. THE SIP IS BEING DELAYED DUE TO THE CONTINUED EFFORT ON THE SCP. THE DRAFT IS APPROXIMATELY 80% COMPLETED AND WILL BE AVAILABLE BY MAY 1. MILESTONE M236 SCHEDULED FOR DELIVERY WILL BE DELAYED UNTIL MAY 30 DUE TO WORK ON THE SCP REVISIONS. THIS TASK IS EXPECTED TO OVERRUN BY \$25K AT THE END OF THE FISCAL YEAR.



1.2.2 WASTE PACKAGE
BUDGET ANALYSIS AND PROJECTIONS (CONTINUED)

- ACTIVITIES ASSOCIATED WITH THE START OF THE ACD ORIGINALLY SCHEDULED FOR THE FIRST HALF OF THE FISCAL YEAR HAVE BEEN DELAYED. MILESTONE M233 MAY BE DELAYED DUE TO THE ANTICIPATED SLIP IN THE START OF THE ACD. THEREFORE ALL COSTS ASSOCIATED WITH THIS DELAY SHOULD BE REQUESTED AS CARRYOVER IN FY 1988.
- ALL COST UNDERRUNS RESULTING FROM BILLING LAGS WILL BE REQUESTED AS CARRYOVER.

NNWSI PROJECT COST PERFORMANCE GRAPH FOR MAR 1987 WBS: 1.2.3



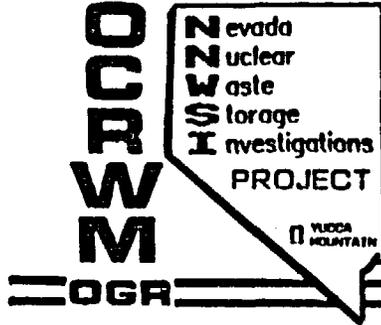
SITE INVESTIGATIONS

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	2.7	13.9
B. BUDGETED COST OF WORK PERFORMED (BCWP)	2.8	11.4
C. ACTUAL COST OF WORK PERFORMED (ACWP)	1.4	9.9
D. BUDGET AT COMPLETION (BAC)		29.8
E. LATEST REVISED ESTIMATE (LRE)		22.2

VARIANCES (Year To Date)

	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-2.5	-18.04
G. COST VARIANCE (B-C)	1.5	12.92
H. AT COMPLETION VARIANCE (D-E)	7.6	25.56

Remarks:



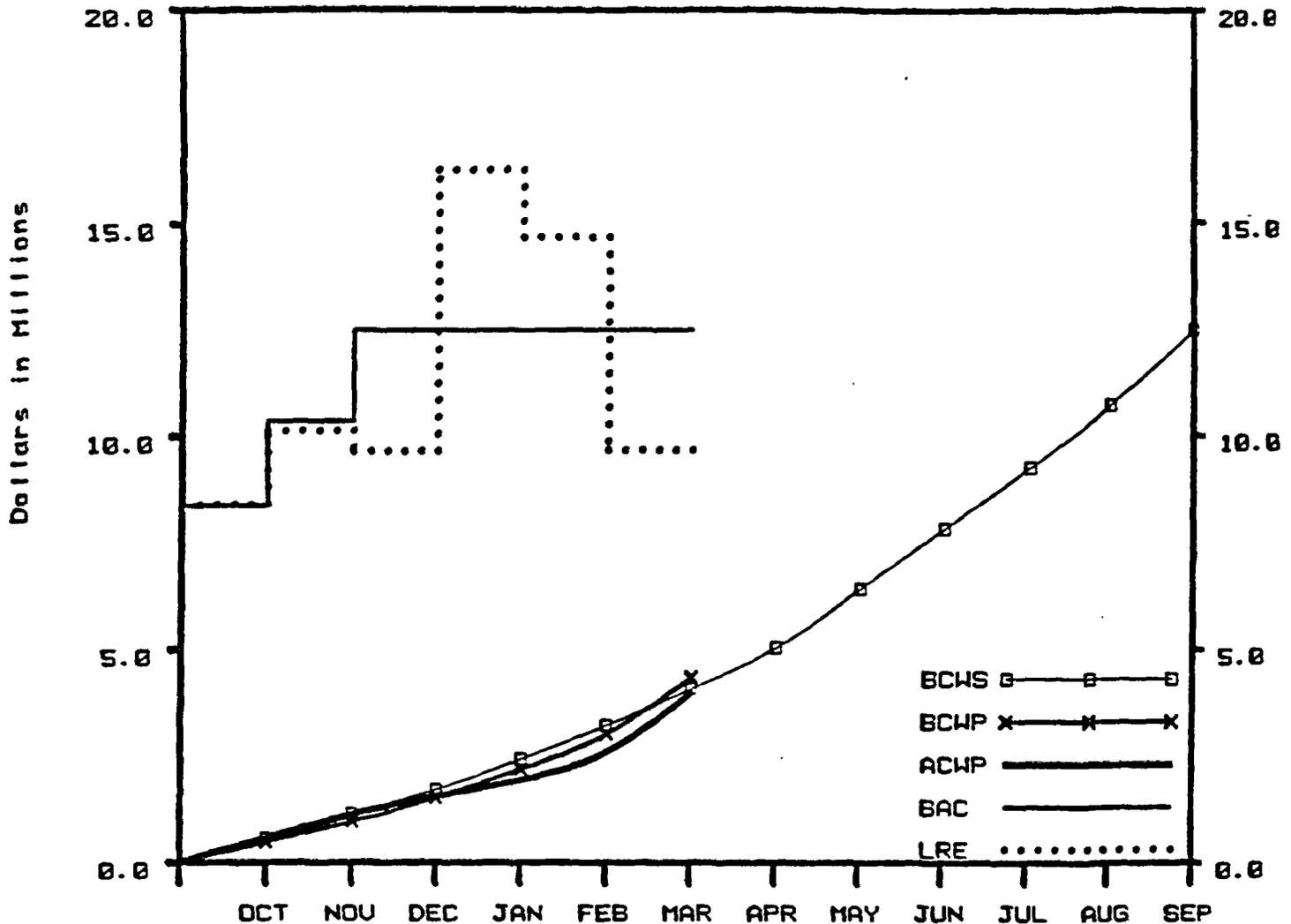
1.2.3 SITE INVESTIGATIONS
BUDGET ANALYSIS AND PROJECTIONS

<u>COMMENTS</u>	<u>AMOUNT (K)</u>	
<u>VARIANCES</u>		
PLAN	\$ 4,000	27%
COST	\$ 1,500	13%
SCHEDULE	\$-2,500	18%
BUDGET AT COMPLETION	\$ 29,835	
LATEST REVISED ESTIMATE	\$ 19,000	
VARIANCE AT COMPLETION	\$ 10,836	

VARIANCE COMPOSITE AT COMPLETION

- THE STOP-WORK ORDER HAS DELAYED THE START OF DRILLING AND OTHER TECHNICAL SITE ACTIVITIES. THE FOLLOWING PROJECTED UNDERRUNS SHOULD BE REQUESTED AS CARRYOVER FOR ACTIVITIES NOT COMPLETED IN FY 1987; (A) DRILLING AND RELATED FIELD ACTIVITIES \$4,800 (B) TECTONICS AND VOLCANISM, GEOLOGY, HYDROLOGY \$6,000K.

NNWSI PROJECT COST PERFORMANCE GRAPH FOR MAR 1987 WBS: 1.2.4



REPOSITORY INVESTIGATIONS

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	0.9	4.1
B. BUDGETED COST OF WORK PERFORMED (BCWP)	1.3	4.3
C. ACTUAL COST OF WORK PERFORMED (ACWP)	1.4	4.0
D. BUDGET AT COMPLETION (BAC)		12.5
E. LATEST REVISED ESTIMATE (LRE)		9.6

VARIANCES (Year To Date)

	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.3	6.54
G. COST VARIANCE (B-C)	0.4	8.49
H. AT COMPLETION VARIANCE (D-E)	2.8	22.67

Remarks:

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1.2.4 REPOSITORY
BUDGET ANALYSIS AND PROJECTIONS

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COMMENTS

AMOUNT (K)

ERRORS IN COST PERFORMANCE DATA

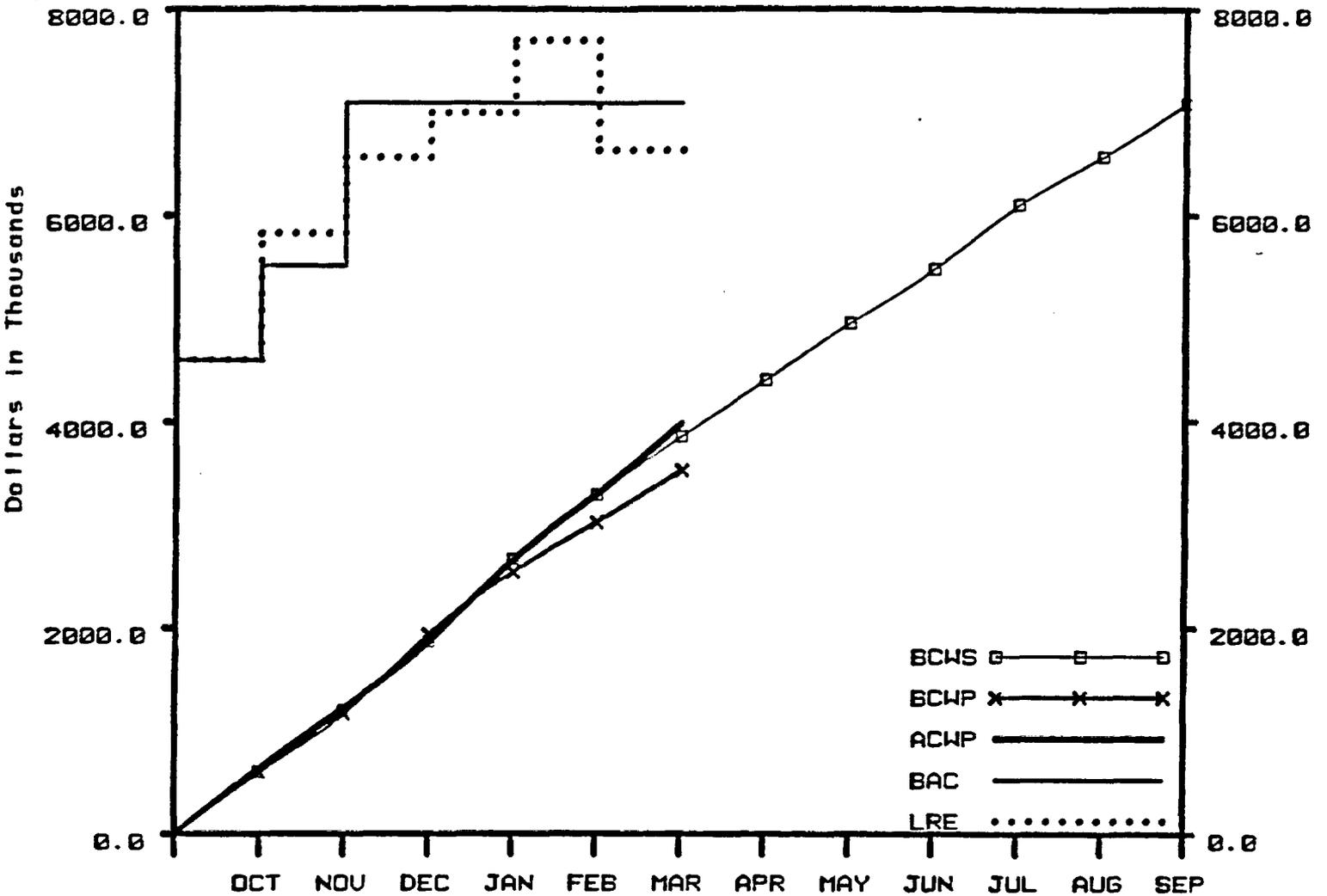
VARIANCES

PLAN	\$ 101K
COST	\$ 400K
SCHEDULE	\$ 300K
BUDGET AT COMPLETION	\$ 12,472K
LATEST REVISED ESTIMATE	\$ 11,472K
VARIANCE AT COMPLETION	\$ 2,000K

VARIANCE COMPOSITE

- BASED ON YEAR TO DATE ANALYSIS THE COST UNDERRUN IS MINIMAL. HOWEVER ON A MONTH TO MONTH BASIS THE PLAN INCREASES BY 40% IN MAY TO 90% IN SEPTEMBER WHEN COMPARED TO THE PLAN FOR THE MONTH OF MARCH. UNLESS THE LEVEL OF EFFORT INCREASES THERE WILL BE AN UNDERRUN OF APPROXIMATELY \$2,000K.
- THE UNDERRUNS ARE ASSOCIATED WITH THE DELAYED PROCUREMENT OF THE DPBM AND RELATED ENGINEERING EQUIPMENT ACTIVITIES CONTAINED IN THE REPOSITORY DEVELOPMENT AND TESTING ACTIVITIES.
- ALL ACTIVITIES AND MILESTONES ASSOCIATED WITH THESE COST UNDERRUNS WILL BE REQUESTED FOR EXPENDITURE IN FY 1988. IN ORDER TO MAKE THIS ASSESSMENT THE PI'S INVOLVED MUST USE EXISTING COST AND PERFORMANCE DATA TO FORECAST THEIR UNDERRUNS.

NNWSI PROJECT COST PERFORMANCE GRAPH FOR MAR 1987 WBS: 1.2.5



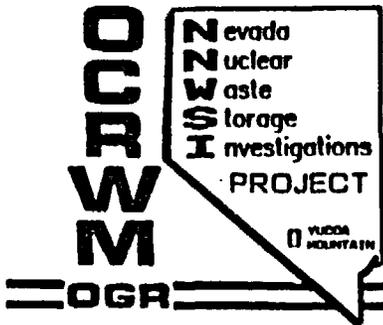
REGULATORY AND INSTITUTIONAL INVESTIGATIONS

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	572.3	3852.9
B. BUDGETED COST OF WORK PERFORMED (BCWP)	503.4	3519.3
C. ACTUAL COST OF WORK PERFORMED (ACWP)	689.6	3975.4
D. BUDGET AT COMPLETION (BAC)		7086.0
E. LATEST REVISED ESTIMATE (LRE)		6623.3

VARIANCES (Year To Date)

	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-333.6	-8.66
G. COST VARIANCE (B-C)	-456.1	-12.96
H. AT COMPLETION VARIANCE (D-E)	462.7	6.53

Remarks:



1.2.5 REGULATORY AND INSTITUTIONAL INVESTIGATIONS
BUDGET ANALYSIS AND PROJECTIONS

<u>COMMENTS</u>	<u>AMOUNT (K)</u>
<u>VARIANCES</u>	
PLAN	\$ -122K <10%
COST	\$ -456K 13%
SCHEDULE	\$ -344K <10%
BUDGET AT COMPLETION	\$ 7,086K
LATEST REVISED ESTIMATE	\$ 8,586K
VARIANCE AT COMPLETION	\$ -1,500K

<u>VARIANCE COMPOSITE</u>	
<u>ANALYSIS AT THE END OF MARCH</u>	
SCP	
COST VARIANCE	\$ -709K
SCHEDULE VARIANCE	\$ -420K

- THE COST VARIANCE FOR THE SCP IS EXPECTED TO DETERIORATE TO \$2,000K AT THE END OF THE FISCAL YEAR BASED ON EXPENDITURES FOR UNPLANNED ACTIVITIES. THE COMMENT RESOLUTION WORKSHOPS HAVE BEEN COMPLETED FOR CHAPTERS 1-5 AND 7. THE CHAPTER 6 WORKSHOP HAS BEEN DELAYED TO MID MAY. THIS DELAY IN REVIEWING CHAPTER 6 MAY WELL DELAY THE SCP PAST THE AUGUST 21, 1987, ISSUANCE DATE.
- THIS ELEMENT IS FORECAST TO OVERRUN BY APPROXIMATELY \$1,500K. THOSE ACCOUNTS WHOSE UNDERRUNS REDUCE THE SCP OVERRUN ARE NRC INTERACTION, REGULATORY MANAGEMENT AND INTEGRATION, REGULATORY REVIEW AND INTEGRATION. NO CORRECTIVE ACTIONS ARE UNDER CONSIDERATION AT THIS TIME.

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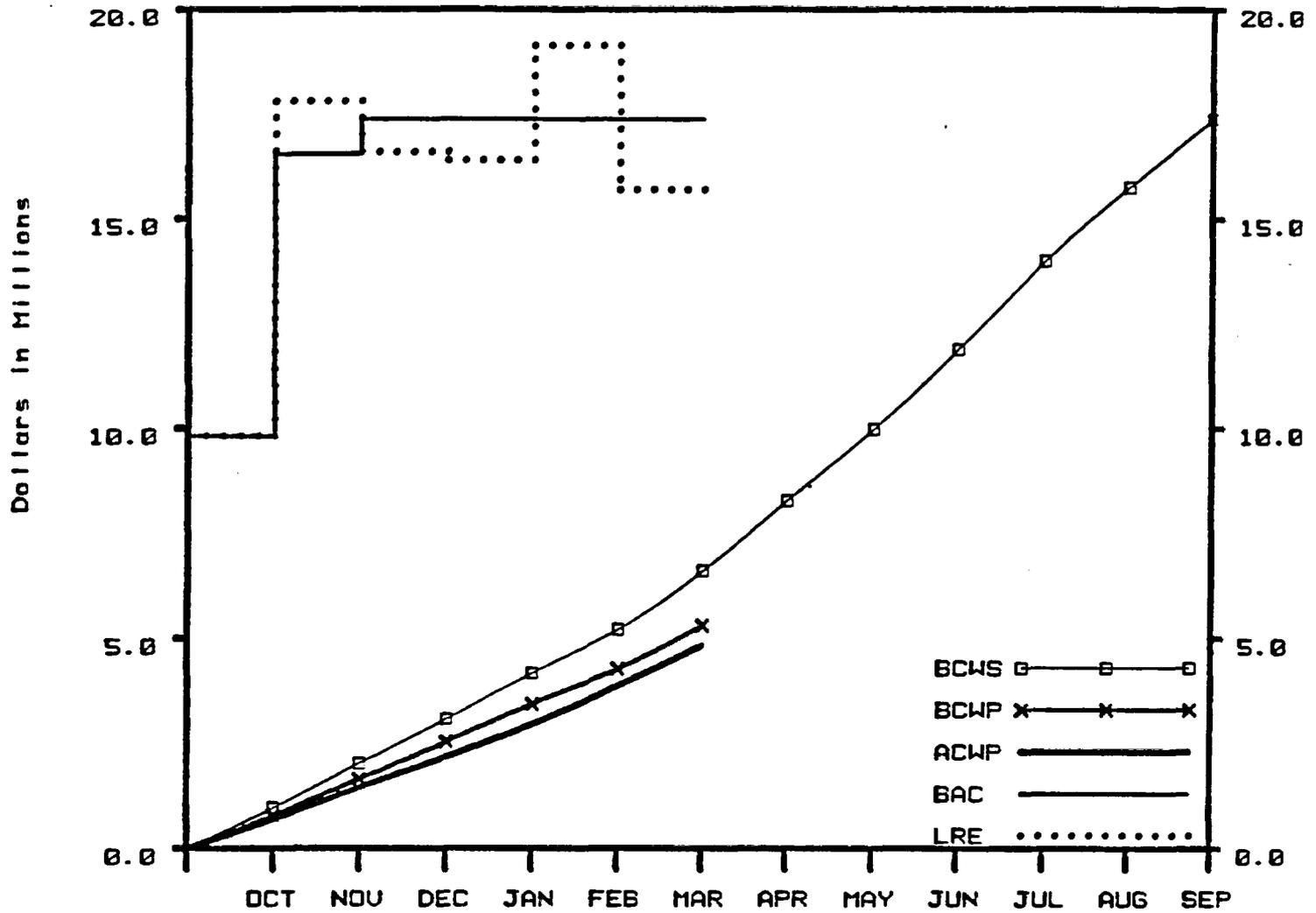
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**1.2.5 REGULATORY AND INSTITUTIONAL INVESTIGATIONS
BUDGET ANALYSIS AND PROJECTIONS (CONTINUED)**

- ALL PARTICIPANTS SHOULD ENSURE THAT THOSE WORKING ON SCP ACTIVITIES ARE CHARGING TO THE SCP.
- OTHER ACTIVITIES SUCH AS POSITION PAPERS AND SCP PROGRESS REPORT INITIATION ARE BEING DELAYED AS A RESULT OF ALL RESOURCES BEING DIVERTED TO COMPLETION OF SCP.

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**NNWSI PROJECT
COST PERFORMANCE GRAPH FOR MAR 1987
WBS: 1.2.6**



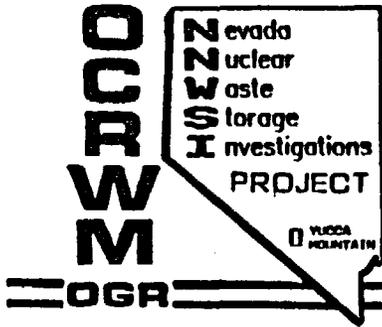
EXPLORATORY SHAFT INVESTIGATIONS

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	1.4	6.6
B. BUDGETED COST OF WORK PERFORMED (BCWP)	1.0	5.3
C. ACTUAL COST OF WORK PERFORMED (ACWP)	1.0	4.8
D. BUDGET AT COMPLETION (BAC)		17.4
E. LATEST REVISED ESTIMATE (LRE)		15.7

VARIANCES (Year To Date)

	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-1.3	-19.74
G. COST VARIANCE (B-C)	0.5	8.88
H. AT COMPLETION VARIANCE (D-E)	1.7	9.68

Remarks:



1.2.6 EXPLORATORY SHAFT INVESTIGATIONS
BUDGET ANALYSIS AND PROJECTIONS

<u>COMMENTS</u>	<u>AMOUNT (K)</u>
<u>VARIANCES</u>	
PLAN	\$ 1,733K 27%
COST	\$ 310K <10%
SCHEDULE	\$-1,500K 22%
BUDGET AT COMPLETION	\$17,370K
LATEST REVISED ESTIMATE	\$10,719K
VARIANCE AT COMPLETION	\$ 6,651K
<u>VARIANCE COMPOSITE</u>	
<u>ANALYSIS AT THE END OF MARCH</u>	
LOS ALAMOS M&I	
SCHEDULE VARIANCE	-19%
COST VARIANCE	-112K

- MANAGEMENT PRIORITIES DURING THE DECEMBER-JANUARY-FEBRUARY TIME FRAME CONCENTRATED ON THE SCP USING RESOURCES THAT WERE ALLOCATED TO THE ESF SURFACE SITE PREPARATION WORK PACKAGE: ADDITIONAL SCOPE WAS ADDED FOR ESF UNDERGROUND CONSTRUCTION AND TESTING. COST VARIANCE DUE TO ADDITIONAL RESOURCES REQUIRED FOR THE REPLAN AND NEW SCOPE.

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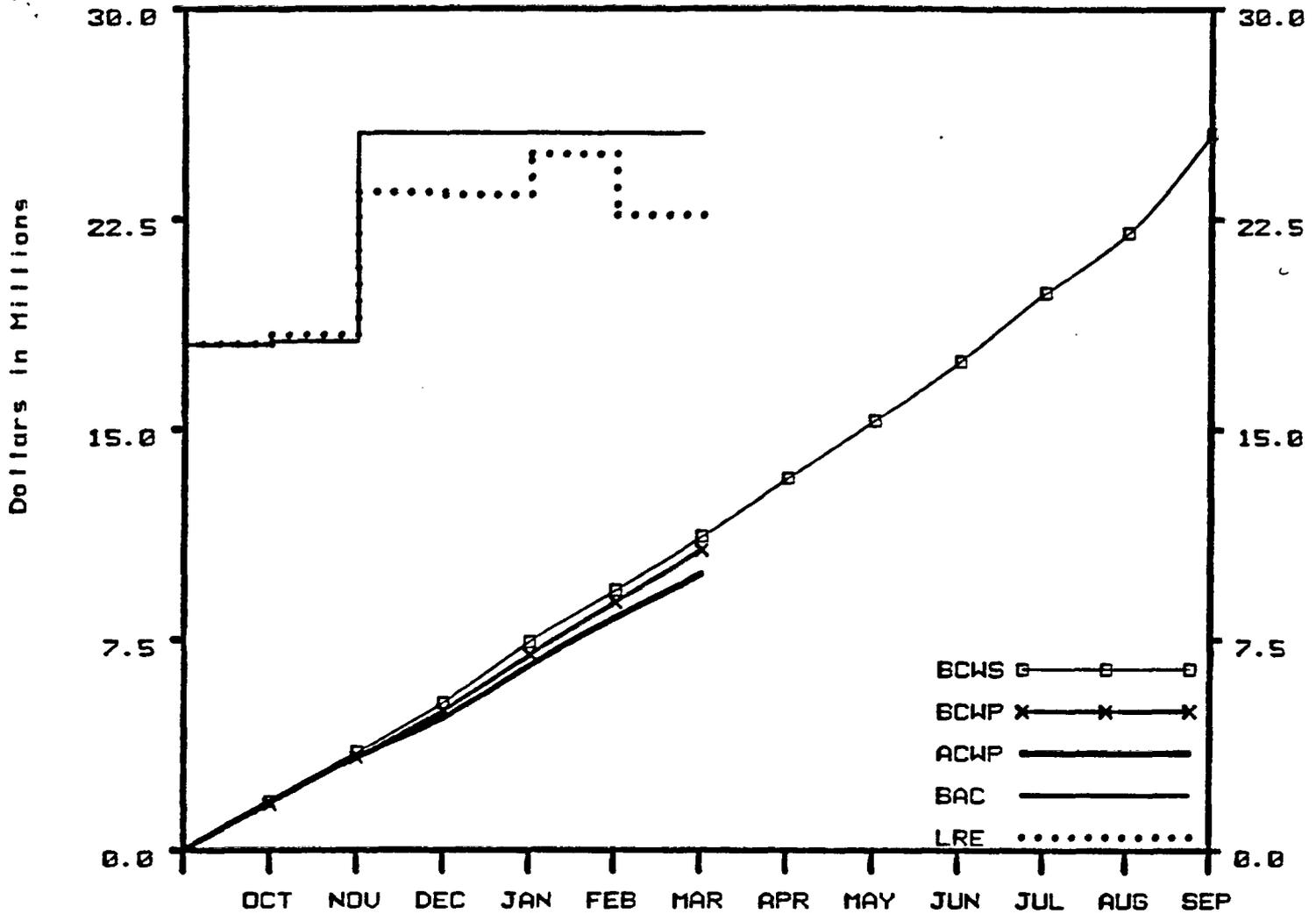
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1.2.6 EXPLORATORY SHAFT INVESTIGATIONS BUDGET ANALYSIS AND PROJECTIONS (CONTINUED)

- UNDERRUNS ARE EXPECTED TO CONTINUE IN DESIGN AWAITING APPROVAL OF SDR DOCUMENT (HQs REQUIRED) PRIOR TO START OF TITLE I DESIGN. TITLE II ENGINEERING IS NOW FORECAST TO BE COMPLETED IN DECEMBER 1987.
- THIS ELEMENT SHOWS RESOURCES PLANNED AT A GREATER LEVEL FOR THE SECOND HALF OF FY 1987 INDICATING A NEED FOR PARTICIPANTS TO RESCHEDULE DESIGN AND TESTING ACTIVITIES TO ACCURATELY SHOW THE PLANNED EXPENDITURES. AN ACCURATE ASSESSMENT OF THE UNDERRUNS CANNOT BE ACCOMPLISHED UNTIL ACTIVITIES AND MILESTONES SLIPPING ARE PROPERLY IDENTIFIED.
- BUDGET UNDERRUN REMAINS IN ESF.

NNWSI PROJECT COST PERFORMANCE GRAPH FOR MAR 1987 WBS: 1.2.9



PROJECT MANAGEMENT

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	1.9	11.2
B. BUDGETED COST OF WORK PERFORMED (BCWP)	1.8	10.7
C. ACTUAL COST OF WORK PERFORMED (ACWP)	1.6	9.8
D. BUDGET AT COMPLETION (BAC)		25.6
E. LATEST REVISED ESTIMATE (LRE)		22.6

VARIANCES (Year To Date)

	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-0.5	-4.32
G. COST VARIANCE (B-C)	0.8	7.92
H. AT COMPLETION VARIANCE (D-E)	2.9	11.48

Remarks:

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**1.2.9 PROJECT MANAGEMENT
BUDGET ANALYSIS AND PROJECTIONS**

COMMENTS

AMOUNT (K)

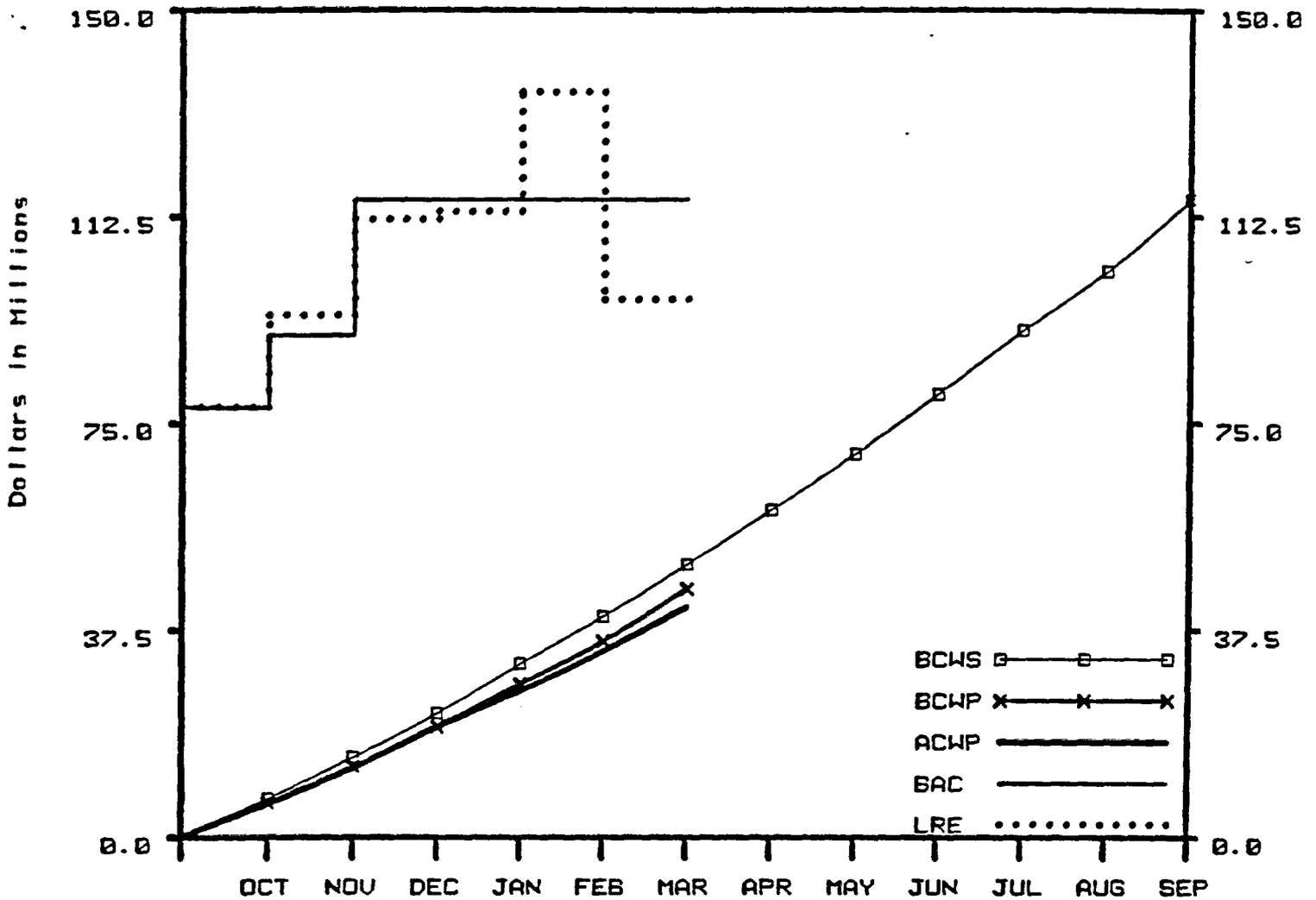
VARIANCES

PLAN	\$ 1,327	12%
COST	\$ 885	<10%
SCHEDULE	\$ -482	<10%
BUDGET AT COMPLETION	\$ 25,551	
LATEST REVISED ESTIMATE	\$ 21,051	
VARIANCE AT COMPLETION	\$ 3,000	

VARIANCE COMPOSITE

- QUALITY ASSURANCE IS UNDERRUN \$1,700K THROUGH THE END OF MARCH. IT IS PROJECTED THAT THE UNDERRUN WILL BE AT LEAST \$2,500K AT THE END OF THE FISCAL YEAR.
- MANAGEMENT AND INTEGRATION IS EXPECTED TO UNDERRUN BY \$700K AT THE END OF THE FISCAL YEAR. HOWEVER, THIS MAY BE REDUCED IF EXPENDITURES INCREASE IN IMS.
- APPROXIMATELY \$1,300K WILL BE BUDGET SHIFTED FROM 1.2.9 TO THE STATE GRANT.

NNWSI PROJECT COST PERFORMANCE GRAPH FOR MAR 1987 WBS: 1.2



NNWSI - TOTAL

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	9.4	49.4
B. BUDGETED COST OF WORK PERFORMED (BCWP)	9.5	45.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	7.9	41.6
D. BUDGET AT COMPLETION (BAC)		115.6
E. LATEST REVISED ESTIMATE (LRE)		97.4

UARIANCES (Year To Date)

	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-4.4	-8.96
G. COST VARIANCE (B-C)	3.4	7.46
H. AT COMPLETION VARIANCE (D-E)	18.1	15.69

Remarks:

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**1.2 NNWSI PROJECT
PROJECTED UNDERRUNS AT END FY 1987**

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<u>ELEMENT</u>	<u>AMOUNT (K)</u>
SYSTEMS	\$ 900
WASTE PACKAGE	500
SITE INVESTIGATIONS	10,836
REPOSITORY	2,000
REGULATORY & INSTITUTIONAL	-1,500
ESF	6,650
TEST FACILITIES	100
PROJECT MANAGEMENT	3,000
STATE GRANT (DEPENDS ON INVOICE CYCLE)	
UNDISTRIBUTED BUDGET	

ESTIMATED UNDERRUN 22,486

- THE COST UNDERRUN IS EXPECTED TO DETERIORATE TO 22.4 MILLION THROUGH THE END OF THE FISCAL YEAR BASED ON COST ANALYSIS AND PAST TRENDS. THE PLANNED BUDGET FOR THE SECOND HALF OF THE FISCAL YEAR INCREASES BY 40% TO 70 MILLION.
- THE SPEND RATE PER MONTH FOR THE FIRST HALF OF FY 87 WAS \$6,934K. USING THIS AS A COMPARISON WOULD INDICATE AN UNDERRUN OF APPROXIMATELY 37 MILLION. HOWEVER, ACTUALS FOR MARCH WERE \$8.0. THIS SPEND RATE WOULD RESULT IN A 27 MILLION UNDERRUN.
- THE ABOVE CONDITION INDICATES THE NEED TO ASSESS IN DETAIL OUR EFFORTS FOR THE REMAINING PORTION OF FY 1987 WHICH WILL PROVIDE THE FRAMEWORK FOR PLANNING FY 1988. ALL PARTICIPANTS ACCURATELY FORECAST OUR UNDERRUNS AND ENSURE THAT THE ACTIVITIES AND MILESTONES ARE IDENTIFIED.

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Nevada Nuclear Waste Storage Investigations Project

CONFIGURATION MANAGEMENT

FY-87 STATUS REPORT

NOTE: R. Belyea Presentation
to PM-TPO Meeting 4/22/87



**United States Department of Energy
Nevada Operations Office/Waste Management Project Office**



Science Applications International Corporation

L87-CM-RB-124

April 15, 1987

TO: Distribution

SUBJECT: Change Control Board (CCB) Meeting Minutes, Milestone Report and NNWSI Project Change Control Log.

Enclosed are the subject data for your use. They include:

1. CCB Meeting Minutes dated April 15, 1987.
2. Milestone Report with CCB Log Numbers, sorted by WBS, Schedule date and event between 01-Oct-86 and 30-Sept-87. Milestone Report date April 16, 1978.
3. NNWSI Project Change Control Log, which has normally been sent out with CCB approved records. Since this document is linked to the "revised" Milestone Report, which now offers the CCB Log numbers, we will send the log at frequent intervals, rather than only after the CCB meetings.

The CCB approved Cost/Schedule Change Request and an updated Change Control Log will be distributed the week of 20-April-87. If you have any question, please call R. Belyea or Elena Ruth at X-5832.

SCIENCE APPLICATIONS
INTERNATIONAL CORPORATION

R. Belyea, Secretary
Change Control Board

RB/evr

cc w/encl:

E. W. Shepherd, SNL, 6310, Albuquerque, NM
T. O. Hunter, SNL, 6310, Albuquerque, NM
D. T. Oakley, LANL, Los Alamos, NM
L. D. Ramspott, LLNL, Livermore, CA
Project File 1.2.1.2.5.2

cc wo/encl:

M. Spaeth
W. Macnabb/W. Devlin
J. LaRiviere
S. Klein/S. Metta
M. Foley
M. Voegele
C. Jonson/R. Sweeney

Valley Bank Center, 101 Convention Center Drive, Suite 407, Las Vegas, Nevada 89109, (702) 295-1204

Technical & Management Support Services Contractor Nevada Nuclear Waste Storage Investigations

Other SAIC Offices: Albuquerque, Chicago, Dayton, Denver, Huntsville, Los Angeles, Oak Ridge, Orlando, San Diego, San Francisco, Tucson and Washington, D C

MINUTES

NNWSI PROJECT CHANGE CONTROL BOARD

April 15, 1987

CCB Meeting Attendees: Mitch Kunich (WMPO), Nate Morely (WMPO),
Dick Belyea (SAIC), Jack Smith (SAIC), Tom Steele (SAIC), Dave
Jorgenson (SAIC)

1. The meeting was opened by M. Kunich, Chairman.
2. Changes to the Planning and Scheduling Baseline is as follows:

SYSTEM WBS# 1.2.1

- o WBS# 1.2.1.3.3.S - SNL - C/SCR 87/086 - Change WBS and date of Level 2 Milestone R080 - Status Report of NNWSI data-base capabilities
 - CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.1.2.1.S and 1.2.1.2.1.X - SNL- C/SCR 87/095 - Change the Description of Level 1 Milestone M261 and Add to the Baseline the following Level 2 Milestones: M769, M770, M290
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.1.1.S and 1.2.1.1.X - SNL - C/SCR 87/094 - Add to the Baseline the following Level 2 Milestones: M730, M731 and M772
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.1.2.4.X and 1.2.1.2.4.S - SNL - C/SCR 87/150 - Add to the Baseline Level 2 Milestone M761, M293, M762 and M766. Change the description and criteria on Level 1 Milestone M108, and change the criteria of Level 1 Milestone R074.
 - CCB Action: Deferred April 15, 1987.
 - Comments: Pending for further review.

WASTE PACKAGE WBS# 1.2.2

- o WBS# 1.2.2.4.L - WMPO - C/SCR 86/169 - Change WBS, responsibility, description, planned dates, and criteria for Class 1, Level 1 Milestone M013 - Revised Draft Waste Package Subsystem Conceptual Design Requirements to DOE/HQ for review
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.

SITE WBS# 1.2.3

- o WBS# 1.2.3.5.1.T - SAIC - C/SCR 87/100 - Sample Management Facility to the NNWSI Project WBS Dictionary and the Baselined WBS
 - CCB Action: Deferred April 15, 1987
 - Comments: Inconsistencies, need cleaning up.
- o WBS# 1.2.3.7.T - SAIC - C/SCR 87/013 - Delete Level 2 Milestones R550, R557, R558, and N312
 - CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.3.4.1.9.A - LANL - C/SCR 87/088 - Add WBS Element 1.2.3.4.1.9.A - Biological Sorption and Transport to the WBS dictionary and to the Project WBS
 - CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.

REPOSITORY WBS# 1.2.4

- o WBS# 1.2.4.1.1.S - SNL - Tom Hunter - C/SCR 87/105 - Baseline Level 2 Milestone P195 - Inform WMPO/NV that SNL and the Design Contractor are ready to start Repository Advanced Conceptual Design (ACD) activities
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.4.4.S - SNL - Tom Hunter - C/SCR 87/063 - Delete Level 2 Milestone M471 - Submit Draft Repository Support Operation Plan
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.4.4.X - WMPO - C/SCR 87/093 - Delete Level 1, Class 3 Milestone R692, Interim OCRWM Systems Position on Spent Fuel Rod Consolidation at the Repositories and MRS-Review and Comment
 - CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.

Minutes - NNWSI Project
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- o WBS# 1.2.4.6.2.S - SNL - C/SCR 87/058 - Delete Level 2 Milestone N413 - Minimum Borehole Spacing
 - CCB Action: Deferred April 15, 1987.
 - Comments: SNL for further action.
- o WBS# 1.2.4.6.2.S - SNL - C/SCR 87/069 - Change date of Level 2 Milestone M414 - Draft Report on Far-Field Thermal Mechanical Effects
 - CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.4.6.2.S and WBS# 1.2.4.6.2.X - SNL - C/SCR 87/107 - Baseline Level 2 Milestones P216, P217, and P218
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.

REGULATORY AND INSTITUTIONAL WBS# 1.2.5

- o None.

EXPLORATORY SHAFT READINESS REVIEW WBS# 1.2.6.1.1

- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/111 - Change the description, scheduled date and criteria of Milestone M243
 - CCB Action: Deferred April 15, 1987.
 - Comments: To D. Irby and N. Morley for further review.
- o WBS# 1.2.6.1.1.A to 1.2.6.1.1.X - LANL - D. T. Oakley - C/SCR 87/114 - Change Level 1 Milestone M652, Start First Shaft (ES-1) Construction, as follows:
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/159 - Add to the baseline the following Level 2 Milestone: T125 Final ESF Surface/Site Preparation Readiness Review Procedure completed
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.

- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/158 - Add to the baseline the following Level 2 Milestone: T124 Draft ESF Surface/Site Preparation Readiness Review Procedure completed
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/160 - Add to the baseline the following Level 2 Milestone: T126 Draft ESF Shaft Construction and Testing Readiness Review Procedure completed
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/161 - Add to the baseline the following Level 2 Milestone: T127 Final ESF Shaft Construction and Testing Readiness Review Procedure completed
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/172 - Baseline the following Level 1 Milestone R033 - Complete Exploratory Shaft Construction and Testing Readiness Review meeting
 - CCB Action: Deferred April 15, 1987.
 - Comments: Pending for further review.
- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/162 - Add to the baseline the following Level 2 Milestone: T128 Draft ESF Underground Construction REadiness Review Procedure completed
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/163 - Add to the baseline the following Level 2 Milestone: T129 Final ESF Underground Construction Readiness Review Procedure completed
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/168 - Add to the baseline the following Level 1 Milestone: T134 complete ESF Underground Construction Readiness Review meeting
 - CCB Action: Deferred April 15, 1987.
 - Comments: D. Irby and T. Merson to further review.
- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/164 - Add to the baseline the following Level 2 Milestone: T130 Draft ESF Underground Testing Readiness Review Procedure completed
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.

- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/165 - Add to the baseline the following Level 2 Milestone: T131 Final ESF Underground Testing Readiness Review Procedure complete
- CCB Action: Approved April 15, 1987 for M. Kunich's signature.

Exploratory Shaft Facility Subsystems Design Requirements Document
WBS# 1.2.6.1.1

- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/110 - Reduction of Los Alamos National Laboratory Activities under WBS 1.2.6 - Milestone R241
- CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.

RFP for ESF Shaft and Mining Subcontract - WBS# 1.2.6.1.1

- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/112 - Change Level 1 (Class 3) Milestone MO22, ESF Shaft and Mining Subcontract awarded, as follows:
 - CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.
 - o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/119 - Change Milestone MO20, Issue RFP and ESF Shaft and Mining Subcontract, as follows:
 - CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.
 - o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/120 - Change Milestone MO21, Prebid Conference for ESF Shaft and Mining Subcontract complete, as follows:
 - CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.
 - o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/121 - Change Milestone MO25. All bids received on ESF Shaft and Mining Subcontract, as follows:
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- **Action Item** Notify Reeco of Criteria changes**

ESF SURFACE TITLE II DESIGN - WBS# 1.2.6.1.1

- o WBS# 1.2.6.1.1.A - LANL - D. T. Oakley - C/SCR 87/116 - Change Level 1 Milestone M613, Issue the revision of the ESF Title II Design for Subcontractor Bid Package, as follows
 - CCB Action: Deferred April 15, 1987.
 - Comments: To D. Irby and T. Merson for further review.
- o WBS# 1.2.6.1.1.A - D. T. Oakley - C/SCR 87/117 - Change Milestone M642, Issue revised Surface Title II Design for ESF, as follows:
 - CCB Action: Deferred April 15, 1987.
 - Comments: To D. Irby and T. Merson for further review.

SUBSURFACE TITLE I ENGINEERING - WBS# 1.2.6.1.1.F

- o WBS# 1.2.6.1.1.F - F&S - R. Bullock - C/SCR 87/175 - Baseline Level 2 Milestone P073 - Subsurface Title I Engineering complete
 - CCB Action: Deferred April 15, 1987.
 - Comments: Incomplete, pending for further review by D. Irby and G. Heitland.
- o WBS# 1.2.6.1.1.F - F&S - R. Bullock - C/SCR 87/174 - Baseline Level 2 Milestone R575 - Subsurface Engineering Studies complete
 - CCB Action: Incomplete, pending for further review by D. Irby and G. Heitland.

ESF SITE PREPARATION WBS# 1.2.6.2

- o WBS# 1.2.6.2 - LANL - D. T. Oakley - C/SCR 87/113 - Change Milestone M645, start ESF Site Preparation, as follows:
 - CCB Action: Deferred April 15, 1987.
 - Comments: To D. Irby and T. Merson for further review.

ES WBS DICTIONARY CHANGES - WBS# 1.2.6.1.2 AND 1.2.6.1.3

- o WBS# 1.2.6.1.2 - LANL - D. T. Oakley - C/SCR 87/125 - Change NNWSI Project WBS and NNWSI Project WBS dictionary 1.2.6.1.2. - Safety and Quality
 - CCB Action: Deferred April 15, 1987.
 - Comments: Incomplete, pending for G. Heitland review.
- o WBS# 1.2.6.1.3 - LANL - D. T. Oakley - C/SCR 87/126 - Add to the NNWSI Project WBS and NNWSI Project WBS Dictionary 1.2.6.1.3 - Safety
 - CCB Action: Incomplete, pending for G. Heitland review.

ES TESTING WBS# 1.2.6.9

- o WBS# 1.2.6.9.1.A - LANL - D. T. Oakley - C/SCR 87/169 - Baseline Level 2 Milestone M287: Complete Draft ES Test Implementation and Control Plan
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.1.A - LANL - D. T. Oakley - C/SCR 170 - Change the schedule date, WBS number, description, and criteria of Level 2 Milestone: M651 - Issue ES Test Implementation and Control Plan
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.2.4.1.A - LANL - D. T. Oakley - C/SCR 87/123 - Change Milestone M693, Begin Chlorine 36 Dating Pore Water Test, as follows:
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.2 - LANL - D. T. Oakley - C/SCR 87/115 - Change the scheduled date of Milestone M612
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.2.4.A - LANL - D. T. Oakley - C/SCR 87/122 - Change the criteria and the scheduled date of Milestone R321
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.3.A - LANL - D. T. Oakley - C/SCR 87/124 - Change the scheduled date of Milestone R612
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.

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- o WBS# 1.2.6.9.3.A - LANL - D. T. Oakley - C/SCR 87/166 - Add to the baseline the following Level 2 Milestone: T064 IDS revised requirements document issued
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.3.A - LANL - D. T. Oakley - C/SCR 87/171 - Change the description and schedule date of Level 2 Milestone M667 - Complete IDS Surface Acquisition System and Surface Sensors
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.1.X - LANL - D. T. Oakley - C/SCR 86/203 - Add to the baseline, Level 2 Milestone P048 - WMPO review of the Draft Exploratory Shaft Test Plan (ESTP) (NVO-244) complete
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.1.A - LANL - D. T. Oakley - C/SCR 86/204 - Change the baselined date for Level 2 Milestone M085 - Deliver Camera-ready Copy NVO-244 (ESTP) to WMPO
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.1.A - LANL - D. T. Oakley - C/SCR 86/202 - Add to the baseline, Level 2 Milestone P043 - Deliver Draft Exploratory Shaft Test Plan (ESTP) (NVO-244) to WMPO
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.1.A - LANL - D. T. Oakley - C/SCR 86/201 - Change the date of Level 2 Milestone M649 - Completion of DOE/NCR Workshop on ESTP
 - CCB Action: Approved April 15, 1987 for M. Kunich's signature.
- o WBS# 1.2.6.9.1.A - LANL - D. T. OAKLEY - C/SCR 87/167 - ADD TO THE baseline the following Level 1 Milestone: T133 complete ESF. Shaft Facility Underground Testing Readiness Review Meeting.
 - CCB Action: Deferred April 15, 1987.
 - Comments: Pending further evaluation from D. Irby and T. Merson.

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- o WBS# 1.2.6.9.1.A - WMPO - M. Kunich - C/SCR 86/193 - Change the date, responsibility, criteria and WBS of Level 2 Milestone M666 - Issue Exploratory Shaft Test Plan (ESTP) (NVO-244)

- CCB Action: Approved with changes April 15, 1987 for M. Kunich's signature.

TEST FACILITIES - WBS# 1.2.7

- o None.

LAND ACQUISITION - WBS# 1.2.8

- o None.

PROJECT MANAGEMENT - WBS# 1.2.9

- o None.

3. Meeting adjourned by Chairman

RB/evr

FY 87 STATUS REPORT

MILESTONE REPORT WITH CCBLOG NUMBER
SORTED BY WBS, SCHEDULE DATE AND EVENT
BETWEEN 01 Oct 86 AND 30 Sep 87
19 April 87

EVENT: P545 LEVEL: 2 WBS: 1.2.3.1.X RESP: WMPO STATUS: P WMPO RESP: Blanchard

NVO PLANNED: 15 Sep 87
NVO EXPECTED:
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Complete the Review of Draft Updated Field Activities Plan (WBS 1.2.3)

CRITERIA: This milestone will be satisfied by the submittal of written comments on the draft Field Activities Plan (FAP) to SAIC, Manager, Site Integration Group. A copy of the cover letter will be sent to the Configuration Management Branch to notify it of completion of the milestone.

APPROVAL FLAG: MSA_FLAG: LEADER: Blanchard RESPON. STAFF: D'Lugosz

COMMENT: Requires C/SCR to Baseline

EVENT: P139 LEVEL: 2 WBS: 1.2.3.5.1.X RESP: WMPO STATUS: P WMPO RESP: Levich

NVO PLANNED: 22 Jan 87
NVO EXPECTED:
NVO ACTUAL: 12 Feb 87

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Issue WMPO/NV Approval to Start Sample Management Facility (SMF) Procurement and Staffing

CRITERIA: WMPO/NV makes a decision regarding the location of the SMF. WMPO/NV issues written instructions and authorization for procurement of SMF facilities. WMPO/NV issues written instructions and authorization to begin staffing and equipment procurement activities for SMF.

APPROVAL FLAG: MSA_FLAG: LEADER: RESPON. STAFF:

COMMENT: Transmittal Letter: WMPO:MBB-106, dtd. 2/12/87.
Actual, Approved CCB 2/12/87

NOTE: VUGRAPH FROM R. BELYEA PRESENTATION

Changes thru 4/15/87

NNWSI PROJECT CHANGE CONTROL LOG
ADJUSTMENTS TO BASELINE
21 April 87

CHANGE NUMBER	SUBMIT DATE	APPROVAL DATE	DESCRIPTION & REASON FOR ADJUSTMENT	P&S ACCT.		LABOR/ODC	
				FROM	TO	ADJUSTMENT	ADJ. BUDGET
87/014	10/30/86 SAIC	1/16/87	Change the Descriptions, Criteria, Levels, and Delivery Dates For the Following Level 2 Milestones—N247, N248, N249, N372, N373, N374, P030, R552, R553, R554, and R555				
			MILESTONE(S) N248 P030 R552 R553 R554 R555				
87/015	10/30/86 SAIC	3/17/87	Change WBS 1.2.5.5.N – Financial and technical Assistance to WBS 1.2.10.1.N – Financial and technical Assistance, and also add WBS 1.2.10.1.N to the WBS Dictionary	1.2.5.5.N	1.2.10.1.N		
87/016	10/20/86 SAIC	10/24/86	Rebaseline the FY 87 Budget for the NNWSI Project to Reconcile with the October 1987 Approved Funding Program (AFP) of \$79,281,000.				
				—NONE—	1.2.3.3.4.B		117
				—NONE—	1.2.3.5.1.T		
				—NONE—	1.2.5.3.4.T		130
				—NONE—	1.2.5.A.1.N		3,785
				—NONE—	1.2.9.9.X		980
				—NONE—	1.2.B.1.Z		1,428
				1.2.1.1.S	1.2.1.1.S	-101	188
				1.2.1.1.T	1.2.1.1.T	-305	100
				1.2.1.2.1.S	1.2.1.2.1.S	-73	107
				1.2.1.2.2.S	1.2.1.2.2.S	-105	225
				1.2.1.2.3.S	1.2.1.2.3.S	-114	71
				1.2.1.2.4.A	1.2.1.2.4.A	21	190
				1.2.1.2.4.G	1.2.1.2.4.G	-30	100
				1.2.1.2.4.L	1.2.1.2.4.L	-45	140

NOTE: VUGRAPH FROM R. BELYEA PRESENTATION

NNWSI PROJECT COST/SCHEDULE CHANGE REQUEST (C/SCR)

**** EXAMPLE ****

11-AD-008

CHANGE NO.	ORGANIZATION	ORIGINATOR	ORIGNATION DATE
87/024	SNL	T.O. Hunter	11/18/86

TITLE: Change Description and Criteria of Level 1, Class 1 Milestone P404 - Prepare Design Requirements and Materials Recommendation Report

EXPLANATION & REASON FOR CHANGE:

DATE Presented at CCB Meeting 3/23/87 Date Presented at TPO Meeting _____

DATE APPROVED 3/23/87

DATE DEFERRED _____ DATE DISAPPROVED _____

COMMENTS Deleted C/SCR 87/139 - This Change Request is incorporated with this C/SCR.

Received in CM <u>1-3-87</u>	Analyst Review date <u>1-12</u>	Sent to Planners <u>1-17</u>	To Sch. <u>2-4</u>
Returned to CM <u>1-13-87</u>	Returned to Analyst <u>1-.5</u>	Sent to Planners _____	To Sch. _____
Returned to CM <u>1-17-87</u>	Returned to Analyst _____	Sent to Planners _____	To Sch. _____
Returned to CM <u>2-28</u>	Returned to Analyst <u>3-4</u>	Sent to Planners _____	To Sch. _____
Returned to CM <u>3-9</u>	Returned to Analyst <u>3-12</u>	Sent to Planners _____	To Sch. _____
Returned to CM <u>3-15</u>	Returned to Analyst _____	Sent to Planners _____	To Sch. _____
Returned to CM _____	Returned to Analyst _____	Sent to Planners _____	To Sch. _____

RESPONSIBLE ORGANIZATION: _____ DATE: _____

CCB SECRETARY: _____ DATE: _____

APPROVAL: DIRECTOR, WMPO: _____ DATE: _____

NOTE: From R. Belyea Presentation

FY 87 STATUS REPORT - WMPO

WMPO TOTAL MILESTONES	.....	45
Baseline Level 1	.....	0
Baseline Level 2	.....	4
Planning Level 1	.....	6
Planning Level 2	.....	<u>35</u>
Total	-	45

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 41 *

* Includes need for Writing 6 Criteria

RECOMMENDED PLAN TO ACCOMPLISH

I. Baseline - WBS Groups (Milestones per C/SCR)

1.2.1.1	.....	3	1.2.5.4	.....	2
1.2.1.2	.....	2	1.2.5.5	.....	1
1.2.1.3	.....	1	1.2.6.1	.....	2
1.2.2.4	.....	1	1.2.9.1	.....	9
1.2.3.1	.....	1			
1.2.2.4	.....	1			
1.2.3.1	.....	4			
1.2.3.5	.....	5			
1.2.4.1	.....	4			
1.2.4.2	.....	3			
1.2.4.4	.....	1			
1.2.5.2	.....	1			
1.2.5.3	.....	1			

FY 87 STATUS REPORT - SAIC

SAIC TOTAL MILESTONES	149
Baselined Level 1	0
Baselined Level 2	32
Planned Level 1	1
Planned Level 2	<u>116</u>
Total -	149

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 117 *

*Includes need for Writing 17 Criteria

FY 87 STATUS REPORT - SAIC

RECOMMENDED PLAN TO ACCOMPLISH

I. Baseline - WBS Groups (Milestones per C/SCR)

1.2.3.1	...	6
1.2.3.5	...	18
1.2.3.6	...	15
1.2.3.7	...	14
1.2.5.1	...	2
1.2.5.2	...	12
1.2.5.3	...	10
1.2.5.4	...	1
1.2.8	...	6
1.2.9.1.1	...	7
1.2.9.1.4	...	3
1.2.9.2	...	6
1.2.9.3	...	<u>10</u>

SUB - 110

II. Baseline Approval Actual- 6 (By Secretary Board)

TOTAL - 116

III. Milestone Review - TPO Action Change Level 2 to Level 3

FY 87 STATUS REPORT - SNL

SNL TOTAL MILESTONES	.....	96
Baselined Level 1	.....	0
Baselined Level 2	.....	27
Planned Level 1	.....	0
Planned Level 2	.....	<u>69</u>
	Total -	96

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 69 *

*Includes need for Writing 17 Criteria

FY 87 STATUS REPORT - SNL

RECOMMENDED PLAN TO ACCOMPLISH

I. Baseline - WBS Groups (Milestones per C/SCR)

1.2.1.1	....	4
1.2.1.2	....	5
1.2.1.3	....	2
1.2.1.4	....	2
1.2.3.2	....	2
1.2.4.1	....	4
1.2.4.2	....	9
1.2.4.4	....	1
1.2.4.6	....	2
1.2.5.2	....	21
1.2.6.9	....	3
1.2.9.1	....	3
1.2.9.2	....	<u>1</u>

Total - 69

II. Recommend Secretary of Board .. Approve Actuals

III. Recommend Secretary of Board .. Approve "Housekeeping Change"

FY 87 STATUS REPORT - LANL

LANL TOTAL MILESTONES	.....	53
Baselined Level 1	.....	0
Baselined Level 2	.....	17
Planning Level 1	.....	1
Planning Level 2	.....	<u>35</u>
Total	-	53

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 35*

* Includes need for Writing 29 Criteria

RECOMMENDED PLAN TO ACCOMPLISH

I. Baseline - WBS Groups (Milestones per C/SCR)

1.2.3.2	....	1
1.2.3.4.1	....	19
1.2.3.4.2	....	7
1.2.3.4.3	....	2
1.2.5.2	....	5
1.2.6.1	....	<u>1</u>
Total	-	35

FY 87 STATUS REPORT - LLNL

LLNL TOTAL MILESTONES	20
Baselined Level 1	0
Baselined Level 2	10
Planned Level 1	0
Planned Level 2	<u>10</u>
Total -	20

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 10

RECOMMENDED PLAN TO ACCOMPLISH

I. Baseline WBS Groups (Milestones per C/SCR)

1.2.2.2	2
1.2.2.3	4
1.2.2.4	2
1.2.3.8	1
1.2.5.2	<u> </u>
	10

FY 87 STATUS REPORT - USGS

USGS TOTAL MILESTONES	.....	7
Baselined Level 1	.....	0
Baselined Level 2	.....	0
Planned Level 1	.....	1
Planned Level 2	.....	<u>6</u>
Total		7

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 7

RECOMMENDED PLAN TO ACCOMPLISH

I Baseline - WBS Groups (Milestones per C/SCR)

Level 2 - 1.2.3.2	.....	1	-	Submit C/SCR with Criteria
1.2.3.3	.....	3	-	" " " " " "
1.2.5.2	.....	2		" " " " " "
Level 1 1.2.3.2	.....	1		Submit Criteria to Secretary of Board; This is an Actual Secretary permitted to approve after review with Chairman
Total		<u>7</u>		

FY 87 STATUS REPORT - REECO

REECO TOTAL MILESTONES	.....	12
Baselined Level 1	.....	0
Baselined Level 2	.....	0
Planned Level 1	.....	0
Planned Level 2	.....	<u>12</u>
Total		12

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 12

RECOMMENDED PLAN TO ACCOMPLISH

I. Baseline WBS Groups (Milestones per C/SCR)

1.2.3.5	.....	3
1.2.6.2	.....	1
1.2.6.3	.....	1
1.2.6.4	.....	5
1.2.6.6	.....	<u>2</u>
Total		12

FY 87 STATUS REPORT - H&N

H&N TOTAL MILESTONES	.....	3
Baselined Level 1	.....	0
Baselined Level 2	.....	0
Planned Level 1	.....	0
Planned Level 2	.....	<u>3</u>
Total		3

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 3

RECOMMENDED PLAN TO ACCOMPLISH

I. Baseline - WBS Groups (Milestones per C/SCR)

1.2.6.1 ... 3

FY 87 STATUS REPORT - F&S

F&S TOTAL MILESTONES	....	2
Baselined Level 1	....	0
Baselined Level 2	....	0
Planned Level 1	....	0
Planned Level 2	....	2

CCB ACTION TO ACHIEVE June 30, 1987 GOAL = 2

RECOMMENDED PLAN TO ACCOMPLISH

I. Meet with Secretary CCB, Prepare C/SCRs,

CCB ACTIONS 87/174, 87/175 - Deferred Chairman CCB 4/15/87

FY 87 STATUS REPORT - NNWSI PROJECT TOTAL

Baselined Level 1	....	0
Baselined Level 2	....	90
Planning Level 1	....	9
Planning Level 2	....	<u>288</u>
Total	....	387

BY PARTICIPANT - TOTAL ONLY

WMPO	...	45
SAIC	...	149
SNL	...	96
LANL	...	53
LLNL	...	20
USGS	...	7
REECO	...	12
F&S	...	2
H&N	...	<u>3</u>
Total	..	387

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Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

DO NOT
REPRODUCE

DOGR

Paul Chestholt

1

STATUS OF THE SEMP

Briefing to April 1987 TPO meeting by
T. O. Hunter, SNL, on behalf of the
SEIG Chairman.

THE SYSTEMS ENGINEERING MANAGEMENT PLAN (SEMP) IS:

- Complete (forwarded to WMPO on
March 31, 1987)
- Awaiting WMPO approval for
forwarding to HQ
- Closely coupled to AP-3.3 since
SEIG technical overview and
assessment is fundamental to
Project Baselineing and Change
Control of the Baseline.

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Investigations
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MOUNTAIN

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STATUS OF THE SEIG

2

The SEIG is ready to proceed, BUT:

- SEIG needs a Program-approved SEMP

- SEIG needs to develop detailed procedures

[SEIG is proceeding to develop these procedures "at-risk", pending approval of SEMP]

- SEIG needs an approved Charter

[SEIG is drafting a proposed Charter for WMPO consideration]

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PROJECT

DO NOT
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IMPLEMENTATION IS NEEDED NOW

The NNWSI Project is at a stage where expeditious SEMP implementation (independent of ACD date) is needed.

Implementation is needed for:

- Establishing Project Credibility
- Satisfying OGR SEMP requirements
- Providing integration of Project technical activities
- Satisfying QA needs for technical interface requirements
- Providing a basis for finalizing other technical Project plans (e.g., Reg. Comp. Plan, SIMP, etc.)
- Initiating and maintaining Project Baseline documents consistent with the CMP and AP-3.3

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PROJECT**

**NEVADA
MOUNTAIN**

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**ROLES DELINEATED IN THE SEMP
AND IN AP-3.3**

- * SAIC/CMO's role is in managing Baseline Change Requests (BCRs)
- * SAIC/SEO's role is in providing impact assessments of BCRs
- * TPO's, Branch Chief's and CCB's role is in approving BCRs
- * SEIG's role is in reviewing and recommending on, or in reviewing and concurring on, BCRs

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FIVE CLASSES OF CHANGES SPECIFIED
SPECIFIED IN THE SEMP AND IN AP-3.3 ⁸

- * CLASS 0 -- Initiates a baselined document or comprehensively updates a baselined document
- * CLASS 1 -- For a Baseline Change requiring OGR approval
- * CLASS 2 -- For a Baseline Change requiring NNWSI CCB approval
- * CLASS 3 -- For a Baseline Change requiring NNWSI Branch Chief approval
- * CLASS 4 -- For a Baseline Change requiring only a single TPO's approval

Submits NNWSI site rept for 870401-0630. Topics discussed include audits of LASL & Sandia during wks of 870330 & 0401, respectively.	8712100182	430	06/26/1987	Publicly	8712100182	PDR:WASTE--WM-11-870626,PDR:WASTE//WM-11870626	PDR:WASTE//WM-11870626	43656:268-43657:337
Forwards *NNWSI Project Monthly Rept for Apr 1987.*	8712100185	2	07/28/1987	Publicly	8712100185*	PDR:WASTE--WM-11-870728,PDR:WASTE//WM-11870728	PDR:WASTE//WM-11870728	43656:074-43656:267