

*Need
enclosure
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Reply to:

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M E M O R A N D U M

DATE: September 2, 1987

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

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

SUBJECT: NNWSI Site Report for Months of July and August, 1987

I. QUALITY ASSURANCE

A. Enclosed are the reports for NNWSI QA Audits 87-3, Lawrence Livermore National Laboratory, April 27 through May 1, 1987, and 87-4, Science Applications International Corporation (SAIC), June 15 through June 22, 1987. The NRC did not have an observer present at either of these audits. Also enclosed are three Standard Deficiency Reports (SDR's) issued to Lawrence Livermore National Laboratory on June 18, 1987 as a result of supplemental QA audit S-87-1.

8712090302 870902
PDR WASTE
WM-11 PDR

88132255
WM Project: WM-11
1 PDR w/encl
(Return to WM. 623-SS)

14
WM Record File: 102
LPDR w/encl

The subject of the supplemental audit was the traceability of Well J-13 water samples collected by LLNL personnel at the Nevada Test Site and shipped to LLNL in Livermore, California. Apparently, QA procedures were not followed in that the water samples were collected without the knowledge of the DOE Nevada Test Site Office (NTSO). Further, Quality Assurance Level Assignments (QALAS) were not approved by the DOE Waste Management Project Office (WMPO) prior to commencement of Metals Barrier Testing by San Diego State University and the University of Minnesota.

A QA audit (87-6 and 87-7) of the USGS facilities in Denver, Colorado, Menlo Park, California, and Carson City, Nevada, was conducted during the period of August 10-21, 1987. The NRC was not represented on this audit. I have not received a report on this audit yet but I understand that the NNWSI QA organization is encouraged by the progress the USGS has made.

QA audit 87-9 was conducted at the Fenix and Scisson facilities in Tulsa, Oklahoma, during the week of July 13, 1987. The audit report is enclosed.

B. The "Stop Work Order" status has not changed since my last report. Both the Lawrence Livermore National Laboratory and the USGS still have outstanding QALAS. A handout detailing the status of these two organizations is enclosed.

C. In discussions with Mr. Carl P. Gertz, the new WMPO Director, Mr. Gertz has assured me that the achievement of a QA program that surpasses the minimum requirements of the regulations is at the top of his list of goals.

RECOMMENDATION: That the NRC Division of High-Level Waste Management participate, as observers, at all NNWSI QA audits or major participants (SAIC, SNL, LANL, LLNL, USGS).

II. GEOLOGY-HYDROLOGY

A. On July 8 and 9, an Appendix 7 Visit was held at the USGS Denver offices on the hydrology of the Yucca Mountain site. Mr. William Ford and I represented the NRC and Dr. Martin Mifflin of Mifflin Associates, a contractor to the State of Nevada, represented the State.

Since this was Mr. Ford's first interaction with the NNWSI, the USGS personnel presented an overview of the work being done for the NNWSI. Included in the presentation was a discussion of the history of the hydrologic investigations at the site as well as a presentation of the work being accomplished now and plans for future work.

The presentations and discussions that grew out of the presentations successfully brought Mr. Ford up-to-date on the NNWSI hydrology program. However, discussions on particular parts of the program, methodologies and data sets were limited. We should plan another visit for the near future to discuss those aspects of the NNWSI hydrology program that are of particular interest to the NRC staff.

RECOMMENDATION: To plan another visit to the USGS hydrology group early in FY 88 and to plan Appendix 7 interactions at least every 6 months in the future.

B. Mr. Russ Purcell, geological consultant to the HLTR Branch (through LLNL) worked at the Nevada Test Site on August 5, 6, and 7. Mr. Purcell was conducting geomorphology and erosion studies at the exploratory shaft site. This work is ongoing.

During the week of August 17 Mr. Purcell worked in Crater Flat, just west of Yucca Mountain, with Dr. Fred Peterson, University of Nevada, Reno, conducting soils studies. Dr. Peterson is a consultant to the State of Nevada.

Mr. Purcell's letter report on these activities has been sent to LLNL for review and will be forwarded to the staff in the near future.

C. Dr. Larry McKague reviewed SCP Chapter 1 and the seismo-tectonic portions of Chapter 8 in my office on August 26, 27 and 28, 1987. Dr. McKague is preparing a letter report for Ms. Charlotte Abrams, HLTR Branch.

III. GEOCHEMISTRY

During the July TPO-WMPD Program Manager meeting, Roger D. Aines and Carol J. Bruton, LLNL, gave a presentation titled "Application of EQ3/6 to the Formulation of a Release Model for Glass Waste Forms." The presentation handout is enclosed.

The following is the outline of the presentation (from the handout):

- Background and plans for the use of EQ3/6 in waste release and package environment modeling (Aines);
- Example of the use of EQ3/6 in modeling solution compositions in contact with degrading waste glass (Bruton);
- Validation of release models which utilize EQ3/6 calculations (Aines).

Sources of input to the glass model include:

- Fundamental geochemical principles and data;
- Laboratory experiments;
- Natural systems behavior.

Glass release modeling goals include:

- To develop a model for solution compositions exiting a waste package that includes the effects of glass breakdown, precipitation of solids and interactions with the container/pour canister;
- To ascertain that the required data to run the model is available and appropriate;

- To validate the model and data using natural analogues, laboratory experiments and peer review.

Reasons for using a geochemical code include:

- Extrapolations of laboratory data are hard to make accurate beyond the timescale of the experiment;
- Long term models require use of reliable, widely accepted input (i.e., thermo-dynamic data);
- Waste systems are extraordinarily complicated; geochemical modeling allows us to address that complexity, including variations of chemistry, time and temperature;
- Geochemical code use allows the easy examination of a wide range of conditions, even those that aren't experimentally accessible.

Anticipated results, to determine the:

- Water chemistry in contact with the glass waste form as a function of the amount of dissolved glass;
- Concentration and speciation of radionuclides in the effluent water as a function of the amount of dissolved glass;
- Identity of solids controlling water chemistry, and the ability of solids to sequester radionuclides.

Consider EQ6 results as a:

- Means of understanding and interpreting the complex interplay of processes accompanying waste form dissolution;
- Initial step in modeling the geochemical evolution of the waste package system;
- Opportunity to evaluate the impact of various scenarios and experimentally inaccessible conditions on the waste package system.

The following is from the handout:

"Validation---Validation will show that the combination of a conceptual model of the system, with the EQ3/6 code and relevant data base, can be used to correctly predict what will happen in the repository.

"Geochemical modeling is predicated upon the laws of thermodynamics, and the availability of established thermodynamic data. Release calculations are based on a conceptual model of release mechanisms derived from experimental work. These are combined in a release model, and must be validated together to demonstrate that the model gives the correct answer.

"Individual aspects of the model may also be validated separately, for instance, Pu speciation in natural waters. These specific validation exercises add confidence in the overall validation, but are not adequate by themselves.

"How does validation occur?---In each validation step, a specific parameter or set of parameters is identified for prediction by the EQ3/6-based model.

"Other aspects of the system not to be predicted must be very well understood, (e.g., temperature, hydrology, initial chemistries).

"A peer-reviewed validation plan, including predicted values and allowable ranges, is prepared before any validation work is conducted.

"Stages in validation of a release model:

- Data must be shown to be appropriate, complete, and accurate.
- Model must accurately match laboratory experiments; this is extensively addressed during model development.
- Model must accurately predict the results of validation exercises which were not part of the creation of the model."

For more information on this presentation, the handout should be consulted.

IV. ROCK MECHANICS, FACILITY DESIGN, EXPLORATORY SHAFT

OCRWM has approved expanded drifting in lieu of horizontal drilling in the exploratory shaft at the NNWSI. However, full sized drifting was disapproved. Only a certain percentage of the 3 long drifts proposed will be mined to full repository size.

Fenix and Scisson began design activities the first of August at the F & S Tulsa facility.

V. WASTE PACKAGE

During August 19-20 an Appendix 7 Visit was held at Lawrence Livermore National Laboratory (LLNL). The purpose of the interaction was to update the NRC technical staff on topics in the NNWSI waste package metals barrier area.

The following topics were discussed:

- Waste package environment;
- Gamma radiation studies;
- Alloy selection process;
- Models to predict metal performance;
- Data to be used in the selection process;
- Metal microstructures;
- Intergranular SCC model;
- Electrochemically-based models;
- Contained fabrication and closure.

Present for the NRC were Mr. Tom Jungling, HLTR Branch, Dr. Michael McNeil, Office of Research, Dr. Emmy Booy, Office of Research, and myself. Dr. Peter Spiegler and Dr. Tom Devine, University of California, Berkeley, represented the State of Nevada. Dr. Virginia Oversby chaired the discussions for LLNL.

Attached is a draft trip report prepared by Mr. Jungling that discusses the topics covered by the LLNL scientists. Also attached is a list of participants.

As in the case of the hydrology Appendix 7 Visit to the USGS, these discussions were more formal than is desirable. However, as in the USGS Appendix 7 Visit, the formality was caused by the length of time since the last NRC visit to LLNL in July, 1985.

It has become more and more evident that if discussions between the NRC and NNWSI technical staffs are going to be as fruitful as they should be, such interactions should take place at much closer intervals. I suggest that discussions should take place, either formally or informally, at least every six months. Only in the areas of geology (excluding tectonics) and engineering have we come close.

RECOMMENDATION: That the NRC staff, in each technical area, have discussions with the NNWSI technical staff, either formally (workshops) or informally (Appendix 7), at least every 6 months.

VI. PERFORMANCE ASSESSMENT-ALLOCATION

Nothing to Report.

VII. ENVIRONMENT

Nothing to Report.

VIII. LICENSING AND NRC-DOE INTERACTIONS

A. Interactions held:

1. USGS Appendix 7, Hydrology, July 8-9, 1987
2. LLNL Appendix 7, Waste Package, August 19-20, 1987

B. Interactions planned:

1. NNWSI, meeting, SCP-seismo-tectonics, September 22-23, 1987
2. Appendix 7, exploratory shaft, September 22-24, 1987.

IX. STATE INTERACTIONS

A. During the week of August 17, 1987, Mr. Russ Purcell, consultant (surface geology, geomorphology) to the NRC staff worked with Dr. Fred Peterson, Professor, University of Nevada, Reno, a consultant to the State of Nevada, conducting soils studies in Crater Flat, just west of Yucca Mountain.

Mr. Purcell has written a letter report for Ms. Charlotte Abrams, HLTR Branch.

B. State of Nevada personnel and/or contractors participated in the Appendix 7 hydrology visit to the USGS and to the Appendix 7 waste package visit to LLNL. The State also participated in the ACRS visit to the NNWSI on July 29 and 30, 1987.

X. MISCELLANEOUS

A. I received a draft copy of Chapter 8 of the SCP on August 26, 1987. I now have a full draft copy (Chapter 1 through 8) of the SCP in my office.

B. On the afternoon of August 21, I was visited by Mr. Dan Berkovitz, Mr. Tim Smith, and Ms. Janet Gorn. Mr. Berkovitz is on the staff of Senator Burdick, Chairman, Committee on the Environment and Public Works; Mr. Smith is on the staff of Senator Breaux, Chairman, Subcommittee on Nuclear Regulation; and Ms. Gorn is on the Commission staff, Office of Governmental and Public Affairs/Congressional Affairs.

Mr. Berkovitz and Mr. Smith had visited BWIP and spent several days with the NNWSI and State of Nevada. They had toured the Nevada Test Site and had been briefed by WMPO and State and City of Las Vegas representatives.

These gentlemen were primarily interested in whether or not the interactions between the NNWSI and the NRC staff were satisfactory. Both Mr. Berkovitz and Mr. Smith seemed pleased with the briefings they had received and the tour of the Test Site.

C. On July 20, 1987, I attended a licensing briefing given by Don Vieth and Jerry Szymanski, WMPO; Mike Glora and R. L. Gotchy, SAIC; and L. Brenner, consultant, an administrative law judge.

The following was the purpose of the briefing as presented by Dr. Vieth:

"The objective of this licensing briefing is to continue to reinforce the commitment of NNWSI project participants to preparing and defending the license application through:

- Understanding the administrative/legal aspects of the NRC hearing process and the applicant's status in that process;
- Understanding how site characterization (pre-license application) activities will affect the applicant's case;
- Understand the critical importance of "Quality Assurance" to the project and to the individual researcher;
- Beginning to understand what the project must be doing now to develop a basis for defending the license application."

The approach to the briefing was:

- "Provide a brief review of the repository licensing process;
- What is the arena in which the contest will occur;
- Briefly review NRC hearing procedures from the

- administrative law perspective;
- Technical vs legal perspectives;
- What is expected of the expert witness;
- Emphasize how quality assurance can/will affect licensing;
- Discuss the current status of the project relative to defending the arguments for issue resolution presented in the license application.

This briefing was given to each of the participant organizations. Enclosed are the handouts.

RECOMMENDATION: The staff should carefully review this briefing package. This indicates the direction the NNWSI is going in preparing to defend the license application. If the staff has any problems with this approach, now is the time for guidance.

D. Mr. Carl P. Gertz has been confirmed as Director, Waste Management Project Office (WMPD). Mr. Gertz's first full day on the job was August 25, 1987.

Mr. Gertz came to the NNWSI from Idaho where he was manager of the Special Isotope Separation Project Office. Mr. Gertz has a Civil Engineering degree from Michigan State University and a Master's degree in Systems Management from the University of Southern California.

I believe that the transition to the new management will be smooth. Mr. Gertz indicated that there would be no major shake-ups in the NNWSI.

E. SAIC is now the "Integrating Contractor" to the NNWSI. Major contract requirements include (from the handout):

- NNWSI Project Integration
- Project Management Support
- Technical Support

The NNWSI project integration role includes:

- Responsible for the management and integration activities performed by NNWSI project participants;
- Assistance to WMPD in planning, justifying, budgeting, scheduling, reviewing and evaluating the activities executed by the NNWSI participants;
- Organizationally independent;
- Sensitive to participants' needs.

A handout is enclosed.

F. Enclosed is a handout showing the status of study plans as of July 28, 1987. Highlights are:

- 106 study plans - each linked to one SCP study.
- There are 5 exploratory shaft study plans:
 - SNL excavation investigations
 - USGS percolation studies
 - USGS overcore stress studies
 - USGS shaft mapping
 - Los Alamos H₂O movement - tracer tests (Cl, Cl⁶)
- Study plan preparation and review is quality level 2 activity.
- 26 weeks for NRC review.

cc: With enclosures:

J. J. Linehan
K. Stablein
S. Wastler

cc: No enclosures:

C. P. Gertz	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:

WMPD QA SDRs resulting from Audit 87-9, F & S Support of the NNWSI Project (WMPD Action Item #87-2231); WMPD QA SDRs resulting from supplemental QA Audit S-87-1 of LLNL of the NNWSI Project; WMPD QA Audit 87-3 of LLNL support of NNWSI Project (WMPD Action Item #87-2247); WMPD QA Audit 87-4 of SAIC/T&MSS support of the NNWSI Project (WMPD Action Item #87-2264; WMPD QA Audit 87-6/87-7 of USGS support of the NNWSI Project; WMPD QA Audit 87-9 of F&S support of the NNWSI Project (WMPD Action Item #87-2382); WMPD QA Audit 86-2 of USGS support of the NNWSI Project; Stop Work Order Status; Application of EQ3/6 to the Formulation of a Release Model for Glass Waste Forms (R. D. Aines & C. J. Bruton); Trip Report (LLNL, 8/19-20-87); Technical Data Base Status July 1987 (SNL); Presentation to PM/TPD Meeting - Role of the Integrating Contractor (Technical & Management Support Services; Study Plans Status; NNWSI Project Licensing Briefings; Review of the High Level Waste Repository Licensing Process, M.A. Glora; The NRC License Application Review and Hearing Procedures (R. L. Gotchy); NRC Hearings and You (L. Brenner); Role and Impact of QA in Licensing Hearings - Case Studies (R. Gotchy & L. Brenner); Building the Licensing Case, (J. S. Szymanski); 2 NNWSI Project Licensing Briefings - (Larry Brenner) & (Gotchy & Brenner)



Department of Energy

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AUG 07 1987

Larry R. Hayes
Technical Project Officer
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WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) AUDIT 87-6/87-7 OF UNITED STATES GEOLOGICAL SURVEY (USGS) 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 USGS QA Program Plan and quality related activities on August 10-21, 1987. Current plans call for the audit to encompass the activities of your Denver, Menlo Park, and Carson City facilities. Please arrange a preaudit conference for the appropriate personnel at your Denver facility beginning at 10 a.m. on August 10, 1987. Current plans call for members of the audit team to visit the Carson City facility August 18, 1987, and the Menlo Park facility on August 19, 1987. The postaudit conference is tentatively scheduled for 10 a.m. August 21, 1987; also in Denver.

The audit will encompass, but not be limited to, the following areas:

- QA Program - all sections
- WBS Elements -
 - 1.2.3.2.1 Geological Investigations
 - 1.2.3.2.2 Seismic Investigations
 - 1.2.3.2.3 Site Stability
 - 1.2.3.3.1 Stream Flow
 - 1.2.3.3.2 Saturated Zone Hydrology
 - 1.2.3.3.3. Unsaturated Zone Monitoring
 - 1.2.3.3.5 Paleohydrology
 - 1.2.6.9 Testing

The team will consist of:

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



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AUG 11 1987

Richard L. Bullock
Technical Project Officer
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WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) STANDARD
DEFICIENCY REPORTS (SDRs) RESULTING FROM AUDIT 87-9 OF FENIX & SCISSON (F&S)
SUPPORT OF THE NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS (NNWSI) PROJECT
(WMPO ACTION ITEM #87-2231)

Enclosed are four SDRs (Nos. 058-061) which were generated as the result of the
WMPO QA Audit 87-9 of the F&S NNWSI Project QA Program Plan and implementing
procedures.

Please note that you are required to provide responses to each SDR by
completing blocks 14 through 18, as appropriate, on the first page of each SDR.
Be advised that audit checklist references, when noted on the SDRs, are for
WMPO internal use and should have no bearing on your response to the cited
deficiencies.

Your responses to these SDRs are due back to the WMPO in 20 working days from
the date of this letter. You are requested to provide an additional copy of
each SDR response to Nita J. Brogan, Science Applications International
Corporations, Las Vegas, Nevada.

If you have any questions, please contact me at 295-1125.

A handwritten signature in cursive script, reading "James Blaylock".

James Blaylock
Project Quality Manager
Waste Management Project Office

WMPO:JB-2521

Enclosures:
Standard Deficiency Reports

8712090302

N-QA-036
3/87

WMPO STANDARD DEFICIENCY REPORT

Completed by Originating QA Organization	1 Date 7/17/87		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 87-9		3a Identified By G. Heaney		3b Branch Chief Concurrence Date N/A
	4 SDR No. 058		Rev. 0		
	5 Organization Fenix & Scisson, Inc.		6 Person(s) Contacted S. Murphy		7 Response Due Date is 20 Working Days from Date of Transmittal
Completed by Originating QA Organization	8 Requirement (Audit Checklist Reference, if Applicable) Checklist 87-9-2, Item T-10 NNWSI SOP-03-01; "Engineering, Construction and Support Service at the NTS," Rev. 0, Paragraph 5.3.1 states in part, "The work order scope shall include reference to the Technical and Quality requirements of the criteria letter (cont'd)"				
	9 Deficiency Contrary to the above, F&S Procedure PP-40-03, "Procedure for Making and Issuing Work Orders for NNWSI Projects at NTS" does not contain this requirement.				
	10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1) Revise PP-40-03 to include requirements contained in Block 8. 2) Instruct appropriate personnel to revised procedural requirements. 3) Determine if omission of the requirement from the procedures has impacted (cont'd)				
Aprvl.	11 QAE/Lead Auditor Date 7-30-87 R.H. Klemens		12 Branch Manager Date 7-30-87 W.R. Kagan		13 Project Quality Mgr. Date 7/30/87 James Blaylock
	14 Remedial/Investigative Action(s)				
Completed by Organization in Block 5	15 Effective Date _____				
	16 Cause of the Condition & Corrective Action to Prevent Recurrence				
	17 Effective Date _____				
Comp. by Orig. QA Org.	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



**WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

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Requirement (cont'd)

or work request."

Recommended Action (cont'd)

any Quality Assurance Level I or II work requested on previously generated work orders.

WMPO STANDARD DEFICIENCY REPORT

N-0A-038
3/87

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

1 Date 7/17/87		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 87-9		3a Identified By W. Marchand		3b Branch Chief Concurrence Date N/A	
4 SDR No. 059		Rev. 0			
5 Organization Fenix & Scisson, Inc.		6 Person(s) Contacted M. Regenda		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) Checklist No. 87-9-1, Item 2.0-1b, B NNWSI SOP-02-01, Rev. 0, Paragraph 5.1.1, states in part, "Activities that affect quality shall be prescribed by documented instructions and procedures of a type appropriate to the circumstances and shall be accomplished in accordance (cont'd)					
9 Deficiency Contrary to the above, F&S Quality Assurance Procedure QAP-2.2(N), "Indoctrination and Training of Quality Assurance Personnel," Rev. 1, does not describe the training required for Quality Assurance personnel performing surveillances (cont'd)					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1) Revise QAP 2.2(N) to include specific training requirements for QA surveillance personnel. Train QA surveillance personnel to the requirements to be included in the revision of QAP-2.2(N).					
11 QAE/Lead Auditor Date <i>R.H. Klemens</i> 7/24/87		12 Branch Manager Date <i>W. Marchand</i> 7/24/87		13 Project Quality Mgr. Date <i>James Blaylock</i> 7/30/87	
14 Remedial/Investigative Action(s)					
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		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	



**WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

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Requirement (cont'd)

with these instructions and procedures.

Deficiency (cont'd)

NOTE: The procedure does describe education and experience requirements as well as physical requirements for the position.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

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

1 Date 7/15/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During Audit 87-9		3a Identified By F. Ruth		3b Branch Chief Concurrence Date N/A	
5 Organization Fenix & Scisson, Inc.		6 Person(s) Contacted D. Tunney		4 SDR No. 060 Rev. 0	
7 Response Due Date is 20 Working Days from Date of Transmittal					
8 Requirement (Audit Checklist Reference, if Applicable) Checklist 87-9 - Item No. 15.0-2, Page 16 of 36 QAPP-002, Rev. 1, Para. 15.1 and QAP-15.2(N), Rev. 1, Para. 5.4 (cont'd)					
9 Deficiency 1) The QAPP and the QAP do not give enough detail as to the application and removal of the Discrepant Item Tag. 2) There is no exhibit of the (cont'd)					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1) Revise QAP-15.2(N) to describe the application and removal of the Discrepant Item Tag. (cont'd)					
11 QAE/Lead Auditor Date 7-30-87 R. H. Klemm		12 Branch Manager Date 7-30-87 W. R. Kray		13 Project Quality Mgr. Date 7/30/87 James Blaylock	
14 Remedial/Investigative Action(s)					
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 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 Veri- fication <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	



**WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

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Requirement (cont'd)

identify the use of a Discrepant Item Tag (DIT) to be attached to nonconforming items which will be segregated pending disposition of the nonconformance.

Deficiency (cont'd)

DIT in the procedure. 3) QAP-15.2(N), Rev. 1, Para. 5.4 identifies the DIT as form LV-192A but in fact that is the Nonconformance Report.

Recommended Action (cont'd)

- 2) Place an exhibit of the Discrepant Item Tag at the back of the procedure.
- 3) Change QAP-15.2(N), Rev. 1, Para. 5.4 to properly identify the form number of the Discrepant Item Tag.

N-QA-038
3/87

N-QA-038
3/87

WMPO STANDARD DEFICIENCY REPORT		N-QA-038 3/87	
1 Date 7/17/87		2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 Page 1 of 2	
3 Discovered During WMPO Audit 87-9		3a Identified By B. Klemens	
		3b Branch Chief Concurrence Date N/A	
4 SDR No. 061		Rev. 0	
5 Organization Fenix & Scisson, Inc.		6 Person(s) Contacted B. Graves, R. Bullock, P. Bolling	
		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) QAP-17-1, Rev. 0, Para. 4.0, and TESOP-004-02, Rev. 0, Para. 7.0, require NNWSI QA Records to be indexed into the QARMS database.			
9 Deficiency Contrary to the above, F&S Personnel Qualification (Certification) Records are retained by their Personnel Department and not turned over to Central Files for indexing into the QARMS database.			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective 1) Comply with above requirements. As an alternative, F&S could provide Central Files with a certificate stating that the individual has been certified but due to circumstances the backup records are filed in the (cont'd)			
11 QAE/Lead Auditor Date R.H. Klemens 7/30/87		12 Branch Manager Date J.M. Kagan 7/30/87	
		13 Project Quality Mgr. Date James Blumlock 7/30/87	
14 Remedial/Investigative Action(s)			
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	



WMPO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

N-QA-038
10/86

SDR No. 061

Rev.

Page 2 of 2

Recommended Action (cont'd)

personnel office.

2. Revise QAP-17-1 and TESOP-004-03 accordingly to reflect action taken.



Department of Energy

Nevada Operations Office

P. O. Box 98518

Las Vegas, NV 89193-8518

AUG 03 1987

Lawrence D. Ramspott
Technical Project Officer for NNWSI
Lawrence Livermore National Laboratory
Mail Stop L-204
P.O. Box 808
Livermore, CA 94550

WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) STANDARD
DEFICIENCY REPORTS (SDRS) RESULTING FROM SUPPLEMENTAL QA AUDIT S-87-1 OF
LAWRENCE LIVERMORE NATIONAL LABORATORY (LLNL) OF THE NEVADA NUCLEAR WASTE
STORAGE INVESTIGATIONS (NNWSI) PROJECT

Enclosed are three SDRs (Nos. 035, 036, and 038) which were generated as a result of the supplemental audit on Well J-13 water traceability. Please note that you are required to provide responses to each SDR by completing blocks 14 through 18 as appropriate on the first page of each SDR. Responses are due back to this office 20 working days from the date of this letter. Please return the original SDRs to me, and concurrently send a copy of each SDR response to Juanita J. Brogan of SAIC, Las Vegas, Nevada.

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

James Blaylock

James Blaylock
Project Quality Manager
Waste Management Project Office

WMPO:JB-2450

Enclosure:
As stated

cc w/ encl:

V. J. Cassella, HQ (RW-222) FORS
J. P. Knight, HQ (RW-24) FORS
J. J. Dronkers, LLNL, Livermore, CA
L. B. Ballow, LLNL, Livermore, CA
S. H. Klein, SAIC, Las Vegas, NV
J. W. Estella, SAIC, Las Vegas, NV
C. M. Thompson, SAIC, Las Vegas, NV
G. D. Dymmel, SAIC, Las Vegas, NV
J. J. Brogan, SAIC, Las Vegas, NV
W. R. Kazor, SAIC, Las Vegas, NV
P. T. Prestholt, NRC, Las Vegas, NV
F. L. Ramirez, SAN
R. W. Gray, MED, NV
J. R. Rinaldi, QAD, NV
M. D. Valentine, WMPO, NV
L. P. Skousen, WMPO, NV
H. P. Kunich, WMPO, NV

WMPO STANDARD DEFICIENCY REPORT

N-0A-01
3/87

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

1 Date 6/18/87		2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During NTS-4/21/87 * Audit S-87-1-6/18/87		3a Identified By W. Kazor G. Dymmel		3b Branch Chief Concurrence Date N/A	
4 SDR No 035		Rev			
5 Organization LLNL		6 Person(s) Contacted F. Huckabee, NTSO D. Peifer, LLNL, J. Truelson, LLNL/HV		7 Response Due Date 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference if Applicable) SOP-03-01 Rev. 0 Entitled "NNWSI Engineering Construction and Support Services at the NTS" dated 9/28/84 requires NTSO approval for tendered services at NTS.					
9 Deficiency Contrary to above, water from the J-13 well was obtained by LLNL without NTSO approval.					
10 Recommended Action(s) <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective LLNL to review requirements of SOP-03-01 and insure that cognizant personnel are sufficiently trained in NTS requirements. Comply with SOP-03-01 for future NNWSI services at NTS.					
11 QAE/Lead Auditor Date <i>W.R. Kazor</i> 6/30/87		12 Branch Manager Date <i>W.R. Kazor</i> 6/30/87		13 Project Quality Mgr. Date <i>James Blaylock</i> 6/30/87	
14 Remedial/Investigative Action(s)					
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 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 Verification <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date		Branch Manager/Date	
22 Remarks					
*See Page 2					
QA CLOSURE		QAE Lead Auditor Date		Branch Manager Date	
				PDW Date	

CONTINUATION SHEET FOR SDR NO. 035

ITEM 3. (continued)

This deficiency was first discussed on April 16, 1987 at a meeting at DOE/WMPD Las Vegas, NV. Attendees at the meeting included M. Blanchard, J. Blaylock, D. Livingston, G. Dymmel, S. Metta, and W. Kazor. The problem involved the procurement of J-13 water by LLNL from NTS without proper NNWSI interface with NTSO in accordance with SOP-03-01 Rev. 0.

A telecon between W. Kazor and F. Huckabee of NTSO resulted in an invitation to visit the NTS and to discuss the matter further. Accordingly, a visit to NTS was made by W. Kazor and G. Dymmel on April 21, 1987 for discussions with F. Huckabee. This visit substantiated the fact that LLNL had procured J-13 water through their Site Manager, J. Truelson without utilizing NNWSI procedures.

Subsequent discussions with J. Blaylock and J. Dronkers of LLNL resulted in supplemental audit S-87-1 at LLNL where discussions with D. Peifer corroborated the problem.

WMPO STANDARD DEFICIENCY REPORT

N-04-03
8/87

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

1 Date 6/18/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During Audit S-87-1		3a Identified By W. R. Kazor		3b Branch Chief Concurrence Date N/A	
4 SDR No. 036		Rev.			
5 Organization LLNL		6 Person(s) Contacted Dr. R. Van Konynenburg		7 Response Due Date: 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference if Applicable) SOP-02-01 Rev. (3-1-85) requires that all Quality Assurance Level Assignments (QALAS) be approved by WMPO prior to start of work.					
9 Deficiency Contrary to the above, although QALA E-20-6 for Metals Barrier Testing (WBS #2.2.3.2) was disapproved by WMPO on 11/18/85, LLNL issued P.O. No. 8058705 dated 2/13/86 which assigned activity E-20-6 to San Diego State University. One 55 gallon drum of J-13 Water was shipped to San Diego State via shipping document (cont'd)					
10 Recommended Action(s) <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input type="checkbox"/> Corrective LLNL to: 1) determine root cause of deficiency and take appropriate action to preclude recurrence; 2) initiate action to determine validity of data; 3) insure PI/QA review of all future P.O.s and shipping documents; 4) Prepare appropriate (cont'd)					
11 QAE/Lead Auditor Date <i>W.R. Kazor 7/1/87</i>		12 Branch Manager Date <i>W.R. Kazor 7/1/87</i>		13 Project Quality Mgr. Date <i>James Blaylock 7/1/87</i>	
14 Remedial/Investigative Action(s)				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 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 Verification <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date		Branch Manager/Date	
22 Remarks					
23 CLOSURE		QAE Lead Auditor Date		Branch Manager Date	
24 PDM Date					



WMPO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

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10/86

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DEFICIENCY (cont'd)

L-60275. In addition, work on a Waste Package Metal Barrier activity was contracted to the University of Minnesota via P.O. #7057605 on 2/25/86. Five gallons of J-13 Water were shipped to the University of Minnesota via shipping document No. 1-60232. There was no approved QALA for this activity.

RECOMMENDED ACTION (cont'd)

QALA for WMPO approval. In addition, LLNL is requested to evaluate and report on the impact of work involving J-13 Water on the NNWSI Project. This would include internal work at LLNL on Waste Package Environment, Waste Form (Spent Fuel), and Metals Barriers and work being done at off site locations such as Ohio State University, HEDL, and PNL.

H-DA-038
3/87

3187

WMPO STANDARD DEFICIENCY REPORT		N-DA-038 3/87	
1 Date 6/18/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 Page 1 of 2	
3 Discovered During Audit S-87-1		3a Identified By F. Ramirez, W. Kazor M. Valentine	
		3b Branch Chief Concurrence Date N/A	
4 SDR No 038		Rev	
5 Organization LLNL		6 Person(s) Contacted D. Peifer	
7 Response Due Date is 20 Working Days from Date of Transmittal			
8 Requirement (Audit Checklist Reference, if Applicable) SOP-02-01, Rev. Sec. 8.0; 8.3. Verify that items requiring calibration are tagged labeled in accordance with written procedures which show the dates of calibration and recall and the identity of the person/organization who performed the calibration.			
9 Deficiency Field Test pH meter had an expired calibration label dated 1/27/78 with next calibration due date for 7/27/78. Approved procedure to ensure timely calibration of pH meter/thermometer was not in evidence.			
10 Recommended Action(s): <input type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input type="checkbox"/> Corrective			
1) Implement procedure for calibration of M & T.E.			
2) Calibrate subject instrument.			
3) Determine what test/measurements were made on NNWSI work and (cont'd)			
11 GAE/Lead Auditor Date 6/30/87		12 Branch Manager Date 6/30/87	
13 Project Quality Mgr. Date 7/1/87			
14 Remedial/Investigative Action(s)			
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 Response <input type="checkbox"/> Reject		GAE/Lead Auditor/Date	
20 Amended Response <input type="checkbox"/> Accept <input type="checkbox"/> Reject		Branch Manager/Date	
21 Verification <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		GAE/Lead Auditor/Date	
		Branch Manager/Date	
22 Remarks			
23 GAE/Lead Auditor/Date		Branch Manager/Date	
24 CLOSURE		POW Date	



**WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

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SDR No 038

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RECOMMENDED ACTION (cont'd)

validity of results.

- 4) Determine cause and implement measures to prevent recurrence.



Department of Energy

Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

AUG 13 1987

Lawrence D. Ramspott
Technical Project Officer for NNWSI
Lawrence Livermore National Laboratory
Mail Stop I-204
P.O. Box 808
Livermore, CA 94550

WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) AUDIT 87-3 OF LAWRENCE LIVERMORE NATIONAL LABORATORY (LLNL) SUPPORT OF THE NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS (NNWSI) PROJECT (WMPO ACTION ITEM #87-2247)

Enclosed is the report of QA Audit 87-3, which was conducted for the WMPO at LLNL April 27 through May 1, 1987.

The audit reviewed sufficient objective evidence related to the LLNL Quality Assurance Program (QAPP) to confirm that the LLNL Program is in compliance with the NNWSI Project Quality Assurance Plan NVO-196-17, Revision 4, except in the areas cited. Deficiencies are described in Section 6.0 of this report.

During the course of the audit, the audit team generated five Standard Deficiency Reports (SDRs) (Nos. 020-024), ten observations, and five recommendations. The action copies of the SDRs were transmitted to you by WMPO letter JB-1797 on May 20, 1987. Copies of these SDRs are also enclosed with this audit report for your information.

Written responses to the ten observations contained within this report are required. These responses are due within 20 working days of the transmittal date of this report. Please address your responses to me and concurrently send a copy of each observation response to Nita J. Brogan, Science Applications International Corporation (SAIC), Las Vegas, Nevada.

The six recommendations contained in this audit report are submitted for your staff's consideration during the implementations of your QAPP and technical activities in support of the NNWSI Project.

By copy of this letter the audit is considered closed. Any open SDRs or observations will continue to be tracked until each is closed.

WMPO QUALITY ASSURANCE AUDIT REPORT
NNWSI PROJECT AUDIT OF LAWRENCE LIVERMORE NATIONAL LABORATORY

AUDIT NUMBER: 87-3

CONDUCTED ON: 4/27/87 - 5/1/87

PREPARED BY

C. M. Thompson
C. M. Thompson - Lead Auditor

DATE

7/30/87

APPROVED BY

James Blaylock
James Blaylock - PQM (WMPO)

DATE

7/31/87

1.0 INTRODUCTION

This report contains the results of the Quality Assurance Audit of Lawrence Livermore National Laboratory (LLNL), Livermore, California. The audit was conducted April 27 through May 1, 1987, in accordance with the WMPD Quality Assurance Program Plan (NVO-196-18) and Quality Management Procedure (QMP) 18-01, Rev. 1.

2.0 AUDIT SCOPE

The purpose of the audit was to evaluate the effectiveness of the LLNL Quality Assurance (QA) Program with respect to the requirements of NNWSI Project NVO-196-17, Rev. 4, and to verify the implementation of the QA Program as it relates to activities on the NNWSI Project.

3.0 AUDIT TEAM PERSONNEL

The audit team consisted of the following members:

Lead Auditor: C. M. Thompson, SAIC, Las Vegas

Auditors:	H. H. Caldwell	Auditor	SAIC, Las Vegas
	W. R. Kazor	Auditor	SAIC, Las Vegas
	J. M. Gromer	Auditor	SAIC, Las Vegas
	F. D. Peters	Auditor	SAIC, Las Vegas
	Gerard Heaney	Auditor	SAIC, Las Vegas
	S. R. Mattson	Technical Specialist	SAIC, Las Vegas
	U. Sun Park	Technical Specialist	SAIC, Las Vegas
	G. D. Dymmel	Technical Specialist	SAIC, Las Vegas
	D. C. Newton	Auditor	DOE/HQ

4.0 SUMMARY OF AUDIT RESULTS

Evaluation of the Lawrence Livermore National Laboratory QA Program and selected technical activities indicates general compliance with NNWSI Project NVO-196-17, Rev. 4 requirements. Five deficiencies were identified during the course of the audit. The deficiencies which were identified by the audit team were not concentrated in any one specific area. The audit team also generated ten observations and five recommendations for the LLNL staff to consider. The deficiencies, observations, and recommendations are delineated in Section 6.0 of this audit report.

4.1 PROGRAMMATIC

To the extent audited, the audit team determined that the following program elements of the LLNL QA Program were in compliance with NNWSI Project QA Program requirements:

1. Organization
2. Quality Assurance Program
3. Design Control
4. Procurement Document Control
5. Instructions, Procedures and Drawings
6. Document Control
- * 7. Control of Purchased Material, Equipment, and Services
11. Test Control
- *12. Control of Measuring and Test Equipment
13. Handling, Storage and Shipping
16. Corrective Action

*Note: Findings in these areas remain open from WMPD Audit No. 86-1 conducted in February 1986.

Program elements not audited at this time were:

9. Control of Special Processes
14. Inspection, Test, and Operating Status

Elements 9 and 14 do not presently apply to LLNL NNWSI Project activities.

Program elements which the audit team identified as being deficient were:

8. Identification and Control of Items
10. Inspection (Surveillance requirements only)
15. Nonconforming Materials, Parts or Components
17. Quality Assurance Records
18. Audits

The deficiencies were qualified by the application of severity levels that are based on the significance of the finding. There are three severity levels which are used. Severity Level 1 is the most severe and is applied to significant deficiencies considered of major importance. These deficiencies require remedial, investigative, and corrective actions to prevent recurrence. Severity Level 2 deficiencies are not of major importance but may also require remedial, investigative, and/or corrective actions. Severity Level 3 is applied to a minor deficiency which only requires remedial action. These deficiencies are generally isolated cases or have a very limited scope. The five Standard Deficiency Reports (SDRs) identified were classified as either Severity Level 2 or 3.

Seven of the 10 observations identified during the audit were programmatic in nature. The observations identify conditions that are presently not violations of procedural requirements but in the opinion of the audit team, could lead to violation of requirements in the future. The observations were in the programmatic areas of training, document control, inspection/surveillance, nonconformances, and records management.

Three of the six recommendations were in the programmatic areas of inspection/surveillance, test control, and nonconformances.

4.2 TECHNICAL

The audit team also audited LLNL's implementation of the following specific technical activities:

1. Geochemical Modeling Code EQ3/6
2. Waste Form Testing
3. Design, Fabrication, and Prototype Testing

Review of the LLNL activities on the Geochemical Modeling Code EQ3/6 indicated that work was still in the preliminary stages. No deficiencies were identified, however there were three observations identified in this area which should be addressed prior to the application of the EQ3/6 Code. This may preclude potential violations and delays in the future. There were also three recommendations in this area. Review of the LLNL activities in the area of Waste Form Testing indicated that the actual laboratory work has been subcontracted to other National Laboratories, specifically the Argonne National Laboratory (ANL) and the Hanford Engineering Development Laboratory (HEDL). This prevented the actual observation of any tests or experiments by the audit team. The review of the Design Fabrication, and Prototype Testing indicated that there was no activity in this area at this time.

5.0 AUDIT MEETINGS

5.1 PREAUDIT CONFERENCE

A preaudit conference was held on April 27, 1987, at 10:00 a.m. The purpose, scope, and agenda of the audit were reviewed with the LLNL staff and coordinators were assigned to escort audit team members during the audit. (See Enclosure A for attendees.)

5.2 PRELIMINARY POSTAUDIT CONFERENCE

A preliminary postaudit conference was held on April 29, 1987, at 10:00 a.m. Only the results of the audit of the LLNL Geochemical Modeling Code EQ3/6 were presented at this meeting. (See Enclosure B for attendees.)

5.3 POSTAUDIT CONFERENCE

A postaudit conference was held on May 1, 1987, at 10:00 a.m. Results of the balance of the audit and SDRs, observations, and recommendations identified during the course of the audit were presented to the LLNL staff. Rough draft copies of the SDRs, observations, and recommendations were presented to LLNL management personnel at this time. (See Enclosure C for attendees.)

6.0 SYNOPSIS OF SDRs/OBSERVATIONS/RECOMMENDATIONS

STANDARD DEFICIENCY REPORTS

1. LLNL does not have approved procedures for the handling, storage, shipping, or identification of rock samples and Well J-13 water. Refer to SDR No. 020 - Severity Level 2.
2. There was no surveillance plan at LLNL for FY 87; surveillance personnel were not certified, and there were some minor problems with the surveillance records. Refer to SDR No. 021 - Severity Level 2.
3. The Deputy for QA had not documented the monthly review of the Nonconformance Report (NCR) Log as required by an LLNL QA procedure. Refer to SDR No. 022 - Severity Level 3.
4. A list of personnel authorized to authenticate records has not been prepared. Refer to SDR No. 023 - Severity Level 3.
5. Annual audits of LLNL contractors have not been performed in all cases. In addition, audit findings have remained open for more than a year with no apparent follow-up. There were also some problems identified with the audit records. Refer to SDR No. 024 - Severity Level 2.

OBSERVATIONS

Observation No. 1

The user's guide and documentation consist of the main user's manual for EQ3NR, EQ6, and MCRT, and supplemental user's manual for added capabilities. Only the EQ3NR manual for version 3230 has been released. The content of the EQ3NR user's manual covers the intent of the NUREG 0856 and NNWSI-SOP-03-02, however, it lacks the details necessary for even an informed user to install and run the code without significant effort on user's part to decipher the code itself. Justifiably, the manual puts greater emphasis on the theoretical basis of the geochemical model, however, the description of the code structure itself is very skimpy considering the volume and the complexity of the code. For example:

- There is no flowchart except a very rudimentary block diagram.
- Interrelationships among submodels and all major subroutines are not clear.
- Descriptions of default values, methods of verification, accuracy, uncertainties, and error processing all need improvement.

There are reports on several added capabilities to the EQ3/6 model such as the fixed fugacity option and solid solution model, but they vary widely in contents and details and do not cover the entire range of documentation needed to fulfill the requirements of NNWSI-SOP-03-02. If the intent is to use these reports as the supplemental user's manual as indicated by LLNL personnel, then a more consistent and uniform guideline in writing these reports will be necessary.

For the baseline EQ3/6 code to be released, the main user's manual and supplements will have to be updated in order to fully comply with the requirements of the NNWSI-SOP-03-02.

Observation No. 2

The software QA program for EQ3/6 should be fully implemented before the 3245 version of EQ3/6 is peer reviewed and issued. This will ensure that all of the appropriate documentation is available for the peer review and for the 3245 users when it is issued.

As a prerequisite for this, the review and revision, if appropriate, of LLNL 033-NWMP-R 19.0, 033-NWMP-R 19.1, 033-NWMP-R 19.2 and 033-NWMP-P 19.3 through 19.12 is necessary to ensure that the EQ3/6 software QA program complies with the requirements of NNWSI-SOP-03-02.

Observation No. 3

File folders for the development of EQ3/6 codes are not sent to QA records until the file folder is closed. This may involve a considerable length of time. Secure interim storage should be provided or back up copies of such file folders should be made at appropriate intervals to ensure that the information within the folders is not lost or destroyed.

Observation No. 4

A review of the training files indicates that substantial effort has been made in preparation of a QA Orientation Manual and a QA Training Manual. A training consultant has also been employed to assist in setting up this program. To date, this program has not been implemented. This has been recognized and reported in a Management Assessment by LLNL (Reference NWM 87-90; L. Ramspott to M. Kunich, dated April 20, 1987). A schedule for the implementation of the training program should be established.

Observation No. 5

There is no way to determine the effective date of the procedures in the LLNL QAPP. Neither the procedures themselves nor the Table of Contents contain the effective date. The preparation date is used in the Table of Contents. This date may be significantly earlier than the actual effective date. It is therefore not clear when implementation should have occurred. An "effective date" should be clearly evident on the LLNL procedures. This will also prevent the inadvertent use of procedures prior to final approval.

Observation No. 6

More emphasis should be placed on surveillance than is evidenced to date. The performance of only one surveillance to date in FY-87 and the lack of plans to perform any future surveillances does not meet the intent of SOP-02-01.

The performance of surveillances to confirm that quality requirements are being implemented is an essential part of the QA program.

Observation No. 7

There is concern that the intent of the NCR process is not being realized. Eight of the nine NCRs issued to date have been assigned to the QA organization for disposition whereas only one has gone to non-QA personnel. NCR Nos. 1, 6, 8, and 9 should have been assigned to procurement or Project Management for disposition; the appropriate technical personnel should have provided the disposition for NCR Nos. 3 and 4.

The lengthy response and closeout time of NCR's is also a concern. The attention and priority given to aggressive followup of open NCR's appears to be insufficient.

- Two NCRs have been open since September 1986
- Two NCRs have been open since October 1986
- One NCR has been open since January 1987

In addition, the attention to the maintenance of the Nonconformance Status Sheets in the NCR logbook should be improved. For example:

1. Many entries are in colored ink (blue, red, and green; NV0-17 requires black ink).
2. The disposition blank is often left blank (three of the nine NCR entries examined) or marked "N/A" (five of the nine).

3. The QA verification entries of closed NCRs is inconsistent. One of the three closed NCRs was noted as closed, but there was no QA sign-off present.

Observation No. 8

It was observed that records are maintained by subcontractors, i.e., ANL, Lamont, Illinois for activities contracted by LLNL. The subcontractor is not required to transfer records to LLNL until six months after completion of the contract. However, many of the contracts are long term and some milestones have been completed resulting in a large backlog (i.e., 2 to 3 years accumulation) of records in the subcontractor's possession. Intermediate points or timely intervals for transfer of records to LLNL from the subcontractors may help to prevent this situation from becoming a serious problem in records management and future licensing activities.

Observation No. 9

Although LLNL meets the technical definition of dual storage for records, Bldg. 417 is a substandard structure for use as a records repository. The building is of sheet metal construction, exposed to the external elements, lacks climatic control, and contains inflammable liquids. The storage cabinets within the building are reported to be one-hour fire rated units. There is particular concern about the possible deterioration of the backup EQ3/6 3245 magnetic tapes due to extremes in ambient temperatures and to the possible influence of the adjacent electrical facility on the properties of the magnetic tapes.

Observation No. 10

The audit, surveillance, and NCR files have not been maintained in a logical, orderly manner. There is a concern that interim documents could get lost or destroyed before they are complete and submitted for storage.

RECOMMENDATIONS

Recommendation No. 1

The present quality level assignment on the work being performed on the development of the EQ3/6 code is Level II. It is recommended that the development of this code be upgraded to a Quality Level I for three reasons:

- The code is actually being developed at a quality level commensurate with Quality Level I activity.
- The work system that is being planned in the future on the performance of the engineered barrier and modeling of transport pathways to the accessible environment (Quality Level I activities) will require the use of the EQ3/6 code.
- The use of the EQ3/6 code will most likely be required in the total system performance assessment that cover both the anticipated and unanticipated processes and events.

Recommendation No. 2

The need for additions to the data base addition has been identified by LLNL for some time. However, no systematic compilation of the data required is evident. Ideally, the needed data base would be compared with the current data base to identify the deficiencies. This is partially done, for example, UCID-20895 (application of EQ3/6 to modeling of nuclear waste glass behavior in a tuff repository) identifies the minerals currently thought to be important for glass modeling and the data needs for the phases known or predicted to form on nuclear waste glass. For Sal Repository Project office (SRPO), this is done in a systematic way and the results are compiled in a report. A similar action is needed for the application of EQ3/6 to the NNWSI Project.

Recommendation No. 3

It is understood that LLNL is preparing a letter to the WMPD which recommends a meeting of the EQ3/6 developers and users to consider a number of common problems associated with the EQ3/6. The WMPD agrees with this recommendation, and believes that it is important to hold such a meeting particularly because some of the users are not associated with LLNL.

Some of the concerns to be discussed at such a meeting should probably be:

1. The QA level for the development of the EQ3/6 data base.
2. The methods which should be used for the selection of the individual values which are to be included in the data base.
3. The QA level for the development of the EQ3/6 codes.
4. The extent of the verification and the validation of the data base and codes which will be performed by the developers as opposed to the users.
5. The performance of peer review of the data base and the codes.

Recommendation No. 4

The following recommendations are made regarding LLNL Procedure No. 033-NWMP-P15.0, "Nonconformances."

1. The scope of LLNL Procedure No. 033-NWMP-P15.0, "Nonconformances," should be broadened to include NCRs associated with software (i.e., the publication of data and reports).
2. Time limitations for the processing of NCRs should be specified.
3. The procedure and the NCR form should be modified so that the form contains a brief statement about how the verification was performed by QA.
4. Although not within the scope of this audit, the responsibility for performing the activities specified in para. 15.0.7 should be stated along with the addressee at the Basalt Waste Isolation Project and the SRPO (The QA Manager is suggested).
5. The responsibility for submitting NCRs (para. 15.0.9) to the records center should be specified. Also, the term "supporting documents" should be explained (is the NCR log to be included?).

Recommendation No. 5

It is recommended that the following changes to LLNL Procedure No. 033-NWMP-P18.1 be considered:

1. Section 18.1.4.5, "Surveillance Report," should:
 - Specify to whom surveillance reports are to be issued
 - Identify how any adverse observations are to be processed.
 - Include a requirement that the date of the surveillance (and other pertinent information - see Section 10.2.7 of SOP-02-01) be included in the report.

Also, a requirement for timely issuance should be included and should be related to the date of the surveillance, not just the date of the meeting with the Task Leader as is presently stated.

2. The procedure should also discuss the issuance of NCRs as a result of a surveillance and how this process would be handled.

7.0 REQUIRED ACTION

A written response is required for each Standard Deficiency Report delineated in Part 6.0 above. Copies of the SDRs were forwarded by mail to the LLNL Technical Project Officer on May 20, 1987. Response was due on June 22, 1987. Upon response acceptance and satisfactory completion and verification of all remedial and corrective action, the SDRs will be closed and LLNL will be notified by letter of the SDR closure.

A written response is required for each observation delineated in Part 6.0 above. Responses are due within 20 working days of the date of the transmittal letter for this audit report.

Written responses are not required for recommendations contained within this audit report. The recommendations were generated by the audit team for the LLNL staff for consideration during implementation of its QA Program.

Audit 87-3
April 27, 1987

PREAUDIT CONFERENCE

John J. Dronkers	QA Specialist	LLNL	Livermore
Forrest D. Peters	QA Geologist	SAIC/QASC	Las Vegas
James M. Gromer	QA Engineer	SAIC/QASC	Las Vegas
Jerry Heaney	QA Engineer	SAIC/QASC	Las Vegas
Henry H. Caldwell	QA Engineer	SAIC/QASC	Las Vegas
Paul L. Cloke	Geochemist/Observer	BPMD/SAD	Columbus, OH
George D. Dymmel	Task Manager	SAIC	Las Vegas
U-Sun Park	Technical Staff	SAIC	Las Vegas
Henry Shaw	Task Leader	LLNL	Livermore
Ronald Barany	QA Specialist	LLNL	Livermore
Michael Revell	WP Systems Eng.	LLNL	Livermore
William Glassley	Task Leader	LLNL	Livermore
Deborah Kiraly	EQ3/6 Records	LLNL	Livermore
Bonnie Zucca	QA	LLNL	Livermore
Don Emerson	Task Leader	LLNL	Livermore
William O'Connell	Task Leader	LLNL	Livermore
Nancyellen Heckerroth	SQA	LLNL	Livermore
Barbara Alegre	Off. Asst.	LLNL	Livermore
D. Walden	QA Staff	LLNL	Livermore
Joanne Clark	QA Staff	LLNL	Livermore
L. Ballou	Tech. Area Leader	LLNL	Livermore
C. M. Thompson	Lead Auditor	SAIC/QASC	Las Vegas
L. Ramspott	WM. Prog. Leader	LLNL	Livermore
T. Wolery	EQ3/6 Lead Code Dev.	LLNL	Livermore
V. Oversby	Tech. Area Leader	LLNL	Livermore
Kenneth Eggert	Tech. Area Leader	LLNL	Livermore
Carl Newton	QA Manager, OGR	Doe/HQ	Washington, DC
Walter Kazor	Branch Mgr., A&S	SAIC	Las Vegas
Steven R. Mattson	Sen. Staff Geo.	SAIC	Las Vegas
Jesse L. Yow, Jr.	Deputy TPO	LLNL	Livermore
Howard Tewes	QA Staff	LLNL	Livermore
Edward Russell	Engineer	LLNL	Livermore
Tom Nelson	Design Task Ldr.	LLNL	Livermore
Ron Schwartz	QA Staff	LLNL	Livermore
Linda Hansen	Prog. Administrator	LLNL	Livermore
Florencio Ramirez	DOE/SAN Auditor	SAN/ESQA	Oakland, CA

ENCLOSURE A

Audit 87-3
April 29, 1987

EQ3/6 POST AUDIT CONFERENCE

W. R. Kazor	A&S Manager	SAIC	Las Vegas
Paul L. Cloke	Geochemist/Observer	BPMD/SAD	Columbus, OH
U-Sun Park	Technical Staff	SAIC	Las Vegas
L. Ramspott	Prog. Leader	LLNL	Livermore
John J. Dronkers	Dep. for QA	LLNL	Livermore
C. M. Thompson	Lead Auditor	SAIC	Las Vegas
H. H. Caldwell	QA Engineer	SAIC	Las Vegas
Bonnie Zucca	QA	LLNL	Livermore
Joanne Clark	QA	LLNL	Livermore
Howard Tewes	QA	LLNL	Livermore
Nancyellen Heckerroth	SQA	LLNL	Livermore
Ronald Barany	SQA	LLNL	Livermore
William O'Connell	Task Leader	LLNL	Livermore
Carl Newton	QA Manager	DOE/HQ, OGR	Washington, DC
Ken Eggert	Tech. Area Leader	LLNL	Livermore
Miki Moore	Computer Programmer	LLNL	Livermore
Kenneth J. Jackson	Geochemist/Code Dev.	LLNL	Livermore
Gerard Heaney	QA Engineer	SAIC	Las Vegas
Jim Gromer	QA Engineer	SAIC	Las Vegas
Thomas J. Wolery	EQ3/6 Lead Code Dev.	LLNL	Livermore
George D. Dymmel	Task Manager	SAIC	Las Vegas
Scott R. Brown	Auditor	BPMD	Columbus, OH
Ronald Schwartz	QA Staff	LLNL	Livermore
C. M. Thompson	Lead Auditor	SAIC/QASC	Las Vegas
Don Emerson	Task Leader	LLNL	Livermore

Audit 87-3
May 1, 1987

POST AUDIT CONFERENCE

Scott R. Brown	Auditor	Battelle	Columbus, OH
Florencio Ramirez	Lead Auditor	SAN/EDQA	DOE/SAN
Walter R. Kazor	Branch Mgr., A&S	SAIC	Las Vegas
Jim Blaylock	PQM	WMPO	Las Vegas
John J. Dronkers	QA Spec/	LLNL	Livermore
Carl Newton	QA Manager	DOE/OG	Washington, DC
Forrest Peters	QA Geologist	SAIC/QASC	Las Vegas
Gerard Heaney	QA Engr.	SAIC/QASC	Las Vegas
Jim Gromer	QA Engr.	SAIC/QASC	Las Vegas
Virginia Oversby	Tech. Area Leader	LLNL	Livermore
Henry Shaw	Task Leader	LLNL	Livermore
Larry Ramspott	Prog. Leader	LLNL	Livermore
George D. Dymmel	Task Manager	SAIC	Las Vegas
Henry H. Caldwell	QA Engineer	SAIC	Las Vegas
Kenneth Eggert	Tech. Area Leader	LLNL	Livermore
Ronald Barany	QA Spec.	LLNL	Livermore
Roger Aines	Task Leader	LLNL	Livermore
William Glassley	Task Leader	LLNL	Livermore
Michael Revelli	Task Leader	LLNL	Livermore
Lyn Ballou	Tech. Area Leader	LLNL	Livermore
Joanne Clark	QA Staff	LLNL	Livermore
D. Walden	QA Staff	LLNL	Livermore
Barbara Alegre	QA Staff	LLNL	Livermore
Howard Tewes	QA Staff	LLNL	Livermore
Bill McKenzie	Project Leader	LLNL	Livermore
Bonnie Zucca	QA	LLNL	Livermore
Ron Schwartz	QA	LLNL	Livermore
Linda Hansen	Project Adminis.	LLNL	Livermore
Amy Lizotte	QA Staff	LLNL	Livermore
Jesse L. Yow, Jr.	Deputy TPO	LLNL	Livermore

ENCLOSURE C

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

13510

Completed by Originating QA Organization

Apr.

Completed by Organization in Block 5

Comp. by Orig. QA Org.

1 Date 5/1/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During Audit 87-3-1		3a Identified By J. Gromer G. Heaney		3b Branch Chief Concurrence Date N/A	
4 SDR No. 020		Rev. 0			
5 Organization LLNL		6 Person(s) Contacted B. Zucca, R. Aines		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) NNWSI procedure SOP-02-01 "QAPP Requirements for Participating Organizations and ITS Support Contractors" (cont'd on Page 2)					
9 Deficiency Contrary to the above requirement LLNL does not have approved procedures for the handling, storage, shipping or identification of rock samples and J-13 water. (cont'd on Page 2)					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective 1) Develop appropriate procedures to comply with NNWSI requirements for the handling storage, shipping, and identification of samples. Include requirements for the handling and shipping of samples to subcontractors. (cont'd on Page 2)					
11 QAE/Lead Auditor Date <i>[Signature]</i> 5/1/87		12 Branch Manager Date <i>[Signature]</i> 5/14/87		13 Project Quality Mgr. Date <i>[Signature]</i> 5/12/87	
14 Remedial/Investigative Action(s)				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 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 Verification <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	



WMPO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

N-QA-038
10/86

SDR No. 020

Rev. 0

Page 2 of 2

BLOCK 8 REQUIREMENT (CONTINUED)

Rev. 1, para 5.1.1, states in part "Activities that affect quality shall be prescribed by documented instructions, procedures. . . ." (Refer to Audit Checklist Item No.'s 8.0-1, 13.0-1, 13.0-2, 13.0-3, T-1, T-2 and T-3).

BLOCK 9 DEFICIENCY (CONTINUED)

This deficiency was previously identified on WMPO-Audit Finding Sheet AFS 861-7 which was generated on March 27, 1986. the corrective action committed for resolution of the finding was to develop technical procedures for these activities. This action was to be completed March 15, 1987. Upon verification of corrective action implementation, it was discovered that there are still no approved procedures for these sample control activities.

BLOCK 10 RECOMMENDED ACTION(S)

- 2) Instruct appropriate personnel to new procedural requirements.
- 3) Investigate to determine if the lack of procedural direction has compromised sample identification and traceability.
- 4) Determine cause for not meeting commitment date for corrective action implementation on original audit finding AFS-861-7. Provide corrective action to prevent recurrence.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Origination QA Organization	1 Date 5/1/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
	3 Discovered During Audit 87-3-1		3a Identified By Carl Newton		3b Branch Chief Concurrence Date N/A	
	4 SDR No. 021		Rev. 0			
	5 Organization LLNL-QA - - -		6 Person(s) Contacted Ronald Schwartz, QA		7 Response Due Date is 20 Working Days from Date of Transmittal	
Completed by Organization In Block 5	8 Requirement (Audit Checklist Reference, if Applicable) 1) NNWSI SOP-02-01, "QAPP Requirements for Participating Organizations and NTS Support Contractors," Rev. 1, Para. 10.2.1.1, requires that planning for surveillances be documented (Refer to Audit Checklist Item No. 10.0-2 and 10.0-3 (cont'd on Page 2))					
	9 Deficiency 1) Contrary to the above requirement, LLNL has no surveillance plan for FY 87. In addition, LLNL Procedure No. 033-NWMP-P 18.1 "Surveillance Procedures," Rev. 0, Para. 18.1.4.3, states in part that "...surveillance (cont'd on Page 2)"					
	10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1) Revise LLNL Procedure No. 033-NWMP-P 18.1 to incorporate the requirements of NVO-196-17, Rev. 5. 2) Prepare a surveillance plan for FY 87. (cont'd on Page 2)					
	11 QAE/Lead Auditor Date <i>5/1/87</i>		12 Branch Manager <i>W.R. Kean</i>		Date <i>5/14/87</i>	
Completed by Orig. QA Org.	13 Project Quality Mgr. Date <i>Sam B. [unclear]</i>		<i>5/12/87</i>			
	14 Remedial/Investigative Action(s)					
	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 Response <input type="checkbox"/> Reject		QAE/Lead Auditor/Date		
20 Amended Response		<input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date		
21 Verification		<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 CONTINUATION SHEET

N-QA-038
10/86

SDR No. 021

Rev. 0

Page 2 of 2

BLOCK 8 REQUIREMENT (CONTINUED)

- 2) SOP-02-01, Para. 10.2.6.2, requires surveillance personnel to be qualified and certified, (Refer to Audit Checklist Item No. 10.0-12).
- 3) SOP-02-01, Para. 10.2.7, requires that surveillance records identify ten specific items, (Refer to Audit Checklist Item No. 10.0-5).
- 4) SOP-02-01, Para. 10.2.4.3, states that "The items acceptance shall be documented and approved by identified authorized personnel." (Refer to Audit Checklist Item No. 10.0-9).

BLOCK 9 DEFICIENCY (continued)

1) continued

planning need not be documented."

- 2) Contrary to the above requirement, LLNL has not established qualification or certification requirements for surveillance personnel
- 3) Contrary to the above requirement, the only LLNL surveillance report that has been issued for FY 87 does not identify the date of the surveillance.
- 4) Contrary to the above requirement, the Surveillance Report that was issued by LLNL was not signed.

BLOCK 10 RECOMMENDED ACTION(S) (continued)

- 3) Establish and document the qualifications of surveillance personnel document in accordance with NVO-196-17, Rev. 5.

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3/87

Completed by Originating QA Organization	1 Date 5/1/87		2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3		Page 1 of 1	
	3 Discovered During Audit 87-3-1		3a Identified By Carl Newton		3b Branch Chief Concurrence Date N/A	
	4 SDR No. 022		Rev. 0			
	5 Organization LLNL		6 Person(s) Contacted Ronald E. Schwartz, QA		7 Response Due Date is 20 Working Days from Date of Transmittal	
Completed by Organization in Block 5	8 Requirement (Audit Checklist Reference, if Applicable) LLNL Procedure No. 033-NWMP-15.0, "Nonconformances," Rev. 0, Para. 15.0.8 requires the Deputy for QA/designee to review the Nonconformance Log monthly and indicate this review by signing and dating the Log. (Refer to Audit Checklist Item No. 15.0-3)					
	9 Deficiency Contrary to the above requirement, the required monthly reviews have not been documented.					
	10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective Comply with 033-NWMP-P 15.0					
Completed by Organization in Block 5	11 QAE/Lead Auditor Date		12 Branch Manager Date		13 Project Quality Mgr. Date	
	5/1/87		R. E. Schwartz 5/4/87		James B. Smith 5/2/87	
Completed by Org. QA Org.	14 Remedial/Investigative Action(s)					
	15 Effective Date					
	16 Cause of the Condition & Corrective Action to Prevent Recurrence					
Completed by Org. QA Org.	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 Verification <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date		Branch Manager/Date	
Completed by Org. QA Org.	22 Remarks					
	23 QA CLOSURE					
QAE/Lead Auditor/Date		Branch Manager/Date		PQM/Date		

WMPO STANDARD DEFICIENCY REPORT

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3/87

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

1 Date 5/1/87		2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3		Page 1 of 2	
3 Discovered During Audit 87-3-1		3a Identified By W. R. Kazor		3b Branch Chief Concurrence Date N/A	
4 SDR No. 023		Rev. 0			
5 Organization LLNL		6 Person(s) Contacted B. Zucca/ P. Walden/ B. Alegre, QA		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) NNWSI SOP-02-01, "QAPP Requirements for Participating Organizations and NTS Support Contractors," Rev. 1, Para. 17.2.3 requires each organization to maintain a list which contains the signature and initials of the personnel (cont'd on Page 2)					
9 Deficiency Contrary to the above requirements, the required list has not been established.					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective Prepare and maintain the required list.					
11 QAE/Lead Auditor Date <i>[Signature]</i> 5/1/87		12 Branch Manager <i>W.R. Kazor</i> 5/14/87		13 Project Quality Mgr. Date <i>James B. England</i> 5/22/87	
14 Remedial/Investigative Action(s) 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 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 Verification <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					



**WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

**N-QA-03
10/86**

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Rev. 0

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BLOCK 8 REQUIREMENT (CONTINUED)

authorized to authenticate records. (Refer to Audit Checklist Item No. 17.0-3B).

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

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

1 Date 5/1/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During Audit 87-3-1		3a Identified By Carl Newton		3b Branch Chief Concurrence Date N/A	
4 SDR No. 024		Rev. 0			
5 Organization LLNL		6 Person(s) Contacted John J. Drankers		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) 1) NNWSI SOP-02-01, "QAPP Requirements for Participating Organizations and NTS Support Contractors," Rev. 1, Para. 18.2.1.2 requires audits of external organizations at least annually. (cont'd on Page 2)					
9 Deficiency 1) LLNL has contracted other national laboratories to perform work for the NNWSI Project (i.e. ANL-CH and HEDL-RL). These laboratories are funded by other DOE Operations Offices. Contrary to the above requirement, audits of these laboratories are not being performed. (continued on next page)					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input type="checkbox"/> Corrective 1) Schedule and perform audits of ANL and HEDL. 2) Determine the status of all open audits and aggressively pursue closure. (cont'd on Page)					
11 QAE/Lead Auditor Date 5/1/87		12 Branch Manager J. Drankers		13 Project Quality Mgr. Date 5/2/87	
14 Remedial/Investigative Action(s)					
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 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 Verification <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					



WMPO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

N-QA-0:
10/86

SDR No. 024

Rev. 0

Page 2 of 2

BLOCK 8 REQUIREMENT (continued)

- 2) SOP-02-01, Para 18.1.1, requires follow-up actions on audits (Refer to Audit Checklist Item No. 18.0-4)
- 3) SOP-02-01, Para 18.2.7, requires in part, that audit records include the results for each completed audit plan item (Refer to Audit Checklist Item No. 18.0-16).

BLOCK 9 DEFICIENCY (CONTINUED)

- 2) Contrary to the above requirements, findings from audits are allowed to remain open without apparent follow-up action; findings from Audit No.'s 86-4 and 86-5 have remained open for over a year.
- 3) Contrary to the above requirements, annotated checklists indicating the results of each checklist question were largely missing from the records of audits performed in FY-86. The checklists had many unexplained blanks for the FY 87 audits.

RECOMMENDED ACTION(S)

- 3) Review all audit checklists, and enter appropriate explanations of the blanks
- 4) Determine the cause of the cited conditions and take appropriate corrective action to prevent recurrence.



Department of Energy

Nevada Operations Office

P. O. Box 98518

Las Vegas, NV 89193-8518

AUG 14 1987

Michael E. Spaeth
Technical Project Officer
for NNWSI
Science Applications
International Corporation
101 Convention Center Drive
Suite 407
Las Vegas, NV 89109

WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) AUDIT 87-4 OF SCIENCE APPLICATIONS INTERNATIONAL CORPORATION/TECHNICAL & MANAGEMENT SUPPORT SYSTEMS (SAIC/T&MSS) SUPPORT OF THE NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS (NNWSI) PROJECT (WMPO ACTION ITEM #87- 2264)

Enclosed is the report for QA Audit 87-4, which was conducted for the WMPO at SAIC/T&MSS June 15 through June 22, 1987.

The audit reviewed sufficient objective evidence related to the SAIC/T&MSS Quality Assurance Program Plan (QAPP) to confirm that the SAIC/T&MSS Program is in general compliance with the NNWSI Project Quality Assurance Plan NVO-196-17, Revision 4. The distribution of the deficiencies, however, indicates the need for increased management attention on the Configuration Management and Meteorological and Air Quality tasks. Deficiencies are described in Section 6.0 of this report.

During the course of the audit, the audit team generated 11 Standard Deficiency Reports (SDRs) (Nos. 042-046 and 048-053), 7 observations, and 2 recommendations. The action copies of the SDRs were transmitted to you by WMPO letter JB-2372 on July 20, 1987. Copies of these SDRs are also enclosed with this audit report for your information.

Written responses to the seven observations contained within this report are required. These responses are due within 20 working days of the transmittal date of this report. Please address your responses to me and concurrently send a copy of each observation response to Nita J. Brogan, SAIC, Las Vegas, Nevada.

The two recommendations contained in this audit report are submitted for your staffs consideration during the implementations of your QAPP and technical activities in support of the NNWSI Project.

By copy of this letter the audit is considered closed. Any open SDRs or observations will continue to be tracked until each is closed.

WMPO QUALITY ASSURANCE AUDIT REPORT

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION/
TECHNICAL & MANAGEMENT SUPPORT SYSTEMS

JUNE 15-22, 1987

Prepared by:

C. M. Thompson

C. M. Thompson - Lead Auditor

Date:

8/3/87

Approved by:

James Blaylock

James Blaylock - PQM (WMPO)

Date:

8/3/87

1.0 INTRODUCTION

This report contains the results of the Quality Assurance Audit of Science Applications International Corporation/Technical and Management Support Services (SAIC/T&MSS), Las Vegas, Nevada. The audit was conducted June 15 through 22, 1987, in accordance with the WMPO Quality Assurance Program Plan, NVO-196-18, Rev. 2, and Quality Management Procedure (QMP) 18-01, Rev. 1.

2.0 AUDIT SCOPE

The purpose of the audit was to evaluate the effectiveness of the SAIC/T&MSS Quality Assurance Program with respect to the requirements of NNWSI Project NVO-196-17, Rev. 4, and to verify the implementation of the Quality Assurance Program as it relates to activities on the NNWSI Project.

3.0 AUDIT TEAM PERSONNEL

The audit team consisted of the following members:

Lead Auditor: C. M. Thompson, SAIC, Las Vegas

Auditors:	Gerard Heaney	Auditor	SAIC, Las Vegas, NV
	Forrest D. Peters	Auditor	SAIC, Las Vegas, NV
	Robert H. Klemens	Auditor	SAIC, Las Vegas, NV
	Theodore Vetter, Jr.	Auditor	SAIC, Las Vegas, NV
	Frederick J. Ruth	Auditor	SAIC, Las Vegas, NV
	Pietro N. Colpo	Technical Specialist	SAIC, Lynchburg, VA
	David J. Brown	Auditor	DOE/HQ (Weston)

4.0 SUMMARY OF AUDIT RESULTS

Evaluation of the SAIC/T&MSS Quality Assurance Program and selected tasks indicates general compliance with NNWSI NVO-196-17, Rev. 4 requirements. Eleven deficiencies were identified during the course of the audit. The team also generated seven observations and two recommendations. The deficiencies reported in this audit have also been identified in previous WMPO audits of SAIC/T&MSS audits. The repetitive nature of these deficiencies highlights a need for increased management attention in providing more positive and meaningful corrective action to the indicated problems in Configuration Management, and Meteorological and Air Quality tasks. The deficiencies, observations, and recommendations are delineated in Section 6.0 of this audit report.

To the extent audited, the audit team determined that the following program elements of the SAIC/T&MSS Quality Assurance Program were in compliance with the NNWSI Project Quality Assurance Program requirements:

- 1.0 Organization
- 2.0 QA Program
- 12.0 Control of Measuring and Test Equipment
- 13.0 Handling, Storage and Shipping
- 15.0 Control of Nonconforming Items

Certain program elements were not audited at this time because they have not as yet been implemented. These are:

- 9.0 Control of Special Processes
- 10.0 Inspection
- 11.0 Test Control
- 14.0 Inspection, Test, and Operating Status
- 16.0 Corrective Action

Program elements which the audit team identified as being deficient were:

- 3.0 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 Identification and Control of Items
- 17.0 Quality Assurance Records
- 18.0 Audits

The deficiencies were qualified by the application of severity levels which are related to the significance of the finding. A discussion of the severity levels is provided in Enclosure I. Nine of the deficiencies were classified as Severity Level 2; two were classified as Severity Level 3.

Five of the seven observations identified during the audit were programmatic in nature. The observations identify conditions that are presently not a violation of procedural requirements, but, in the opinion of the audit team, could lead to a violation of requirements in the future. The observations were in the programmatic areas of training, procurement document control, and records management.

The two recommendations offered were in the programmatic areas of training and procurement.

The audit team also audited SAIC/T&MSS implementation of the following specific tasks:

1. Configuration Management and Change Control (1.2.1.2.5)
2. Meteorological & Air Quality (1.2.3.6.1.1)
3. Radiological Monitoring (1.2.3.6.1.2)
4. Transportation Planning & Analysis (1.2.3.6.2)
5. Environmental Regulatory Interaction (1.2.5.3.3)
6. Computer Support Services (1.2.9.1.1.4)
7. Information Management (1.2.9.1.4)

The findings relative to the Configuration Management and Change Control, Computer Support Services, and Information Management tasks were reported previously with the programmatic areas of Document Control (Element 6.0), Design Control (Element 3.0), and QA Records (Element 17.0) respectively. There were no deficiencies or observations identified for the Transportation Planning & Analysis or the Environmental Regulatory Interaction tasks, whereas the task of Radiological Monitoring was not audited at this time as there was no activity on-going. The Meteorological & Air Quality task was found to be out of compliance in four areas and, in addition, two observations were written. As previously stated, the performance of this task should be reviewed by management and the necessary corrective actions should be taken.

5.0 AUDIT MEETINGS

5.1 PREAUDIT CONFERENCE

A preaudit conference was held on June 15, 1987, at 1:00 p.m. The purpose, scope, and agenda of the audit were reviewed with the SAIC/T&MSS staff. The audit team member's counterparts were identified and lines of communication were established. (See Enclosure 2 for attendees.)

5.2 POSTAUDIT CONFERENCE

A postaudit conference was held on June 22, 1987, at 1:00 p.m. The results of the audit and the SDRs, observations, and recommendations identified during the course of the audit were presented to the SAIC/T&MSS staff. Rough draft copies of the SDRs, observations, and recommendations were provided to SAIC/T&MSS management at this time. (See Enclosure 3 for attendees.)

6.0 SYNOPSIS OF SDRs/OBSERVATIONS/RECOMMENDATIONS

STANDARD DEFICIENCY REPORTS

1. Software Requirements Request forms were not prepared and processed as required by administrative procedure SAIC/T&MSS AP 1.24. Refer to SDR No. 042 - Severity Level 2.

2. Computer software has been prepared and executed without the documentation and control required by SAIC/T&MSS QP 3.2 and AP 1.24. Refer to SDR No. 043 - Severity Level 2.
3. Change Orders for QA Level I procurements have not been transferred to the WMPO as required by SAIC/T&MSS QP 4.1. Refer to SDR No. 044 - Severity Level 2.
4. A current/accurate "NNWSI Project List of Controlled Documents" has not been maintained as required by QP 6.1. Refer to SDR No. 045 - Severity Level 2.
5. Failure to implement prompt corrective action and issue AP 1.5. Refer to SDR No. 046 - Severity Level 2.
6. Failure to meet the prescribed time restraints for the issuance of Audit and Surveillance Reports. Refer to SDR No. 048 - Severity Level 3.
7. Failure to prepare and issue an operator instruction manual as required by the SAIC/T&MSS Meteorological Monitoring Plan. Refer to SDR No. 049 - Severity Level 2.
8. Failure to meet the prescribed content and time restraints for reports required by the Meteorological Monitoring Plan. Refer to SDR No. 050 - Severity Level 2.
9. The required independent system audits of the Meteorological Monitoring Plan have not been conducted as required. Refer to SDR No. 051 - Severity Level 2.
10. Nonconforming conditions identified within the Meteorological Monitoring Plan are not being reported on QA Nonconformance Reports as required. Refer to SDR No. 052 - Severity Level 2.
11. Processing QA Records in accordance with AP 6.1 instead of QP 17.1 as committed to in the SAIC/T&MSS QAPP. Refer to SDR No. 053 - Severity Level 3.

OBSERVATIONS

Observation No. 1

SAIC/T&MSS QP 2.2, "Indoctrination and Training of Personnel Performing Quality Related Activities," Rev. 2, dated December 20, 1986, Para. 5.1.1 requires that personnel performing QA Level I and/or Level II activities receive QA indoctrination and training.

During the review of procurement activities, it was found that there is no objective evidence that the SAIC purchasing agent, C. McSweeney, in La Jolla, California, has received the required indoctrination and training.

This is considered to be an observation and not a deficiency because SDR-012 of Surveillance Report No. WMPD-SR-87-014 has identified this condition for other personnel.

Observation No. 2

SAIC/T&MSS QP 7.1, "Control of Purchased Items and Services," Rev.2, dated December 20, 1986, Para. 5.6.2.4 states that a Certificate of Conformance should be issued by the supplier and transmitted to SAIC/T&MSS when required by the Purchase Order.

During the review of the Receiving Inspection Reports for the Information Management System, it was found that the Certificates of Conformance had not been issued for five of six items shipped to SAIC/T&MSS.

This is considered to be an observation because the condition has been noted during a T&MSS QA surveillance of Receiving Inspection. The surveillance report and resulting nonconformance report had not been issued as of June 19, 1987.

Observation No. 3

SAIC/T&MSS QP 4.1, "Procurement Document Control," Rev. 2, dated December 20, 1986. Para. 4.6 requires that the SAIC purchasing agent obtain the QA Manager's approval of all purchase orders and related changes that pertain to QA Level I or II items or activities.

During the review of the Purchase Orders and Change Orders, it was found that the following Change Orders to Level I items were issued without the review and approval of the QA Manager:

Radon Monitoring System - 11-870113-1-54
11-870114-2-54
11-87011402-54

This deficiency is considered to be an observation because this generic condition was noted in T&MSS QA Surveillance Report WMPD SR-87-04, dated May 22, 1987 as NCR #SAIC-019. The recommended response to this NCR is to review all Purchase Orders and Change Orders to verify approval of the QA Manager for QA Level I and II items and activities.

Observation No. 4

During the review of the controlled document distribution lists located in Configuration Management, the following observations were made:

- Document Transmittal Records (DTRs) are not being returned in a timely manner. An open NCR identifies this problem (NCR SAIC-013), however the problem appears to be more widespread than was initially identified.
- Some recipients of controlled documents are not presently full-time staff (i.e., A.E. Cocoros and J.L. Donnell) and should be taken off distribution to avoid the possibility of additional unreturned DTRs.
- The distribution of controlled manuals may be excessive in some cases (i.e., QASC receives five controlled copies of the NNWSI Project Filing System Index and LLNL receives six controlled copies of the NNWSI Project Administrative Procedures; four of these are assigned to LLNL QA)

In the opinion of the Audit Team, SAIC/T&MSS management should provide greater attention to the staffing needs of this group to maintain the required control of documents now and in the future.

Observation No. 5

The Correspondence Control Facility in operation at SAIC/T&MSS to control incoming and outgoing correspondence and capture NNWSI Project related documents for the Project files, was established to the requirements of Administrative Procedure 6.1 and IMS Procedure 3. This audit has identified the following deviations from AP 6.1 and IMS Procedure 3 requirements which have been observed at the CCF:

1. AP 6.1, para. 5.2.1.4h, requires that QA levels be assigned to the first page of the correspondence. Over 19,000 documents which are indexed and packed in cartons prior to shipment to MASSF are marked "TBD." Many of these documents also require the addition of the WBS number to page one of the document.
2. The handling of internal correspondence as indicated by Figure 7, Flow Chart, in AP 6.1, requires the application of a date stamp. This is not being done.
3. The 100% check to verify each entry by a search data entry operator as required by para. 5.7.1 of IMS Procedure 3 is not being done.
4. Para. 5.7.2 of IMS Procedure 3 calls for a daily printout to be used by the CCF operator to proof all entries listed. This is not being done although the daily reading file which contains considerably less data than the daily printout is used to proof entries.

5. Para. 5.7.3 of IMS Procedure 3 requires statistical quality control measures including daily random samples to measure consistency, accuracy, and speed. This is not being done at present. A sampling procedure (IMS Procedure 4) is being developed with a proposed completion date of 9/87.
6. Para. 5.6 of AP 6.1 describes the requirements for handling correspondence drafted for WMPO by SAIC/T&MSS personnel. These requirements are not being followed in detail. The use of the document transmittal form is not adequately defined in AP 6.1 and contrary to requirements it does not get sent to CCF for filing with the original draft package. In addition, the concurrence copy of a document receives a different accession number than the actual final copy of the document. This appears to be in conflict with para. 5.6 of AP 6.1.
7. AP 6.1 does not address the protection of records against damage from moisture, temperature, and pressure, deterioration or loss. Over 20 cartons of records are temporarily being stored on top of file cabinets in the CCF.
8. The requirement for CCF personnel to examine Project-related correspondence for completeness and legibility contained in para. 5.1.2.4 of AP 6.1 does not emphasize the importance of looking at every page of every document. This inspection is done as a receiving function of incoming documents, and appears to be functioning properly on documents with only several pages, but may not be adequate for thick, multi-page documents such as reports or data packages. This is a problem because of the large volume of incoming documents and the limited staff at CCF. Additional training and an adequate staff to check every page of every document is required. This inspection is the only complete inspection being done. Therefore, it is in effect, equivalent to the validation referenced in QP 17.1, para. 5.3, although Records Declaration Forms are not in use.

It is understood that many of the above problems have been previously called to the attention of SAIC/T&MSS management and that changes and additions to AP 6.1 are in process or are being planned. Your response to this observation should address each problem and present proposed corrective actions.

Observation No. 6

Tables 6.2.1 and 6.2.2 in the Meteorological Monitoring Plan identify suggested Monthly Report formats and suggested Quarterly Report formats, respectively. Although these are only suggested formats, it is advisable that this subject matter be incorporated into these reports to ensure this important information is recorded, documented, and retained.

Observation No. 7

The reporting of data under the Meteorological Monitoring Plan was initiated on December 1, 1985, yet the NNWSI Project MMP Instructions for Operation and Calibration Check of Meteorological Monitoring Equipment was not approved until May 1, 1986. A methodology needs to be developed to establish how the validity of the data collected between December 1, 1985 and May 1, 1985 will be evaluated.

RECOMMENDATIONS

Recommendation No. 1

The present system of filing training attendance rosters in personnel files cannot ensure that all affected personnel are trained. Although there is no procedural requirement to do so, it is recommended that a matrix be developed to document the T&MSS personnel performing QA Level I and II activities and to indicate what indoctrination and training has been received.

Recommendation No. 2

The master purchasing file is maintained at SAIC in La Jolla; therefore, a complete review of the files in Las Vegas cannot be ensured. It is recommended that SAIC/T&MSS verify that a complete and accurate file exists.

7.0 REQUIRED ACTION

A written response is required for each Standard Deficiency Report delineated in Section 6.0. Copies of the SDRs were previously forwarded for your action. Responses are due within 20 working days of the date of the SDR transmittal letter. Upon acceptance of the responses and satisfactory completion of all remedial and corrective actions, the SDRs will be closed and SAIC/T&MSS will be notified by letter of the SDR closure.

A written response is also required for each observation delineated in Section 6.0. Responses are due within 20 working days of the date of the transmittal letter for this audit report.

Written responses are not required for the recommendations contained within this audit report. The recommendations were generated by the audit team for the SAIC/T&MSS staff's consideration during implementation of its Quality Assurance Program.

SEVERITY LEVELS

Severity Level 1 - Significant deficiencies considered of major importance. These deficiencies require remedial, investigative, and corrective actions to prevent recurrence.

Severity Level 2 - A deficiency which is not of major importance, but may also require remedial, investigative, and/or corrective action to prevent recurrence.

Severity Level 3 - A minor deficiency in that only remedial action is required. These deficiencies are generally isolated in nature or have a very limited scope. In addition, the integrity of the end result of the activity is not affected nor does the deficiency affect the ability to achieve those results.

Remedial Action - Actions taken to correct the specific deficiencies noted on the SDR.

Investigative Action - Actions taken to further examine the deficient condition to determine the extent and depth. This action should identify all conditions similar to the examples listed on the SDR.

Corrective Action - Actions taken to identify the cause of the condition and to prevent recurrence of the condition identified on the SDR.

Audit 87-4
June 15, 1987

PRE-AUDIT CONFERENCE

Frederick J. Ruth	QA Engineer	SAIC/QASC	Las Vegas
Robert H. Klemens	QA Engineer	SAIC/QASC	Las Vegas
Dave Brown	QA Engineer	HQ-DOE/Weston	Washington, DC.
Michael I. Foley	AD-TPD	SAIC/T&MSS	Las Vegas
J. R. LaRiviere	Dir.-PSED	SAIC/T&MSS	Las Vegas
Forrest D. Peters	QA Geologist	SAIC/QASC	Las Vegas
Steven Woolfolk	SR. Health Phy.	SAIC/T&MSS	Las Vegas
Jim Blaylock	PQM	DOE/NV	Las Vegas
Edward W. McCann	Envir. Br. Mgr.	SAIC	Las Vegas
Martin Jablonski	Air. Qual. Anal.	SAIC	Las Vegas
Roger Hardwick	CSS Mgr.	SAIC	Las Vegas
J. E. Therien	T&MSS QAE	SAIC	Las Vegas
R. D. Kettell	T&MSS QAE	SAIC	Las Vegas
T. Vetter, Jr.	QA Engr.	SAIC/QASC	Las Vegas
P. N. Colpo	Tech. Specialist	SAIC	Lynchburg, VA
Jerry Heaney	QA Engineer	SAIC	Las Vegas
Elena V. Ruth	Secretary	SAIC/CMB	Las Vegas
Larry L. Andrist	CM Analyst	SAIC/CMB	Las Vegas
Mae D. Cotter	Infor. Mgmt. Spec.	SAIC/CMB	Las Vegas
W. B. Andrews	Engineer	SAIC	Las Vegas
R. Belyea	Branch Mgr.	SAIC/CMB	Las Vegas

Audit 87-4
June 22, 1987

POST-AUDIT CONFERENCE

William Macnabb	Asst. Project Mgr.	SAIC	Las Vegas
J. E. Therien	T&MSS QAE	SAIC/T&MSS	Las Vegas
Mae D. Cotter	Dev. Mgmt. Spec.	SAIC/T&MSS	Las Vegas
R. A. Kettell	T&MSS/QA	SAIC/T&MSS	Las Vegas
Bill Andrews	Sr. Engineer	SAIC/T&MSS	Las Vegas
John Shaler	Tech. Coord.	SAIC/T&MSS	Las Vegas
Stan Klein	Mgr. QA	SAIC/QASC	Las Vegas
Duane Sternberg	Info. Mgmt. Spec.	SAIC/T&MSS	Las Vegas
Frederick J. Ruth	QA Engineer	SAIC/QASC	Las Vegas
Michael I. Foley	Ad. Dir. TPD	SAIC/TPD	Las Vegas
Jerry Heaney	QAE	SAIC/QASC	Las Vegas
P. N. Colpo	Tech. Specialist	SAIC	Lynchburg, VA
James Lou	Proj. Analyst	SAIC/CSS	Las Vegas
Harry Leake	Software	SAIC/CSS	Las Vegas
Lynda Gremore	CCF Supvr.	SAIC/IMS	Las Vegas
Nadine Karan	IMS	SAIC/IMS	Las Vegas
R. J. West	Lic. Eng.	SAIC/Lic. Br.	Las Vegas
Forrest D. Peters	QA Geologist	SAIC/QASC	Las Vegas
Steven Woolfolk	Health Phys.	SAIC/TPD	Las Vegas
W. R. Kazor	Act. Mgr. A&S	SAIC/QASC	Las Vegas
C. S. Jonson	Dir. Proj. Div.	SAIC	Las Vegas
J. R. LaRiviere	Dir. PSED	SAIC	Las Vegas
R. Belyea	CM Branch Mgr.	SAIC	Las Vegas
Elena Ruth	CM Branch Sec.	SAIC	Las Vegas

ENCLOSURE 3

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

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

1 Date 6/22/87		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 87-4		3a Identified By C. Thompson P. Colpo		3b Branch Chief Concurrence Date N/A	
4 SDR No. 042		Rev. 0		7 Response Due Date is 20 Working Days from Date of Transmittal	
5 Organization SAIC/T&MSS		6 Person(s) Contacted L. Uhler			
8 Requirement (Audit Checklist Reference, if Applicable) AP 1.24, Rev. 0 "T&MSS Software Development and Maintenance", Section 5.1 requires that the Software requestor ensure that all proper approvals (cont'd)					
9 Deficiency According to the minutes of the Software Review Board meeting of April 24, 1987, seven (7) Software Requirement Requests were considered by the (cont'd)					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1. Complete the approval/disapproval disposition in Section VI of the Software Requirements Request Forms and provide copies to the requestors. (cont'd)					
11 QAE/Lead Auditor Date <i>[Signature]</i> 7/6/87		12 Branch Manager Date <i>[Signature]</i> 7/7/87		13 Project Quality Mgr. Date James Blaylock 7/15/87	
14 Remedial/Investigative Action(s)				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 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	



..MPO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

N-QA-031
10/86

SDR No. 042

Rev. 0

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Block 8 REQUIREMENT (cont'd)

are obtained prior to presenting the Software Requirements Request to the Software Review Board. The Software Requirements Request Form is intended to guide the requestor through the proper software request cycle and provide the necessary documented traceability.

Sections 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5 and 5.2.3 of AP 1.24 identify additional specific requirements in the software request cycle.

Block 9 DEFICIENCY* (cont'd)

Board and eleven (11) forms were completed. A review of the Software Requirement Request forms completed revealed the following discrepancies:

- | | |
|--|---|
| 1) Number of improper forms used | 3 |
| 2) Number of instances when the QA level of the proposed software was not indicated. | 3 |
| 3) Number of instances where no QA approval was obtained. | 8 |
| 4) Number of instances when no estimate of resources required was provided. | 3 |
| 5) Number of cases where no Configuration Management Branch acknowledgement was provided. | 8 |
| 6) Number of instances where the Software Review Board approval/disapproval disposition was not documented by the Software Review Board Chairperson. | 7 |
| 7) Number of instances where the required functional description was not provided. | 6 |

(Refer to Audit Checklist Item Nos. 3.0-8B-2, 6.11 and 14)

Block 10 RECOMMENDED ACTION (cont'd)

2. Assure the development of an adequate functional description of the required software.

3. Investigate and make the changes necessary to ensure that the Software Requirement Request Form is routed to the proper individuals and that the routing process is expedient.

4. Take measures to identify the cause of this deficiency and specify measures to preclude recurrence.

WMPO STANDARD DEFICIENCY REPORT

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

1 Date 6/22/87		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 87-4		3a Identified By C. Thompson P. Colpo		3b Branch Chief Concurrence Date N/A	
5 Organization SAIC/T&MSS		6 Person(s) Contacted B. Andrews		4 SDR No. 043 Rev. 0	
7 Response Due Date is 20 Working Days from Date of Transmittal					
8 Requirement (Audit Checklist Reference, if Applicable) T&MSS Quality Assurance Procedure QP 3.2, "Use and Control of Computer Programs", Rev. 2, Para. 5.5 states in part that "Only SES (cont'd)"					
9 Deficiency During an interview with T&MSS personnel assigned to the Transportation Planning and Analysis Task No. 1.2.3.6.2, it was determined that (cont'd)					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1) Characterize the software by identifying the programs. 2) Develop the necessary documentation to describe the code (cont'd)					
11 QAE/Lead Auditor Date <i>[Signature]</i> 7/6/87		12 Branch Manager Date <i>[Signature]</i> 7/7/87		13 Project Quality Mgr. Date James Blaylock 7/15/87	
14 Remedial/Investigative Action(s)					
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 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					



W O STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

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Rev. 0

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Block 8 REQUIREMENT (cont'd)

and Auxiliary Software that has been documented and controlled in accordance with the procedure shall be used for T&MSS Project activities in support of the WMPO for Quality Assurance Level I, II, or III activities, as appropriate."

Section 5.4 of QP 3.2 further defines requirements for the responsibility for preparation of software documentation, for the extent of documentation development, and for software control.

In addition, the Administrative Procedure 1.24, "T&MSS Software Development and Maintenance", Rev. 0, 1/27/87, establishes the requirements for the development and control of software within T&MSS.

Block 9 DEFICIENCY (cont'd)

computer software (unnamed) is currently being used to perform risk analysis, a QA Level II activity. It was also determined that except for the source code, there is no documentation to support the development, existence, control, and use of the software. (Refer to Audit Checklist Item No. 3.0-88-1)

Block 10 RECOMMENDED ACTIONS

capabilities, method and models used to describe code usage, and to describe the testing performed to verify and validate the software.

3) Send to the Configuration Management Branch Manager a copy of the approved computer software documentation package and computer code to establish appropriate baselines and place the software under the change control procedure.

4) Determine the cause of this deficiency and identify the steps that will be taken to prevent recurrence.

5) Investigate all other Level I and II activities for the possibility of a similar deficiency and taken appropriate remedial and corrective action.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date 6/22/87		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 87-4		3a Identified By D. J. Brown		3b Branch Chief Concurrence Date N/A
4 SDR No. 044		Rev. 0		
5 Organization SAIC/T&MSS		6 Person(s) Contacted J. Therien, D. Kettell		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) SAIC/T&MSS QP 4.1, "Procurement Document Control", Rev. 2, Para. 5.3.5, requires that all approved QA Level I purchase orders be (cont'd)				
9 Deficiency There is no objective evidence that the following change orders for QA Level I items have been transmitted to WMPO: 11-87-0113-1, 11-87-0114-1&2 (cont'd)				
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input type="checkbox"/> Corrective 1) Forward these change orders to the WMPO. 2) Verify that all purchase orders and change orders (cont'd)				

Completed by Organization in Block 5

11 QAE/Lead Auditor Date <i>[Signature]</i> 7/6/87	12 Branch Manager Date <i>[Signature]</i> 7/6/87	13 Project Quality Mgr. Date <i>[Signature]</i> 7/15/87
14 Remedial/Investigative Action(s)		15 Effective Date _____
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 Verification	<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



WMP0 STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

N-QA-036
10/86

SDR No. 044

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Block 8 REQUIREMENT (cont'd)

transmitted to the WMP0. Per Para. 5.3.7, this applies to change orders also.

Block 9 DEFICIENCY (cont'd)

11-880041-1, 11-880042-1, 11-880044-1. (Refer to Audit Checklist Item No. 4.0-6B)

Block 10 RECOMMENDED ACTION (cont'd)

for QA Level I items have been transmitted to the WMP0.

3. Identify what actions will be taken to prevent the recurrence of this deficiency.

WMPU STANDARD DEFICIENCY REPORT

N-0A-038
3/87

Completed by Originating QA Organization	1 Date 6/22/87		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 87-4		3a Identified By G. Heaney		3b Branch Chief Concurrence Date N/A	
	4 SDR No 045		Rev. 0			
	5 Organization SAIC/T&MSS		6 Person(s) Contacted D. Belyea		7 Response Due Date is 20 Working Days from Date of Transmittal	
Completed by Organization in Block 5	8 Requirement (Audit Checklist Reference, if Applicable) T&MSS Quality Assurance Procedure QP 6.1 "Document Control", Rev. 2, Para. 4.3 requires that the Configuration Management Branch (CMB) Manager (cont'd)					
	9 Deficiency The latest "NNWSI Project List of Controlled Documents" dated March 27, 1987 (ref. correspondence L87-CM-RB-003) is not accurate in listing current (cont'd)					
	10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective 1. Update the present list of controlled documents. 2. Develop a system to track the status of a large number (cont'd)					
Completed by Organization in Block 5	11 QAE/Lead Auditor Date <i>[Signature]</i> 7/7/87		12 Branch Manager Date <i>[Signature]</i> 7/7/87		13 Project Quality Mgr. Date <i>[Signature]</i> 7/15/87	
	14 Remedial/Investigative Action(s)					
	15 Effective Date					
Completed by Org. QA Org.	16 Cause of the Condition & Corrective Action to Prevent Recurrence					
	17 Effective Date					
	18 Signature/Date					
Completed by Org. 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 Verification <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date		Branch Manager/Date	
	22 Remarks					
QAE/Lead Auditor Date		Branch Manager Date		PQM Date		



WPO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

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Block 8 REQUIREMENT (cont'd)

maintain a list of controlled documents. This list shall be distributed in accordance with OP 5.1 and NNWSI AP 1.5.

Note: AP 1.5 "Issuance and Maintenance of Controlled Documents" is presently in draft form. The draft will require the CMB manager to update on a monthly basis a listing of controlled documents including current revision. (Refer to Audit Checklist Item Nos. 5.0-1, 5.0-8)

Block 9 DEFICIENCY (cont'd)

NNWSI procedures and their revision status. A review of the list of controlled documents vs. a controlled copy of the WPO OAPP, Rev. 2 (NVO-196-18) indicated the following discrepancies:

- 1) The list did not reference OMP-05-01 "QMP Format and Preparation" Rev. 0, dated 3/27/87 which superseded OMP-06-01, Rev. 0 dated 12/10/87. OMP-06-01 is still listed.
- 2) OMP-18-01 "Audits" was revised on 3/27/87 but the list still shows OMP-18-01 as Rev. 0 dated 12/10/84.
- 3) OMP-16-02 "Trend Analysis" was revised on 3/27/87 but the list still shows OMP-16-02 as Rev. 0 dated 12/10/84.
- 4) OMP-16-03 "Standard Deficiency Reporting System" Rev. 0 dated 3/27/87 is not listed.

Block 10 RECOMMENDED ACTION

design documents which will be accessible to all design document users.

- 3) Expedite the review and approval of AP 1.5.
- 4) Train appropriate personnel to procedural requirements.
- 5) Establish cause of the deficiency and identify measures to preclude recurrence.

DISCUSSION

Present procedures (AP 1.22, Rev. 0) do not address when the list of controlled documents is to be updated. The proposed draft of AP 1.5 will require this list to be updated monthly. This monthly updating will not be effective as a method for document users to check if they are using the latest revision to a controlled document. As the design process progresses and design drawings are released for work activities, the number of controlled documents to track will become a large task. Considering future field design changes to these design drawings, a more appropriate design distribution and tracking system should be developed for the large projected number of design documents to be used on this project. If the design document user has access to an updated design document revision list, the use of an out-of-date procedure or drawing can be minimized.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date 6/22/87		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 87-4		3a Identified By G. Heaney		3b Branch Chief Concurrence Date N/A
5 Organization SAIC/T&MSS		6 Person(s) Contacted D. Belyea		4 SDR No. 046 Rev. 0
7 Response Due Date is 20 Working Days from Date of Transmittal				
8 Requirement (Audit Checklist Reference, if Applicable) NNWSI SOP-02-01, "OAPP Requirements for Participating Organizations and NTS Support Contractors", Rev. 1, Para. 16.1 states in part that (cont'd)				
9 Deficiency Contrary to the above requirement, corrective actions were not promptly implemented when it was identified that SAIC/T&MSS Administrative (cont'd)				
10 Recommended Action(s) <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1. Expedite the review/approval of AP 1.5 2. Provide the cause for the failure to implement corrective (cont'd)				

Aprvl.

11 GAE/Lead Auditor Date <i>7/15/87</i>	12 Branch Manager Date <i>7/8/87</i>	13 Project Quality Mgr. Date <i>7/15/87</i>
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Completed by Organization in Block 5

14 Remedial/Investigative Action(s)		15 Effective Date _____
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	GAE/Lead Auditor/Date	Branch Manager/Date
20 Amended Response <input type="checkbox"/> Accept <input type="checkbox"/> Reject	GAE/Lead Auditor/Date	Branch Manager/Date
21 Verifi- cation <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	GAE/Lead Auditor/Date	Branch Manager/Date
22 Remarks		

QA CLOSURE

23	GAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date
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WMPO STANDARD DEFICIENCY REPORT
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Block 8 REQUIREMENT (cont'd)

measures shall be established to ensure that conditions that are adverse to quality such as deficiencies, deviations and nonconformances are promptly identified and corrected. (Refer to Audit Checklist Item Nos. 5.0-9, 6.0-1.B, 6.02.A)

Block 9 DEFICIENCY (cont'd)

Procedure AP 1.22 "Issuance and Maintenance of Controlled Documents", Rev. 0, was not in compliance with existing Quality Program requirements. NCR WMPO-034 was initiated on June 17, 1986 identifying this deficiency. The corrective action commitment was to issue a new document control procedure AP 1.5 which was to supersede AP 1.22. This action was committed to be completed November 1, 1986. The procedure is still not yet approved.

The failure of getting AP 1.5 approved has developed other problems.

- 1) SAIC/T&MSS QA personnel generated NCR SAIC-014 identifying that other NNWSI participants do not have access to or authorization to use SAIC document AP 1.22 as it is not a project-wide document. Presently, there is no approved project-wide procedure for the use and control of NNWSI documents sent out by the Configuration Management Branch.
- 2) SAIC/T&MSS QA personnel generated NCR SAIC-015 identifying that AP 1.22 was inadequate to reflect current QA program requirements. QA provided Configuration Management with comments reflecting the inadequacies on May 21, 1986.
- 3) Additionally, form N-AD-033 "Document Transmittal Record" is presently being utilized to transmit documents. This form is contained in the draft of AP 1.5 at this time and therefore is not authorized to be used until the procedure is approved.
- 4) AP 1.5 has been referenced in SAIC/T&MSS procedures QP-5.1 and QP-6.1 since December 20, 1986 to provide document control instructions to users of these two procedures.

Block 10 RECOMMENDED ACTION (cont'd)

actions in a timely manner and specify measures to preclude recurrence.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date 6/22/87	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 87-4	3a Identified By T. Vetter	3b Branch Chief Concurrence Date N/A	4 SDR No. 048 Rev. 0
5 Organization SAIC/T&MSS	6 Person(s) Contacted J. Therien, R. Kettel		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) QP 10.2, Rev. 2 "Surveillances", Paragraph 5.4 requires the T&MSS QA Manager to transmit the surveillance report within five (5) working days. (cont'd)			
9 Deficiency For surveillances and audits noted below, the 5 working day and 30 day requirements were not satisfied. (cont'd)			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective Establish the necessary priorities to meet the scheduled dates.			

Completed by Organization in Block 5

11 GAE/Lead Auditor Date <i>[Signature]</i> 7/6/87	12 Branch Manager Date <i>[Signature]</i> 7/5/87	13 Project Quality Mgr. Date James B. Layford 7/15/87
14 Remedial/Investigative Action(s)		15 Effective Date
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"/> Reject	<input type="checkbox"/> Amended <input type="checkbox"/> 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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**V. APO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

N-QA-031
10/86

SDR No. 048

Rev. 0

Page 2 of 2

Block 8 REQUIREMENT (cont'd)

OP 18.2, Rev. 2, "Audits", Paragraph 5.6, requires the issuance of the approved audit report within 30 days from the completion of the audit.

Block 9 DEFICIENCY (cont'd)

<u>Audit/Surv. No.</u>	<u>Audit/Surv. Date</u>	<u>Dist. Date</u>	
SR 87-01	10/22/86	11/4/86	8 Working Days
SR 87-04	5/13/87	5/22/87	7 Working Days
IA-86-04	9/19/86	11/4/86	46 Days

(Refer to Audit Checklist Item No. 10.0-13 and 18.0-13)

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

15 Completed by Originating QA Organization	1 Date <u>6/22/87</u>		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 87-4		3a Identified By F. J. Ruth		3b Branch Chief Concurrence Date N/A
	4 SDR No. 049		Rev. 0		
	5 Organization SAIC/T&MSS		6 Person(s) Contacted Martin Jablonski		7 Response Due Date is 20 Working Days from Date of Transmittal
16 Completed by Organization in Block 5	8 Requirement (Audit Checklist Reference, if Applicable) The Quality Level Assignment Sheet for the SAIC/T&MSS Meteorological Monitoring Plan, Program Operation Activity, states in part that (cont'd)				
	9 Deficiency There is no objective evidence that an operator instruction manual exists. (refer to audit checklist Item No. 8.0-6)				
	10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1. Issue the Operators Instruction Manual. 2) Investigate and evaluate the possibility of additional deficiencies (cont'd)				
	11 QAE/Lead Auditor: Date <u>7/6/87</u>				
17 Completed by Org. QA Org.	12 Branch Manager Date <u>7/8/87</u>		13 Project Quality Mgr. Date <u>7/15/87</u>		
	14 Remedial/Investigative Action(s)				
	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 Response <input type="checkbox"/> Reject					
20 Amended Response <input type="checkbox"/> Accept <input type="checkbox"/> Reject					
21 Verifi- cation <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory					
22 Remarks					
23 QA CLOSURE					



U.S. APO STANDARD DEFICIENCY REPORT
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10/86

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Block 8 REQUIREMENT (cont'd)

" The specific duties to be carried out will be documented in an operator instruction manual, which will be written prior to the commencement of monitoring."

Block 10 RECOMMENDED ACTION

based on the lack of written instructions.

- 3) Determine the cause of the deficiency and specify measures to preclude recurrence.

WMPO STANDARD DEFICIENCY REPORT

N-0A-038
3/87

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

1 Date 6/22/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During MPO Audit 87-4		3a Identified By F. J. Ruth		3b Branch Chief Concurrence Date N/A	
5 Organization SAIC/T&MSS		6 Person(s) Contacted Martin Jablonski		7 Response Due Date is 20 Working Days from Date of Transmittal	

8 Requirement (Audit Checklist Reference, if Applicable)
The NNWSI Meteorological Monitoring Plan identifies the following requirements:
1) Paragraph 6.2, Page 6-1, Data Reporting Frequency and Content (cont'd)

9 Deficiency
1) Only the first quarterly report has been written covering the period December 1985 through January 1986. The second through the (cont'd)

10 Recommended Action(s): ☒ Remedial ☐ Investigative ☒ Corrective
1) Take appropriate actions to correct the specific conditions identified.
2) Identify the cause of the condition and the actions that will prevent recurrence.

11 QAE/Lead Auditor Date <i>[Signature]</i> 7/6/87	12 Branch Manager Date <i>[Signature]</i> 7/5/87	13 Project Quality Mgr. Date <i>[Signature]</i> 7/15/87
---	---	--

14 Remedial/Investigative Action(s)
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 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 Verification <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date	Branch Manager/Date

22 Remarks

QAE Lead Auditor Date Branch Manager Date PQM Date



WM 7 STANDARD DEFICIENCY REPORT
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N-QA-038
10/86

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Block 8 REQUIREMENT (cont'd)

states that "The quarterly reports will be prepared in draft form within 30 working days after the monitoring quarter ends. The annual reports will be prepared in draft form within 45 working days after each monitoring year ends."

2) Paragraph 6.2, Page 6-2 requires that All reports will provide an indication of progress to date, a review of all site activities during the period of record, problems encountered and their resolution, percentage data recovering rates, calibration, audit reports, and other pertinent information."

3) Paragraph 7.3 Independent System and Performance Audits, (Page 7-13): "The results of the independent performance audits will be presented in the annual monitoring reports as a measure of the accuracy of the monitoring data."

4) Paragraph 6.2, Page 6-2, states "The quarterly reports will include a description of the results of all quality assurance/quality control activities for the quarter."

Block 9 DEFICIENCY (cont'd)

fifth quarterly reports have not been written. In addition the annual report is not being prepared in draft form within 45 working days after each monitoring year ends. The monitoring year was from December 1985 through November 1986, no report has been written to date.

2) The monthly reports do not provide the required information.

3) No annual monitoring report has been written to document the results of the performance audits conducted to date.

4) The quarterly reports do not include a description of the results of all QA/QC activities for the quarter. They are contained, however, in ENV/DB-003-NNWSI-MMP-QA/QC documentation dated December 1985-February 1986. (Refer to Audit Checklist Item No. 8.0-5)

WMPO STANDARD DEFICIENCY REPORT

N-0A-03
3/87

1 Date 6/22/87 2 Severity Level ☐ 1 ☒ 2 ☐ 3 Page 1 of 2

3 Discovered During WMPO Audit 87-4 3a Identified By F. J. Ruth 3b Branch Chief Concurrence Date N/A 4 SDR No. 051 Rev. 0

5 Organization SAIC/T&MSS 6 Person(s) Contacted Martin Jablonski 7 Response Due Date 20 Working Days from Date of Transmittal

8 Requirement (Audit Checklist Reference, if Applicable)
The NNWSI Meteorological Monitoring Plan, Para. 7.3 Independent System and Performance Audits, (Page 7-13), states that "Within 60 days (cont'd)"

9 Deficiency
The independent system audits are not being conducted on a semi-annual basis but on a yearly basis. A system audit was conducted and documented (cont'd)

10 Recommended Action(s): ☒ Remedial ☒ Investigative ☒ Corrective
1. Conduct the required system audits.
2. Based on the results of the system audit, investigate to determine if the deficiency has allowed adverse conditions to exist and affect the data (cont'd)

11 QAE/Lead Auditor Date 7/7/87 12 Branch Manager Date 7/8/87 13 Project Quality Mgr. Date 7/15/87

14 Remedial/Investigative Action(s)
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 Verification	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date	Branch Manager/Date

22 Remarks

QAE/Lead Auditor/Date Branch Manager/Date PQM/Date



**V. MPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

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Block 8 REQUIREMENT (cont'd)

after monitoring stations have been brought on line and on a semi-annual basis thereafter, an independent system audit of the monitoring installation and operational activities will be conducted."

Block 9 DEFICIENCY (cont'd)

on 10/23/85 but there was no objective evidence that the monitoring equipment was brought on line prior to that date. (Refer to Audit Checklist Item No. 8.0-5)

Block 10 RECOMMENDED ACTION (cont'd)

collected to date.

3. Determine the cause of this deficiency and identify the actions necessary to prevent recurrence.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

Completed by Organization in Block 5

Comp. by Orig. QA Org.

1 Date 6/22/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During WMPN Audit 87-4		3a Identified By F. J. Ruth		3b Branch Chief Concurrence Date NA
4 SDR No. 052		Rev. 0		
5 Organization SAIC/T&HSS		6 Person(s) Contacted Martin Jablonski		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) The NNWSI Meteorological Monitoring Plan, Para. 7.2.1 Data Transmittal and Screening, (Page 7-8), states that "The digital data file will (cont'd)				
9 Deficiency These conditions are being identified on NNWSI Project Meteorological Monitoring Program Data Corrective Action Form and not as (cont'd)				
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1. Take actions to correct the deficiencies noted. 2. Examine the deficient condition to determine if other programmatic (cont'd)				
11 QAE/Lead Auditor Date <i>Con Thompson 7/6/87</i>		12 Branch Manager Date <i>W.R. Kapp 7/8/87</i>		13 Project Quality Mgr. Date <i>James Blayford 7/15/87</i>
14 Remedial/Investigative Action(s)		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 <input type="checkbox"/> 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	



WPMO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

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10/86

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Block 8 REQUIREMENT (cont'd)

be subjected to a screening process that identifies out of range conditions, e.g. either extremely high or negative wind speeds, extremely high or low temperatures or large hourly variations. Such nonconformances and corrective actions will be handled in accordance with the T&MSS QA Program procedures and written instructions."

Block 9 DEFICIENCY (cont'd)

nonconformances in accordance with the T&MSS QA Program. (Refer to Audit Checklist Item No. 8.0-5)

Block 10 RECOMMENDED ACTIONS (cont'd)

deficiencies may have been caused as a result.

3. Take action to identify the cause of the condition and to prevent recurrence.

WMPO STANDARD DEFICIENCY REPORT

N-OA-038
3/87

1 Date 6/22/87 2 Severity Level ☐ 1 ☐ 2 ☒ 3 Page 1 of 2

3 Discovered During WMPO Audit 87-4 3a Identified By R. Klemens 3b Branch Chief Concurrence Date N/A 4 SDR No. 053 Rev. 0

5 Organization SAIC/T&MSS 6 Person(s) Contacted D. Sternberg, Mae Cotter 7 Response Due Date is 20 Working Days from Date of Transmittal

8 Requirement (Audit Checklist Reference, if Applicable)
Section 17 of SAIC/T&MSS QAPP-1, Rev. 3, Para. 17.1, states that "Control of T&MSS QA Records (records) shall be described in QP 17.1". (Cont'd)

9 Deficiency
SAIC/T&MSS has implemented a project office information management system, including correspondence control, records management (Cont'd)

10 Recommended Action(s): ☒ Remedial ☐ Investigative ☐ Corrective
Actions should be taken to revise the SAIC/T&MSS QAPP-1 and Procedure QP 17.1 so that they are consistent with the latest revision of NNWSI NVO-196-17.

11 QAE/Lead Auditor Date *C.T. Thompson 7/28/87* 12 Branch Manager Date *W.K. Kiger 7/28/87* 13 Project Quality Mgr. Date *Jane Blaylock 7/28/87*

14 Remedial/Investigative Action(s) 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 Verification	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date	Branch Manager/Date

22 Remarks

23 Q4 CLOSURE QAE/Lead Auditor/Date Branch Manager/Date PQM/Date

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



WPMO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

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10/86

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Block 8 REQUIREMENT (cont'd)

QP 17.1, "QA Records", Rev. 2, Para. 1.0, states in part, "This procedure implements the requirements of NNWSI-SOP-17-01, Rev. 0, and describes the Technical and Management Support Services (T&MSS) Quality Assurance records management process and controls."

Block 9 DEFICIENCY (cont'd)

and QA records, in accordance with administrative procedure 6.1 and IMS Procedure 3. These procedures address all project-related documents and are not consistent with QP 17.1 or NNWSI-SOP-17-01, which apply only to quality assurance records. There is no evidence that these SAIC/T&MSS quality documents have been replaced or rescinded.



Department of Energy

Nevada Operations Office

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JUL 12 1987

Richard L. Bullock
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Las Vegas, NV 89193-3265

WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) AUDIT 87-9 OF
FENIX & SCISSON (F&S) SUPPORT OF THE NEVADA NUCLEAR WASTE STORAGE
INVESTIGATIONS (NNWSI) PROJECT (WMPO ACTION ITEM #87-2382)

Enclosed is the report for QA Audit 87-9, which was conducted for the WMPO at
F&S in Las Vegas on July 14-17, 1987.

The audit reviewed sufficient objective evidence related to the F&S Quality Assurance Program Plan (QAPP) to confirm that the F&S program is in general compliance with the NNWSI Project Quality Assurance Plan NVO-196-17, Rev. 3. The distribution of the deficiencies, however, indicates the need for increased management attention to the preparation and revision of procedures so that they properly reflect the NNWSI Project requirements. Deficiencies are described in Section 6.0 of this report.

During the course of the audit, the audit team generated four Standard Deficiency Reports (SDRs) (Nos. 058-061), four observations, and one recommendation. The action copies of the SDRs were transmitted to you by the WMPO letter JB-2521 on August 11, 1987. Copies of the SDRs are also enclosed with this report for your information.

Written responses to the four observations contained in Section 6.0 are required and are due within 20 working days of the date of this transmittal letter. Please address your responses to me and concurrently send a copy of each observation response to Nita J. Brogan, Science Applications International Corporation, Las Vegas, Nevada.

The recommendation contained in this audit report is submitted for consideration by your staff during the implementation of your QAPP.

By copy of this letter, Audit 87-9 is considered closed. Any open SDRs or observations will continue to be tracked by the WMPO until all have been satisfactorily closed.

WMPO QUALITY ASSURANCE AUDIT REPORT
NNWSI AUDIT OF FENIX & SCISSON, LAS VEGAS, NEVADA

AUDIT NUMBER: 87-9

CONDUCTED ON: JULY 14-17, 1987

PREPARED BY: RH Klemens DATE: 8/26/87
Lead Auditor

APPROVED BY: W. R. Kagon DATE: 8/26/87
Manager, Audits & Surveillances

APPROVED BY: James B. Blylock DATE: 8/28/87
PQM (WMPO)

1.0 Introduction

This report contains the results of the WMPO QA Audit of Fenix & Scisson, Las Vegas/ Nevada Test Site. The audit was conducted July 14-17, 1987, in accordance with the WMPO Quality Assurance Program Plan.

2.0 Audit Scope

The purpose of the audit was to evaluate the effectiveness of the F&S Quality Assurance Program with respect to the requirements of NNWSI Project Quality Assurance Plan, NVO-196-17, Rev. 3, and to verify the implementation of the Quality Assurance Program as it relates to activities on the NNWSI Project.

3.0 Audit Team Personnel

The audit team consisted of the following members:

Lead Auditor: Robert H. Klemens, SAIC, Las Vegas, Nevada
Auditors: Gerard Heaney, SAIC, Las Vegas, Nevada
Frederick J. Ruth, SAIC, Las Vegas, Nevada
W. R. Marchand, DOE/HQ (Weston)

4.0 Summary of Audit Results

Evaluation of the F&S Quality Assurance Program and selected tasks indicates general compliance with NNWSI Project NVO-196-17, Rev. 3 requirements. Four deficiencies were identified during the course of the audit. The team also generated four observations and one recommendation. The deficiencies, which have been entered on Standard Deficiency Reports (SDRs), and also the observations and recommendations are delineated in Section 6.0 of this audit report.

Within the scope of this audit, the following program elements of the F&S Quality Assurance Program Plan were found to be in compliance with the NNWSI Project Quality Assurance Program requirements:

- 1.0 Organization
- 5.0 Instructions, Procedures & Drawings
- 6.0 Document Control
- 16.0 Corrective Action
- 18.0 Audits

Certain program elements were not audited at this time because they have not as yet been implemented. These are:

- 3.0 Design Control
- 4.0 Procurement Document Control
- 7.0 Control of Purchased Material, Equipment & Services
- 8.0 Identification & Control of Items
- 9.0 Control of Special Processes
- 10.0 Inspection
- 11.0 Test Control
- 12.0 Control of Measuring & Test Equipment
- 13.0 Handling, Storage, & Shipping
- 14.0 Inspection, Test, and Operating Status

Program elements which the audit team identified as being deficient were:

- 2.0 QA Program
- 15.0 Control of Nonconforming Items
- 17.0 QA Records

The deficiencies were qualified by the application of severity levels which are related to the significance of the finding. A discussion of the SDR severity levels is provided in Enclosure 1. All four of the SDRs were classified as severity level 2.

The observations identify conditions that are presently not a violation of procedural requirements, but, in the opinion of the audit team, could lead to a violation of requirements in the future. The observations were in the programmatic areas of document control, procedure review, surveillances, and personnel certifications. The recommendation was in the programmatic area of document control.

The audit team also reviewed F&S implementation of the following specific tasks:

- o Site Characterization (WBS 1.2.3)
- o Exploratory Shaft Facility Studies (WBS 1.2.6)
- o Administration & Project Control (WBS 1.2.9)

The Site Characterization task was identified as the F&S Geologists support to USGS at NTS and was a Quality Level III task. The Exploratory Shaft Facility studies were prepared by F&S, Tulsa, and will be audited in the WMPD Audit 87-8 of F&S, Tulsa. The studies are approved by the TPO in the Las Vegas office as an administrative function, but all of the design work is done in Tulsa. The program element review included Administration and Project Control.

5.0 Audit Meetings

5.1 Preaudit Conference

A preaudit conference was held on July 14, 1987 at 10:00 a.m. The purpose, scope and agenda of the audit were reviewed with the F&S, Las Vegas Project Management staff. The audit team members and assigned counterparts were identified and lines of communication were established. (See Enclosure 2 for attendees)

5.2 Postaudit Conference

The postaudit conference was held on July 17, 1987 at 10:00 a.m. The results of the audit, including the deficiencies, observations and recommendations identified during the course of the audit were presented to the F&S staff. Rough draft copies of the SDRs, observations, and recommendations were provided to F&S Management at this time. (See Enclosure 3 for attendees)

6.0 Synopsis of SDRs/Observations/Recommendations

6.1 Standard Deficiency Reports

o SDR NO. 058 - Severity Level 2

Project Procedure PP-40-03 does not contain the requirement that the work order scope should include the Technical and Quality requirements of the work request or criteria letter.

o SDR No. 059 - Severity Level 2

QAP-2-2 (N), "Indoctrination & Training of QA Personnel" does not describe the training required for QA surveillance personnel.

o SDR NO. 060 - Severity Level 2

QAP15.2N does not adequately describe the application and removal of the Discrepant Item Tag and does not contain an exhibit of the Tag.

o SDR NO. 061 - Severity Level 2

Failure to turn over NNWSI Project QA Records to Central Files for indexing into the QARMS data base. F&S Personnel Qualification Records are retained in the Personnel Department.

6.2 Observations

Observation No. 1

During review of document control activities, it was observed that F&S procedures do not require that new or revised NNWSI Project Procedures (i.e. Standard Operating Procedures, Administrative Procedures etc.) be reviewed for possible impacts on F&S project implementing procedures. It was observed during the audit however, that this type of review is actually being performed by F&S personnel. This activity should be documented within the F&S Quality Assurance Program.

Observation No. 2

During review of Project Procedure (PP) history files for F&S Procedures PP-10-02, Rev. 0, NNWSI-PP-01, Rev. 0, and NNWSI-PP-03, Rev. 0, it was observed by the audit team that review/comment sheets for these procedure revisions did not contain the revision number. However, a copy of the procedure reviewed was attached to the review/comment sheet. Further review of the procedures for review and approval of procedures (specifically PP-10-01, Rev. 1, Para. 6.1.2 and QAP-2.3(N), Rev. 1, Para. 4.1.3) indicates that there is no specific instruction given for the review and resolution of comments generated during a procedure review. The form used for review/comment of procedures (LV-234) does not contain a revision block or a block that indicates resolution and acceptance of comments. The audit team believes that these two important characteristics of a procedure review should be specifically included either in the text of the procedure or on the review/comment form itself.

Observation No. 3

SOP-02-01, Rev. 0, Section 18.0 Audits, Paragraph 18.1.2 states, "The audit program shall be supplemented by random surveillances made by persons independent of the activity."

This requirement is not in the QAPP, but it is in QAP-18.1 (N), Rev. 2 which states that follow-up audits or surveillances shall be performed to verify implementation of corrective action as stated on the Audit Deficiency Report but does not indicate that surveillances are used to supplement the audit program.

There is no surveillance procedure at this time, but this deficiency was previously reported in F&S Internal Audit Number QA(N)-87-02, audit deficiency report number QA(N)-87-02-4.

Observation No. 4

During review of personnel certifications, it was observed that the Project Design Manager signed his own certification and recertifications. The audit team recommends that this practice be discontinued and that the Project Design Manager be recertified by his manager.

6.3 Recommendations

Recommendation No.1

Procedure PP-10-01, Rev. 1, Paragraph 6.5 discusses distribution and maintenance of PP procedures which is a document control activity. During the audit, a draft copy of a new procedure P-10-03 "NNWSI Project Office Procedure for Handling Correspondence and Documents" was shown to the audit team. Paragraphs 6.4 and 6.5 of this new procedure discuss the handling of controlled documents which is also a document control activity. It is recommended that the paragraphs contained in these two procedures be combined into one procedure. The use of one procedure for the control of documents would avoid confusion as to which procedure one should use to transmit and control documents. Additionally, using one procedure would avoid any conflicts that may occur between the two procedures during future revisions.

7.0 Required Action

Written responses are required for each Standard Deficiency Report identified in Section 6.0. Copies of these SDRs were forwarded to F&S on August 11, 1987 along with instructions which stated that responses to the SDRs are due within 20 working days of the date of the transmittal letter. Upon WMPD acceptance of F&S responses and satisfactory completion of all remedial and corrective actions, the SDRs will be closed and F&S will be notified by letter of the SDR closure.

A written response is also required for each observation contained within Section 6.0. Responses are due within 20 working days of the date of the transmittal letter for this audit report.

Written responses are not required for the recommendations contained within Section 6.0. The recommendations were generated by the audit team for consideration by the F&S staff during implementation of the Quality Assurance Program.

SEVERITY LEVELS

Severity Level 1 - Significant deficiencies considered of major importance. These deficiencies require remedial, investigative, and corrective actions to prevent recurrence.

Severity Level 2 - A deficiency which is not of major importance, but may also require remedial, investigative, and/or corrective action to prevent recurrence.

Severity Level 3 - A minor deficiency in that only remedial action is required. These deficiencies are generally isolated in nature or have a very limited scope. In addition, the integrity of the end result of the activity is not affected nor does the deficiency affect the ability to achieve those results.

Remedial Action - Actions taken to correct the specific deficiencies noted on the SDR.

Investigative Action - Actions taken to further examine the deficient condition to determine the extent and depth. This action should identify all conditions similar to the examples listed on the SDR.

Corrective Action - Actions taken to identify the cause of the condition and to prevent recurrence of the condition identified on the SDR.

F&S
Las Vegas

Audit 87-9
July 14, 1987

PREAUDIT CONFERENCE

<u>Name</u>	<u>Title</u>	<u>Organization</u>	<u>Location</u>
M. J. Regenda	Dir. of QA	F&S	Mercury, NV
R. L. Bullock	Proj. Mgr/TPO	F&S	Las Vegas, NV
T. E. Goebel	Drlg. Mgr./NNWSI	F&S	Las Vegas, NV
M. H. Wilson	Admin. Mgr.	F&S	Las Vegas, NV
W. B. Mansel	QA Engr.	F&S	Mercury, NV
P. K. Ortego	Operations Mgr.	F&S	Mercury, NV
D. J. Tunney	QA Engr.	F&S	Mercury, NV
W. R. Marchand	QA Engr. Auditor	Weston/DOE	Washington, DC
F. J. Ruth	QA Engr.	SAIC/QASC	Las Vegas, NV
G. Heaney	QA Engr	SAIC/QASC	Las Vegas, NV
R. H. Klemens	QA Engr	SAIC/QASC	Las Vegas, NV

F&S
Las Vegas

Audit 87-9
July 17, 1987

POST AUDIT CONFERENCE

<u>Name</u>	<u>Title</u>	<u>Organization</u>	<u>Location</u>
Jerry Heaney	QA Engr.	SAIC	Las Vegas, NV
R. H. Klemens	QA Engr.	SAIC	Las Vegas, NV
R. L. Bullock	NNWSI Proj. Mgr.	F&S	Las Vegas, NV
D. J. Tunney	QA Engr.	F&S	Mercury, NV
Matt Wilson	Admin. Mgr.	F&S	Las Vegas, NV
Jack A. Cross	VP & Gen. Mgr.	F&S	Las Vegas, NV
T. E. Goebel	NNWSI Mgr. Drlg.	F&S	Las Vegas, NV
M. J. Regenda	Dir. of QA	F&S	Mercury, NV
P. K. Ortego	Operations Mgr.	F&S	Mercury, NV
F. J. Ruth	QA Engineer	SAIC	Las Vegas, NV
C. M. Thompson	QA Engineer	SAIC	Las Vegas, NV

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date 7/17/87 2 Severity Level ☐ 1 ☒ 2 ☐ 3 Page 1 of 2

3 Discovered During 3a Identified By 3b Branch Chief
WMPO Audit 87-9 W. Marchand N/A
4 SDR No 059 Rev 0

5 Organization Fenix & Scisson, Inc. 6 Person(s) Contacted M. Regenda 7 Response Due Date is 20 Working Days from Date of Transmittal

8 Requirement (Audit Checklist Reference if Applicable) Checklist No. 87-9-1, Item 2.0-1b, 5 NNWSI SOP-02-01, Rev. 0, Paragraph 5.1.1, states in part, "Activities that affect quality shall be prescribed by documented instructions and procedures of a type appropriate to the circumstances and shall be accomplished in accordance (cont'd)

9 Deficiency Contrary to the above, F&S Quality Assurance Procedure QAP-2.2(N), "Indoctrination and Training of Quality Assurance Personnel," Rev. 1, does not describe the training required for Quality Assurance personnel performing surveillances (cont'd)

10 Recommended Action(s) ☒ Remedial ☐ Investigative ☒ Corrective

1) Revise QAP 2.2(N) to include specific training requirements for QA surveillance personnel. Train QA surveillance personnel to the requirements to be included in the revision of QAP-2.2(N).

11 QAE/Lead Auditor Date 7/24/87 12 Branch Manager Date 7/24/87 13 Project Quality Mgr Date 7/30/87
B.H. Klemens W. Marchand James Blaylock

14 Remedial/Investigative Action(s) 15 Effective Date

16 Cause of the Condition & Corrective Action to Prevent Recurrence 17 Effective Date

18 Signature/Date

19 Response ☐ Accept ☐ Amended Response ☐ Reject QAE/Lead Auditor/Date Branch Manager/Date
20 Amended Response ☐ Accept ☐ Reject QAE/Lead Auditor/Date Branch Manager/Date
21 Verification ☐ Satisfactory ☐ Unsatisfactory QAE/Lead Auditor/Date Branch Manager/Date

22 Remarks

23 QA CLOSURE QAE/Lead Auditor/Date Branch Manager/Date PQM/Date

Comp. by Orig. QA Org.



**WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

**N-QA-038
10/86**

SDR No 059

Rev

Page 2 **of** 2

Requirement (cont'd)

with these instructions and procedures.

Deficiency (cont'd)

NOTE: The procedure does describe education and experience requirements as well as physical requirements for the position.

WMPO STANDARD DEFICIENCY REPORT

N-0A-038
3/87

Completed by Originating QA Organization

1 Date 7/15/87		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During Audit 87-9		3a Identified By F. Ruth		3b Branch Chief Concurrence Date N/A
4 SDR No 060		Rev 0		
5 Organization Fenix & Scisson, Inc.		6 Person(s) Contacted D. Tunney		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference if Applicable) Checklist 87-9 - Item No. 15.0-2, Page 16 of 36 QAPP-002, Rev. 1, Para. 15.1 and QAP-15.2(N), Rev. 1, Para. 5.4 (cont'd)				
9 Deficiency 1) The QAPP and the QAP do not give enough detail as to the application and removal of the Discrepant Item Tag. 2) There is no exhibit of the (cont'd)				
10 Recommended Action(s) <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1) Revise QAP-15.2(N) to describe the application and removal of the Discrepant Item Tag. (cont'd)				

Approved

11 QAE/Lead Auditor Date R. H. Klemm 7-30-87	12 Branch Manager Date W. R. Kegan 7-30-87	13 Project Quality Mgr Date James Blaylock 7/30/87
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Completed by Organization in Block 5

14 Remedial/Investigative Action(s)		15 Effective Date
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 Verification <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



WMPO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

N-QA-03E
10/8E

SDR No. 060

Rev 0

Page 2 of 2

Requirement (cont'd)

identify the use of a Discrepant Item Tag (DIT) to be attached to nonconforming items which will be segregated pending disposition of the nonconformance.

Deficiency (cont'd)

DIT in the procedure. 3) QAP-15.2(N), Rev. 1, Para. 5.4 identifies the DIT as form LV-192A but in fact that is the Nonconformance Report.

Recommended Action (cont'd)

- 2) Place an exhibit of the Discrepant Item Tag at the back of the procedure.
- 3) Change QAP-15.2(N), Rev. 1, Para. 5.4 to properly identify the form number of the Discrepant Item Tag.

WMPO STANDARD DEFICIENCY REPORT

N-0A-038
3/87

Completed by Originating QA Organization

1 Date 7/17/87		2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During WMPO Audit 87-9	3a Identified By B. Klemens	3b Branch Chief Concurrence Date N/A	4 SDR No 061 Rev 0	
5 Organization Fenix & Scisson, Inc.	6 Person(s) Contacted B. Graves, R. Bullock, P. Bolling		7 Response Due Date is 20 Working Days from Date of Transmittal	

8 Requirement (Audit Checklist Reference if Applicable)
QAP-17-1, Rev. 0, Para. 4.0, and TESOP-004-02, Rev. 0, Para. 7.0, require NNWSI QA Records to be indexed into the QARMS database.

9 Deficiency
Contrary to the above, F&S Personnel Qualification (Certification) Records are retained by their Personnel Department and not turned over to Central Files for indexing into the QARMS database.

10 Recommended Action(s) ☒ Remedial ☐ Investigative ☐ Corrective
1) Comply with above requirements. As an alternative, F&S could provide Central Files with a certificate stating that the individual has been certified but due to circumstances the backup records are filed in the (cont'd)

11 QAE/Lead Auditor Date <i>R.H. Klemens</i> 7/30/87	12 Branch Manager Date <i>W. K. Kegan</i> 7/30/87	13 Project Quality Mgr Date <i>James B. Blythe</i> 7/30/87
---	--	---

14 Remedial/Investigative Action(s)	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 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 Verification <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

Comp. by Orig. QA Org.



**WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET**

N-0A-031
10/86

SDR No 061

Rev.

Page 2 of 2

Recommended Action (cont'd)

personnel office.

2. Revise QAP-17-1 and TESOP-004-03 accordingly to reflect action taken.

N-DA-03E
3/87

N-DA-03E
3/87

WMPO STANDARD DEFICIENCY REPORT		N-0A-03E 3/87	
1 Date 7/17/87		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 87-9	3a Identified By G. Heaney	3b Branch Chief Concurrence Date N/A	4 SDR No 058 Rev C
5 Organization Fenix & Scisson, Inc.	6 Person(s) Contacted S. Murphy		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference if Applicable) Checklist 87-9-2, Item T-10 NNWSI SOP-03-01, "Engineering, Construction and Support Service at the NTS," Rev. 0, Paragraph 5.3.1 states in part, "The work order scope shall include reference to the Technical and Quality requirements of the criteria letter (cont'd)			
9 Deficiency Contrary to the above, F&S Procedure PP-40-03, "Procedure for Making and Issuing Work Orders for NNWSI Projects at NTS" does not contain this requirement.			
10 Recommended Action(s) <input type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective 1) Revise PP-40-03 to include requirements contained in Block 8. 2) Instruct appropriate personnel to revised procedural requirements. 3) Determine if omission of the requirement from the procedures has impacted (cont'd)			
11 QAE/Lead Auditor Date R.H. Klemens 7-30-87	12 Branch Manager W.R. Kagan 7-30-87	13 Project Quality Mgr Date James Blaylock 7/30/87	
14 Remedial/Investigative Action(s)		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 checked="" type="checkbox"/> Reject <input type="checkbox"/> Response	QAE/Lead Auditor/Date		Branch Manager/Date
20 Amended Response <input type="checkbox"/> Accept <input checked="" type="checkbox"/> Reject	QAE/Lead Auditor/Date		Branch Manager/Date
21 Verification <input type="checkbox"/> Satisfactory <input checked="" type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date		Branch Manager/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date



WPMO STANDARD DEFICIENCY REPORT CONTINUATION SHEET

N-QA-03E
10/86

SDR No 058

Rev. 0

Page 2 of 2

Requirement (cont'd)

or work request."

Recommended Action (cont'd)

any Quality Assurance Level I or II work requested on previously generated work orders.

SEP 01 1987

Richard L. Bullock

-2-

If you have any questions, please contact Robert Klemens of SAIC at 295-8734.

James Blaylock

James Blaylock
Project Quality Manager
Waste Management Project Office

WMPO:JB-2641

Enclosure:
Report for QA Audit 87-9

cc w/encl:

V. J. Cassella, HQ (RW-222) FORS
J. P. Knight,, HQ (RW-24) FORS
J. A. Cross, F&S, Las Vegas, NV
M. J. Regenda, F&S, Mercury, NV
S. H. Klein, SAIC, Las Vegas, NV
W. R. Kazor, SAIC, Las Vegas, NV
R. H. Klemens, SAIC, Las Vegas, NV
N. J. Brogan, SAIC, Las Vegas, NV
B. A. Wozniak, SAIC, Las Vegas, NV
P. T. Prestholt, NRC, Las Vegas, NV
V. F. Witherill, NTSO, NV
A. R. Veloso, NTSO, NV
R. W. Gray, MED, NV
J. R. Rinaldi, QAD, NV
L. P. Skousen, WMPO, NV
M. B. Blanchard, WMPO, NV



Department of Energy

Nevada Operations Office

P. O. Box 98518

Las Vegas, NV 89193-8518

SEP 01 1987

Michael E. Spaeth
Technical Project Officer
for NNWSI
Science Applications International Corporation
The Valley Bank Center
101 Convention Center Drive
Suite 407
Las Vegas, NV 89109

WASTE MANAGEMENT PROJECT OFFICE (WMPO) NONCONFORMANCE REPORT (NCR) WMPO-035

Reference: Letter, Spaeth to Vieth, dtd. 2/12/87

Please be advised that the WMPO has reviewed Administrative Procedure AP-3.15, Revision 1, "T&MSS Verification of Information on Education and Experience," submitted by the above referenced letter and concurs with the procedure as written. As a result, NCR WMPO-35 has been closed. A copy of the NCR is enclosed for your records.

If you have any questions, please contact me at FTS 295-1125.

James Blaylock
Project Quality Manager
Waste Management Project Office

WMPO:JB-2639

Enclosure:
Nonconformance Report

cc w/encl:

V. J. Cassella, HQ (RW-222) FORS
J. P. Knight, HQ (RW-24) FORS
M. I. Foley, SAIC, Las Vegas, NV
J. R. LaRiviere, SAIC, Las Vegas, NV
E. W. McCann, SAIC, Las Vegas, NV
S. H. Klein, SAIC, Las Vegas, NV
W. R. Kazor, SAIC, Las Vegas, NV
N. J. Brogan, SAIC, Las Vegas, NV
C. M. Thompson, SAIC, Las Vegas, NV
P. T. Prestholt, NRC, Las Vegas, NV
R. W. Gray, MED, NV
J. R. Rinaldi, QAD, NV

NONCONFORMANCE REPORT

7/85

PART I - INTIATION

Originator/Organization Sandy Williams/SAIC, QASCAssigned Quality Assurance Level _____ NCR No. WMPO-35 NCR Date June 1, 1986Nonconforming Item or Activity and Responsible Organization Verification of Education and Experience for NNWSI Project dedicated personnel/SAICSpecification/Drawing/Procedure Requirements SAIC Policy/Procedure B-3Deficiency SAIC Policy/Procedure B-3 does not require verification of past experience in Section 5.0 and 6.0, but does in Section 3.0.

PART II - PERSON/ORGANIZATION ASSIGNED DISPOSITION RESPONSIBILITY

W. Devlin / T. MSS

PART III - DISPOSITION

☐ Repair☒ Rework☐ Use-as-is☐ Reject/Scrap

Describe Technical Justification and Assignment of Responsibility A T&MSS Administrative Procedure (AP 3.15, T&MSS Verification of Information on Education and Experience) will be finalized by 9/18/86 to comply with NNWSI requirements. AP 3.15 will be submitted to WMPO for approval, after which it will replace procedure B-3 in the T&MSS QAPP and Supporting Documents Manual. The T&MSS Project Management Support Division is responsible for preparing AP 3.15. The cause of the nonconformance is that B-3 is a SAIC Corporate level document that was not written to comply with the NNWSI requirements.

Approvals of Disposition

Dispositioner/Date William D. Davis 9/23/86 Dispositioner/Date _____Project QA/Date John D. Smith 9/23/86 WMPO/TSO/Date N/ADisposition Action Complete Date William D. Davis 9/29/86

PART IV - VERIFICATION (Approved Disposition Verified and Examined)

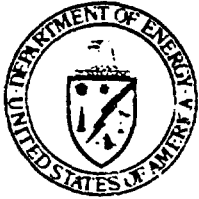
☒ Accept☐ Reject

New NCR No. _____

Project QA/Date 8/5/87Comments AP 3.15, Rev-0, issued 9/15/86.Approved by WMPO 12/3/86 - Letter, JB-493AP 3.15, Rev-1 approved 8/5/87

ENCLOSURE

Page of



Department of Energy

Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

SEP 01 1987

Larry R. Hayes
Technical Project Officer
for NNWSI
U.S. Geological Survey
Mail Stop 421
P.O. Box 25406
Denver, CO 80225

WASTE MANAGEMENT PROJECT OFFICE (WMPO) QUALITY ASSURANCE (QA) AUDIT 86-2 OF
U.S. GEOLOGICAL SURVEY (USGS) SUPPORT OF THE NEVADA NUCLEAR WASTE STORAGE
INVESTIGATIONS (NNWSI) PROJECT

Reference: Ltr, Blaylock to Hayes, dtd. 8/7/87

Please be advised that based on the results of WMPO Surveillance Report No. WMPO-SR-87-018, transmitted by the above referenced letter, Audit Findings Nos. 862a-3, 6, 7, 9, 14, and 21 from the subject audit have been closed. Copies are enclosed for your records. As of this date, AFS Nos. 862a-5, 16, and 22 from the audit still remain open pending completion of the corrective actions by USGS and verification by the WMPO.

If you have any questions, please contact me at FTS 575-8913.

James Blaylock
Project Quality Manager
Waste Management Project Office

WMPO:JB-2634

Enclosure:
Audit Findings

cc w/encl:

V. J. Cassella, HQ (RW-222) FORS
J. P. Knight, HQ (RW-24) FORS
J. R. Willmon, USGS, Denver, CO
J. A. Pattilo, LANL, Los Alamos, NM
S. H. Klein, SAIC, Las Vegas, NV
C. M. Thompson, SAIC, Las Vegas, NV
W. R. Kazor, SAIC, Las Vegas, NV
F. J. Ruth, SAIC, Las Vegas, NV
P. T. Prestholt, NRC, Las Vegas, NV
R. W. Gray, MED, NV
M. B. Blanchard, WMPO, NV
L. P. Skousen, WMPO, NV
W. R. Dixon, WMPO, NV





WMPO AUDIT FINDING SHEET (AFS)

N-QA-0:
6/85

(To be used for all AFSs with added sheets as required)

Audit Finding No. 862a-3 Audited Checklist Reference 862a-1-4.2.2

Audited Organization USGS - Denver

Organization Unit QA Activity Procurement Doc. Control

Response Assigned To W. W. Dudley, Jr. Reported By (Auditor) N. Voltura/S. Singer

Requirement (Cite) NNWSI-USGS-QMP-4.01, Rev. 0 states: Para. 1: Purpose: "To establish controls for ensuring that requisition documents include the applicable statements, re
ences or clauses to obtain procurement objectives for NNWSI Project related (cont'd)

Finding Contrary to the above, a sample review of procurement documents identified inco
sistent implementation of USGS-QMP-4.01 in the following areas: (1) neither the pur
chase requisition nor the NNWSI QA Procurement Form consistently identify any of the
following for QA Level I items or services: technical requirements, QA Program (cont'

Approved By LA S. Singer 4/2/86 Response Due Date 30 days after
4/10/86 Receipt of Report

Approved By WMPO/NV James Blaylock 4/10/86 Date _____

Response (To be completed by audited organization) 1. Contrary to the statement of this
finding, the procedure for procurement control, QMP-4.01 does include all the require
ments listed including technical requirements, QA Program requirements, Rights of
access, Documentation requirements, and provision for reporting nonconformances.
These items are specifically listed on Attachment 1 which by procedure is to (cont'd)

Implementation Date Approx 11/01 Submitted By W. W. Dudley, Jr. Date 5/11/86

To be completed by lead auditor (LA) and reviewed by WMPO/NV

Corrective Action Response

☒ Satisfactory ☐ Unsatisfactory

Reviewed by LA/Date S. Singer 10/30/86

Reviewed by WMPO/NV/Date James Blaylock 11/1/86

Corrective Action Implementation

☒ Satisfactory ☐ Unsatisfactory

Reviewed by LA/Date W. R. Kagan 6/30/87

Reviewed by WMPO/NV/Date James Blaylock 6/30/87

Reaudit Date _____

Remarks Ref Wm Po SR NO 87-018

Audit Finding Closed ☒ LA Concurrence/Date W. R. Kagan 6/30/87

Reference and Number(s) for unsatisfactory reaudit _____

ENCLOSURE

WMPO Audit Finding No. 862a-3 cont'd

Req. cont'd

services, activities or items." Para. 4.3 states in part: "Level I items/services -- In addition to 4.1 and 4.2, requisition documents shall include provisions as deemed necessary and applicable by the purchaser for the following: Technical requirements . . . , QA Program requirements . . . , Rights of Access . . . , Documentation Requirements . . . , Nonconformance reporting requirements"

Para. 5.3 "QA Manager reviews & approves the requisition & QA Procurement forms Copies of the requisition documents for Level I items/services are forwarded to . . . WMPO"

Finding cont'd

requirements, Rights of access, Documentation requirements, provisions for reporting nonconformances. Requisition #s - 4810-0116, 1/14/86; 4810-0041-86, 10/1/85; 4810-0109-86, 1/8/86; 4810-33310T, 12/27/85; 4810-0088, 12/17/85. (2) Lack of documented evidence of USGS' QA Manager's review and approval of the requisition and the QA Procurement form. Requisition #4810-0017-86, 9/18/85; #4810-0015-86, 8/20/85; #4810-0007-86, 8/85. (3) USGS personnel have approved the USGS NNWSI QA Procurement form for the USGS QA Manager without documented authority to do so. (4) Copies of all as-issued QA Level I procurement documents are not being forwarded to WMPO.

USGS Audit Findings Response (continued)

be attached to the requisition form of Attachment 2. There was no mention made of the presence of Attachment 1, but it apparently was missing and the auditors reviewed only the requisition form (Attachment 2) which did not contain all the necessary details. During the time leading to the audit, insufficient staff prevented the detailed supervision required to assure full compliance with this procedure resulting in the deficiency observed in the audited requisitions. This problem will be corrected by the assignment of a full-time QA staff member who's assignment will be in place prior to terminating the stop-work order.

2. Provision for evidence of the QA Manager's review was made in QMP-4.01, R0, however, it is apparent that this signature was not affixed as required on the documents audited. This deficiency has been corrected by revision of the procedure to have the document pass through the Chief, Branch of NNWSI, or his designee, for signature before being processed, and by the thorough QA check of the full-time QA staff member for procurement as stated in no. 1 above.
3. Because of the distribution of the USGS participants in the NNWSI Program, it is necessary to delegate signature authority. The deficiency here lies in the absence of overt evidence that the authority was delegated. This deficiency will be corrected by the QA Manager issuing a letter of authority to appropriately assigned, skilled and trained personnel.
4. This deficiency stems partly from the confusion over the assignment of levels to many of the detailed tasks in the various activities of the program which should be alleviated with the levels assignments which will be completed prior to going back to work. This deficiency should be corrected through the dedicated attention of the QA Procurement Specialist as mentioned above in item 1.



WPMO AUDIT FINDING SHEET (AFS)

N-QA-6/85

(To be used for all AFSs with added sheets as required)

Audit Finding No. 862a-6 R-1 Audited Checklist Reference 862a-1 Page 7 o

Audited Organization USGS

Organization Unit Various Activity Indoctrination & Training

Response Assigned To W. W. Dudley, Jr. Reported By (Auditor) J. W. Estella

Requirement (Cite) NNWSI-USGS-QMP-2.02, Rev. 0, paragraph 4.1 requires that all personnel performing quality related activities receive indoctrination and training to the extent necessary to perform their specific functions. Paragraph 4.2 states that the (cont'd)
Finding Contrary to the above cited requirement, there is no documentation of indoctrination and training of USGS personnel performing quality related activities. It should also be noted that there is no apparent central control or accountability of the USGS personnel working on the NNWSI Project to ensure that these personnel are (cont'd)

Approved By LA A. Singer 4/8/86 Response Due Date 30 days after Receipt of Report
Approved By WPMO/MV Jane Blaylock 1/10/86 Date

Response (To be completed by audited organization) The USGS admits to the seriousness of this deficiency which resulted from inadequate staff who were struggling to meet the broad basic aspect of the overall QA Program. We believe that the issue of "apparent control or accountability... to ensure personnel are properly indoctrinated, (cont'd)

Implementation Date 3/31/87 Submitted By A. Singer Date 1/6/87

To be completed by lead auditor (LA) and reviewed by WPMO/MV

Corrective Action Response

☒ Satisfactory ☐ Unsatisfactory

Reviewed by LA/Date A. Singer 1/20/87

Reviewed by WPMO/MV/Date Jane Blaylock 1/24/87

Corrective Action Implementation

☒ Satisfactory ☐ Unsatisfactory

Reviewed by LA/Date W. W. Dudley 6/30/87

Reviewed by WPMO/MV/Date Jane Blaylock 6/30/87

Reaudit Date

Remarks Re: A. WPMO. SR No 87018

Audit Finding Closed ☒ LA Concurrence/Date W. W. Dudley 6/30/87

Reference and Number(s) for unsatisfactory reaudit

WMPO Audit Finding No. 862a-6 cont'd

Req. cont'd

indoctrination and training activities shall be documented and retained as a QA record.

Finding cont'd

properly indoctrinated, trained, and certified.

USGS Audit Findings Response (continued)

trained, and certified" has been addressed in QMP-2.02, R1, and QMP-2.03, R1. A formal program on QA training for all USGS Project participants, including a thorough introduction to and presentation of the latest approved QAPP and its incorporated QMPs, has been prepared and training will begin the first week of January 1987.

00330



WMPO AUDIT FINDING SHEET (AFS)

N-OA
6/85

(To be used for all AFSs with added sheets as required)

Audit Finding No 862a-7 R-1 Audited Checklist Reference 862a-1 pg 10 ofAudited Organization USGSOrganization Unit Various Activity Personnel CertificationsResponse Assigned To W. W. Dudley, Jr. Reported By (Auditor) J. W. Estella

Requirement (Cite) NNWSI-SOP-02-01, Rev. 0 requires that personnel performing Quality L
I activities be certified to show competence to perform their specific duties, e.g.
design verification, document review, surveillance, etc.

Finding Contrary to the above cited requirement, there are no certifications of person
who perform reviews of technical documents. In addition, many of the USGS technical
personnel certifications do not define the area of responsibility for which these
personnel are certified. Examples are: Eduardo A. Rodriguez, David A. Ponce. (cont'd)

Approved By LA A. B. Singer 4/9/86 Response Due Date 30 days af
Receipt of

Approved By WMPOMV James Blyskal 4/10/86 Date Report

Response (To be completed by audited organization) Certification of workers is a matter
 closely affiliated with the indoctrination and training function, and full implementa-
 tion of the established certification procedure QMP-2.03. This procedure, revised
 subsequent to this finding, includes new requirements including the F&S (continued)

Implementation Date 3/31/87 Submitted By J. W. Estella Date 1/4/87

To be completed by lead auditor (LA) and reviewed by WMPOMV

Corrective Action Response

☒ Satisfactory ☐ UnsatisfactoryReviewed by LA/Date A. B. Singer 1/20/87Reviewed by WMPOMV/Date James Blyskal 1/20/87

Corrective Action Implementation

☒ Satisfactory ☐ UnsatisfactoryReviewed by LA/Date W. R. Kays 6/30/87Reviewed by WMPOMV/Date James Blyskal 6/30/87

Reaudit Date _____

Remarks Ref WmPo SR No 87-018Audit Finding Closed ☒ LA Concurrence/Date W. R. Kays 6/30/87

Reference and Number(s) for unsatisfactory reaudit _____

WMPO Audit Finding No. 862a-7 cont'd

Finding cont'd

Gary D. Hamilton, John H. Healy, Robert J. Munroe, Brennen O'Neill, William H. Prescott, Joann M. Stock, Joseph F. Svitek, Walter E. Wendt, Robert H. Colburn, Edward E. Criley, Ronald M. Kaderabek, Jeff Wilson, Dean Whitman. In some instances, the work experience included on the certifications of USGS technical personnel does not support the activities which they are certified to perform. Examples are: Susan Shipley, Paul E. Carrara, Richard Hay, Pamela Jenks, Christine Arthur, Michael Chornak, Ibrahim Palaz. Also, the certifications of Robert O. Castle and Kenneth A. Sargent were not approved by the next higher supervisory level as required by USGS procedure NNWSI-USGS-QMP-2.03, Rev. 0, paragraph 3.2; these certifications had no approvals at all. It should be noted that all the personnel certifications available for USGS technical personnel were completed within the 2 weeks prior to this audit. It should also be noted that the USGS QA program does not establish certification criteria for the USGS technical personnel. The basis for certification as described on the USGS certification form is subjective in nature. This also applies to the certification of Fenix and Scisson geologists who implement USGS activities. In addition, there are no provisions in the USGS QA program for USGS to either accept or concur with these certifications since these certifications are performed by F&S personnel.

USGS Audit Findings Response (continued)

participants who are conducting USGS directed work. Certification of all workers appropriate to the assigned work will be completed prior to achieving termination of the stop-work order.

Rev. 1 of QMP-2.03, Attachment 1 now lists on the form "Based on the above listed education, experience, and the demonstrated performance....., I certify this employee for the assigned task". This criteria shall guide the certifying chief as specified in Para. 5.4, QMP-2.03. The original of each certification on file is maintained by the QA Office where the certifications are monitored.

F&S is not a subcontractor to the USGS, but is a subcontractor to DOE/WMPD. In addition, F&S is required to have a DOE/WMPD approved QAPP that meets the requirements of NVO-196-17, which addresses the certification of workers. Consequently, the USGS does not have authority to reject an F&S personnel certification that has been properly completed and signed by the Senior Geologist. Since there is only a small number of F&S employees (6-12) involved, we believe it is more practical to maintain the certifications in the USGS QA Office in accordance with the USGS QA manual. We do not believe that it is a USGS responsibility to make revisions for F&S to acknowledge this procedure in their QAPP. If this continues to be a problem for WMPD, the USGS QA manual, QMP-2.03, R1, will be revised to delete the F&S certification form, Attachment 2. —



WMPO AUDIT FINDING SHEET (AFS)

N-OA-02
6/85

(To be used for all AFSs with added sheets as required)

862a, pg 2 of 102
Ques. 2, 3, 4a; pg.
of 102, Ques. 7, 8.

Audit Finding No. 862a-9

Audited Checklist Reference

Audited Organization USGS

Organization Unit QA

Activity Organization (I)

Response Assigned To W. W. Dudley, Jr.

Reported By (Auditor) R.F. Cote/J.W. Estella

Requirement (Cite) NNWSI-SOP-02-01-Rev. 0, Sec. 1.0, para. 1.2.4 organization states: "[f more than one organization is involved in the execution of activities affecting quality then the responsibility & authority of each organization shall be established (cont'd)

Finding Contrary to the above requirements, the USGS QAPP-Rev. 0, Sec. QMP-1.0 does not delineate in writing the responsibility & authority of each organization involved in the execution of activities affecting quality, and does not address external and internal interfaces between organizational units. In the case of internal interfaces, (cont'd)

Approved By LA A. Linger 4/8/86 Response Due Date 30 days after Receipt of Report

Approved By WMPO/NV James Blaylock 4/10/86

Date

Response (To be completed by audited organization) While this finding indicates the audit was to USGS QAPP-Rev. 0, it is believed the audit finding means the pertinent documents were USGS-QAPP, R2, QMP-1.01, R0, and the following comments are made relative to the latter. The deficiencies of this finding are largely corrected in the revision to QMP-1.01 "Organization Procedure" wherein the QA interfaces are indicated for (cont'd)

Implementation Date Approx 11/01 Submitted By W. W. Dudley Jr. Date 5/11/86

To be completed by lead auditor (LA) and reviewed by WMPO/NV

Corrective Action Response

☒ Satisfactory ☐ Unsatisfactory

Reviewed by LA/Date

A. Linger 10/30/86

Reviewed by WMPO/NV/Date

James Blaylock 10/30/86

Corrective Action Implementation

☒ Satisfactory ☐ Unsatisfactory

Reviewed by LA/Date

W. R. Kagan 6/30/87

Reviewed by WMPO/NV/Date

James Blaylock 6/30/87

Reaudit Date

Remarks REF WMPO SR No 87-018

Audit Finding Closed ☒ LA Concurrence/Date

W. R. Kagan 6/30/87

Reference and Number(s) for unsatisfactory reaudit

WMPO Audit Finding No. 862a-9 cont'd

Req. cont'd

clearly and documented. The external interfaces between organizations and the internal interfaces between organizational units and changes thereto shall be documented. Interface responsibilities shall be defined and documented."

NNWSI-SOP-02-01-Rev. 0, Par. 1.1 1; Organization, states in part . . the authority and duties of persons and organizations performing activities affecting quality shall be clearly established and delineated in writing.

Finding cont'd

the Geological Division QA Specialist Central & QA Specialist Western Division, and Nuclear Hydrology QA Specialist responsibilities and authorities are not defined and documented. The aforementioned QA personnel as depicted in the USGS Organization Chart do not appear to have access to management levels such that they have the required organizational freedom including sufficient independence from cost and schedule when opposed to safety considerations. Note: see AFS-86-2A-1. Additionally, the USGS QA organization does not clearly delineate in writing the authority and responsibility for the external interfaces between organizational units performing activities affecting quality e.g. Los Alamos National Laboratory who is performing internal and external audits for the USGS and the Bureau of Reclamation who is performing site characterization activities including, but not limited to, surface hydrology.

USGS Audit Findings Response (continued)

assigned personnel at the various locations. Responsibilities and internal interfaces for these personnel will be handled as described in the response to finding No.3, Part 3 wherein the QA Specialists will be authorized to perform specific functions, in writing, once appropriate training has been accomplished. Pursuant to the relationships of contractors, these responsibilities are as described in the pertinent contract or other instruments of agreement. New contracts will be more specific in this regard. The US Bureau of Reclamation will have their own version of the USGS QA Manual approved and signed by the USGS that will detail their related QA Program. As for LANL, any activities to continue beyond the termination of the stop-work order will be formalized in writing with details of responsibilities and interfaces.

00630



WMPO AUDIT FINDING SHEET (AFS)

N-QA-02
6/85

(To be used for all AFSs with added sheets as required)

862a-2, pg 3

Audit Finding No. 862a-14Audited Checklist Reference #3 & #6Audited Organization USGS - DenverOrganization Unit Site InvestigationActivity DocumentationResponse Assigned To W. W. Dudley, Jr.Reported By (Auditor) Forrest D. Peters

Requirement (Cite) NVO 196-17 Rev. 3 Para. 3.2.2 and 3.2.3 3.2.2 Prior to the start of a site investigation, the responsible Participating Organization shall develop a plan which will describe the tests and experiments which will be utilized to determine the (cont'd)

Finding The USGS has been and is performing numerous site investigations for the NNWSI project, as listed in The Work Breakdown Structure Dictionary, without any approved site investigation plans, and therefore, has been and is violating the requirements of the referred paragraphs. The referred paragraphs clearly prohibit any site (cont'd)

Approved By LA St. Singer 4/8/86 Response Due Date 30 days after Receipt of Report

Approved By WMPO/NV James Blaylock 4/10/86 Date _____

Response (To be completed by audited organization) The USGS is well aware of planning requirements prior to conducting an investigation and have struggled with the approach to satisfy this requirement. All Project participants seem to be struggling with selection from the plethora of required "Plans" for the preferred documentation to meet this requirement. Now that the Scientific Investigation Plan has evolved (cont'd)

Implementation Date Approx 11/1/86 Submitted By W. W. Dudley, Jr. Date 5/11/86

To be completed by lead auditor (LA) and reviewed by WMPO/NV

Corrective Action Response

☒ Satisfactory ☐ UnsatisfactoryReviewed by LA/Date St. Singer 10/30/86Reviewed by WMPO/NV/Date James Blaylock 11/1/86

Corrective Action Implementation

☒ Satisfactory ☐ UnsatisfactoryReviewed by LA/Date W. W. Kaga 6/30/87Reviewed by WMPO/NV/Date James Blaylock 6/30/87

Reaudit Date _____

Remarks Ref. WMPO SR No 87-018Audit Finding Closed ☒ LA Concurrence/Date W. W. Kaga 6/30/87

Reference and Number(s) for unsatisfactory reaudit _____

WMPO Audit Finding No. 862a-14 cont'd

Req. cont'd

geologic, hydrologic, geotechnical, or tectonic mean values and range of uncertainties of the natural host formation. The plan shall present sufficient detail to determine whether or not the activities to be conducted, the methods of analyzing the data to be gathered, and the modeling methods will ensure that the end results will provide sufficient information necessary to evaluate the characteristics of the natural barriers against the criteria specified in 10 CFR 191.

3.2.3 The responsible Participating Organization shall conduct a technical review on the plan prior to the start of any activities associated with the plan.

Finding cont'd

investigations from being performed, until and unless, a site investigation plan has been prepared, technically reviewed, and approved by WMPO.

It is true that extensive plans are in existence, or are in preparation, for the site characterization plan (SCP) and the exploratory shaft test plan (ESTP), but these plans are not in effect at this time. The USGS has generally failed to provide, or to technically review, site investigation plans for their activities within the site exploration phase of this project.

It is also true that the USGS did prepare a Work Plan for the USGS Participation in the Nevada Nuclear Waste Storage Investigation, for the fiscal year 1985 activities, but this was apparently a preliminary draft which was never completed, reviewed, or submitted to WMPO for approval. A similar document was also prepared for the fiscal year 1986, but again, this was also apparently a preliminary draft which has not yet been completed, reviewed, or submitted to WMPO for approval. These documents do not therefore, fulfill the requirements of NVO 196-17 Para 3.2.2 and 3.2.3.

(See Audit Finding 862a-15.)

USGS Audit Findings Response (continued)

within the Design Control Criteria the USGS has specified this plan is to be prepared and a procedure for it has been included in the proposed QAPP revision under QMP-3.06, R0. The appropriate plans will be prepared as a condition to terminating the Stop-Work order for each element of work being considered.



WMPO AUDIT FINDING SHEET (AFS)

N-CA-024
6/85

(To be used for all AFSs with added sheets as required)

Audit Finding No. 862a-21 Audited Checklist Reference Page 82 of 102

Audited Organization USGS - Denver

Organization Unit Records Processing Center Activity QA Records

Response Assigned To W. W. Dudley, Jr. Reported By (Auditor) Ed Oakes

Requirement (Cite) SOP-02-01, Rev. 0 (1) Para. 5.1.1 states in part: "Activities that affect quality shall be prescribed in documented instructions, procedures . . . of a type appropriate to the circumstances . . ." Para. 5.3.1 states in part: (cont'd)

Finding (1) Contrary to requirements 1 & 2 above, USGS records are being processed/reviewed using an unapproved QA procedure - "QA Records Management Guidelines" dated 1/28/86. (2) Contrary to requirement 3 above, measures have not been established to identify/document those personnel who are authorized to validate records.

Approved By LA L. Singer 4/8/86 Response Due Date 30 days after Receipt of Report
Approved By WMPO/NV James Blaylock 4/10/86 Date

Response (To be completed by audited organization) Part 1. Technically this finding is accepted as being valid; however the explanation lies in the fact the subject area should be acknowledged by all as being a Project evolving subject that requires a controlled means to handle. The referenced "QA Records Management Guidelines" are not being used as a QA Procedure, approved or not. These guidelines were prepared (cont'd)
Implementation Date Approx 9/1/86 Submitted By W. W. Dudley Date 5/1/86

To be completed by lead auditor (LA) and reviewed by WMPO/NV

Corrective Action Response

☒ Satisfactory ☐ Unsatisfactory

Reviewed by LA/Date L. Singer 10/30/86

Reviewed by WMPO/NV/Date James Blaylock 6/1/87

Corrective Action Implementation

☒ Satisfactory ☐ Unsatisfactory

Reviewed by LA/Date L. R. Meyer 6/30/87

Reviewed by WMPO/NV/Date James Blaylock 6/30/87

Reaudit Date

Remarks Ref WMPO SR No 87-018

Audit Finding Closed ☒ LA Concurrence/Date W. W. Dudley 10/30/87

Reference and Number(s) for unsatisfactory reaudit

WMPO Audit Finding No. 862a-21 cont'd

Req. cont'd

". . . QA administrative documents for Level I shall be approved by WMPO before they can be used." (2) USGS-QMP-17.01, Para. 4.3 states in part: "The Records Administrator is responsible for management and implementation of the USGS records management system. This includes instituting a program to review potential QA records to ensure their completeness, suitability and legibility, and for retention processing. The Administrator will also be responsible for receipt control, indexing and submittal to the PRC." (3) USGS-QMP-17.01, Para. 5.5 states in part: "All documents, including controlled documents, are to be stamped, initialed, or signed and dated by authorized personnel, or otherwise authenticated, appropriate to the class of the documents . . ."

USGS Audit Findings Response (continued)

by the USGS records processing center as a means to train the various records participants and as a means to checklist all requirements of the approved QA management procedure, QMP-17.01. In this case it was true that the guidelines contained information more current than QMP-17.01, which resulted from Project issued changes and updates for the emerging program of which the USGS was the pilot program. The fact that the QMP-17.01 approval date precedes the approval of the SOP should be evidence to the auditor that some changes might be necessary and that some means would have to be available internally to provide for this interim situation. This deficiency has been corrected through full incorporation of the Project directed requirements in the subsequent Rev 1 to QMP-17.01 currently under review by WMPO. It remains our intention to continue using the guidelines as a training vehicle to ensure full compliance with the approved QMP.

Part 2. This deficiency will be corrected by the issuance of a letter to all appropriate personnel in the USGS and WMPO stating the list of authorized personnel to validate the records. This has not been done to date awaiting approval of the USGS QA Manual so that ~~the~~ it can be done to the latest approved procedures. The letter will be issued as a high priority upon achieving WMPO's approval of the manual.

STOP WORK ORDER STATUS

QACG 7/87

STATUS OF NNWSI STOP WORK ORDERS

RESCINDED STOP WORK ORDERS

- o LANL STOP WORK ORDER RESCINDED NOVEMBER 1986
- o SAIC STOP WORK ORDER RESCINDED MARCH 1987
- o SNL STOP WORK ORDER RESCINDED DECEMBER 1986
- o REECO STOP WORK ORDER RESCINDED JANUARY 1987

USGS STOP WORK ORDER STATUS

- o GENERIC CONDITIONS COMPLETED
 - 1. CORRECTIVE ACTIONS TO AUDIT FINDINGS APPROVED BY WMPO
 - 2. USGS QAPP REVISED AND APPROVED BY WMPO
 - 3. INDOCTRINATION AND TRAINING WAS COMPLETED BY USGS
 - 4. ADEQUATE QA RESOURCES IDENTIFIED
- o REVIEW AND APPROVAL OF QUALITY ASSURANCE LEVEL ASSIGNMENTS (QALA) TO WORK EFFORT CONTINUES
 - SCIENTIFIC INVESTIGATION PLANS AND QALAS APPROVED - 3
 - SCIENTIFIC INVESTIGATION PLANS AND QALAS FOR APPROVAL - 15
 - SCIENTIFIC INVESTIGATION PLANS AND QALAS UNDER REVIEW - 16
 - SCIENTIFIC INVESTIGATION PLANS AND QALAS REMAINING - 22
(4 CURRENT WORK - 18 FUTURE WORK)

LLNL STOP WORK ORDER STATUS


- o REVIEW AND APPROVAL OF QUALITY ASSURANCE LEVEL ASSIGNMENTS (QALA) TO WORK EFFORT CONTINUES

SCIENTIFIC INVESTIGATION PLANS AND QALAS APPROVED - 5

SCIENTIFIC INVESTIGATION PLANS AND QALAS UNDER REVIEW - 4

SCIENTIFIC INVESTIGATION PLANS AND QALAS REMAINING - 1

TRIP REPORT

TO: King Stablein	TRAVELER F R O M Thomas Jungling BRANCH Technical Review Branch
PLACES VISITED Lawrence Livermore National Laboratory	DATES OF TRIP August 19-20, 1987
PERSONS CONTACTED Attendance List Attached	
PURPOSE OF TRIP Update of Topics in the NNWSI Waste Package Metals Barrier Area - Topics List Attached	
ACCOMPLISHMENTS After reviewing the expected environment the alloy selection process was described in detail including the documentation discussing each failure mode, i.e., degradation mode surveys. Additional discussion concentrated on Microstructural concerns for both the copper and austenitic steel families. (See attached summary report)	
PROBLEMS ENCOUNTERED The meeting was unlike a typical appendix 7 visit for several reasons namely; 1) Meeting content-the large time interval between interactions necessitated the somewhat formalized presentations to simply bring staff up to the current status. Additionally the lack of ongoing experimental work precluded the collection of useful information through a laboratory visit. 2) Meeting size- 30 participants inhibited the informal discussions intended in an appendix 7 interaction. The items were more necessary evils than problems which should be avoided with more Frequent exchanges. None	
RECOMMENDATIONS While information in the Metals Barrier area is current, it is recommended that additional interactions of a more limited scope be arranged. Potentially appropriate subjects include; status of concerns regarding austenitic phase transformations, review of degradation mode surveys, or discussion of the microstructural issues regarding the performance of copper. A similar meeting of this should be considered in the Waste form area.	
SIGNATURE - TRAVELER 	DATE 8/27/87

SUMMARY OF NNWSI WASTE PACKAGE
APPENDIX 7 VISIT TO LAWRENCE LIVERMORE NATIONAL LAB

The intent of this summary is to briefly and simply describe the topic areas discussed during the August 19 and 20, 1987 Appendix 7 visit to LLNL regarding the NNWSI Waste Package Program. As a result of the two year interval which elapsed since the last NRC/NNWSI interaction (July 1985 Waste Package Workshop) the visit was more formal than a typical Appendix 7 interaction. Presentations by LLNL staff and contractors were utilized to update NRC participants on unpublished recent activities and future plans. The attached list of topics was prepared by Livermore staff based on a list of subjects proposed by the NRC staff.

The meeting was coordinated by Dr. Virginia Oversby who presented the introductory remarks. One point, in particular, mentioned concerned guidance received from DOE Headquarters regarding design goals for the waste package. The guidance directed the projects that the goal for substantially complete containment was that 80 percent of the waste packages remain intact at 1000 years. The NRC staff were not aware of this guidance prior to the visit.

Waste Package Environment - Bill Glassley

The basis position regarding waste package environment has not changed significantly in the past two years, i.e., little new site data has been collected. A discussion did occur regarding USGS data on pore water composition, indicating higher levels of chloride and sulfate ions by approximately an order of magnitude more than the reference J-13 composition. LLNL pointed out that the samples were taken from a zeolite layer at a depth of 90 meters (repository is to be at 300 meters) therefore they indicated that the data is not directly comparable. However, LLNL indicated that the composition of pore water is still unknown at the repository horizon and could potentially be somewhat higher in ionic strength than a J-13 composition.

Gamma Radiation Studies - Rick Van Konynenburg

Based on the anticipated conditions, i.e., container temperatures above the boiling point of water coinciding with the initially high radiation fields, the effects of radiation will be negligible during the first several hundred years. With the return of cooler temperatures and liquid water a relatively small quantity of nitric acid could be produced from radiolysis. Future studies will analyze the possible consequences of nitric acid on localized corrosion processes.

Alloy Selection Process - Bill Hasley

There are current six alloys being evaluated: three copper alloys, CDA 102 (OFHC), CDA 613 (Al-Bronze), CDA 715 (Cu-Ni); two austenitic stainless steels, 304L and 316L; and the austenitic, nickel alloy, Incoloy 825. During FY88 this list will be narrowed to one alloy or perhaps one alloy and one backup alloy. The selection process was described as a three step process.

Step one consists of documenting all relevant information and data on each candidate alloy for each potential degradation mode. The product will be a Degradation Mode Survey report for each potential degradation mode. Step two is the development of selection criteria, including weighting factors and pass/fail conditions. The final step is the application of the criteria of step two to the data of step one. Both the second and third steps will be subjected to a peer review in accordance with the NRC GTP on Peer Review.

Following the selection of the container alloy an experimental test plan will be developed to obtain license applicable data. Data is expected to be collected for three years before the Licensing Application is to be submitted. The data is intended to be used to validate models rather than provide complete justification on its own.

Models to Predict Metal Performance - Dan McCright

Model development is still in the early stages. The approach that is planned will model the rate and extent of attack for each mode of degradation. A statistical analysis will also be performed on the models. A set of experiments will be designed to subject the material to a range of decreasingly aggressive environments for increasing time intervals, so that the final experiments attempt to simulate the anticipated conditions for a period of tens of years. The data will provide model validation and hopefully identify threshold levels, e.g., chloride levels below which no degradation occurs.

Metal Microstructures - Mary Juhas (Stainless Steels)

Consideration of phase transformations and sensitization constitute a major activity in assessing the performance of the austenitic stainless steels. Phase transformations can produce brittle phases which reduce mechanical properties and resistance to some cracking mechanisms, while sensitization leads to intergranular attack. Both issues are of greatest concern in the welded regions. Low temperature sensitization is not expected to be a problem for alloy 316, although the efforts of welding induced strains have not been completely analyzed. Incoloy 825 has an advantage in this area since it is fully austenitic and will not be susceptible to transformations.

Dan Bullen (Copper and Copper Alloys)

Concerns regarding the copper alloys include: "Hydrogen Sickness" and other hydrogen effects, and microprecipitation or phase separation for the copper alloys. Hydrogen sickness is the loss of mechanical strength along grain boundaries resulting from copper oxide precipitates, which form during welding, reacting with diffusing hydrogen to form water bubbles at the grain boundaries. This problem can be avoided by changing from pure copper to a deoxidized copper.

Electrochemically-Based Models - Dan McCright/Joe Farmer

Electrochemical tests for both the copper and ferritic based materials were described. Much of the work is contained in perviously published reports. However, a new approach to model pitting in the austenitic materials was presented by Dr. Farmer. The model differs from other models mainly in the film breakdown step, which for this model relates the growth of oxide inclusions in the film to its eventual breakdown.

Container Fabrication and Closure - Bill Halsey

Evaluations of potentially acceptable fabrication and closure methods being performance by LLNL contractor, Babcock and Wilcox, were presented. The evaluation is intended to recommend one or possibly two fabrication and closure methods for the containers considng many of the same factors as in the material selection process.

Tom Jungling of the NRC staff discussed some of the differences in the requirements of high-level and low-level waste containers. An analogy was presented of an approved metallic LLW container which was designed to an ASME Boiler and Pressure Vessel code. Although the LLW container was designed to less stringent requirements (10 CFR Part 61) its wall thickness and corrosion resistance appears to exceed LLNL's reference HLW container. It was suggested that LLNL consider utilizing the ASME Code in the design of the HLW container.

Summary

Although the visit was formal in appearance it was agreed that the discussions were very candid and relaxed. It was expressed by many that such visits should occur on a more frequent basis to facilitate more detailed discussions of more specific topics.

TOPICS FOR DISCUSSION

8/19 Wednesday morning

Introductory remarks NNWSI
NRC

Waste Package Environment

Gamma Radiation Studies

Wednesday afternoon

Introduction to metals area

Alloy selection process

Models to predict metal
performance

Data to be used in selection
process

8/20 Thursday morning

Metal microstructures

Intergranular SCC model

Thursday afternoon

Electrochemically-based models

Container fabrication and closure

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APPLICATION OF EQ3/6 TO THE FORMULATION
OF A RELEASE MODEL FOR GLASS WASTE FORMS

ROGER D. AINES

CAROL J. BRUTON

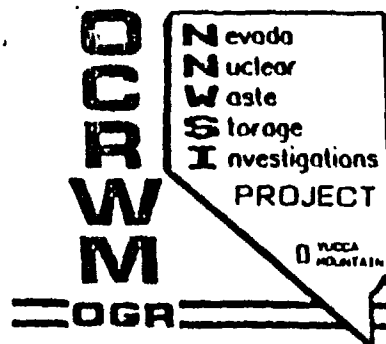
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OUTLINE OF PRESENTATION

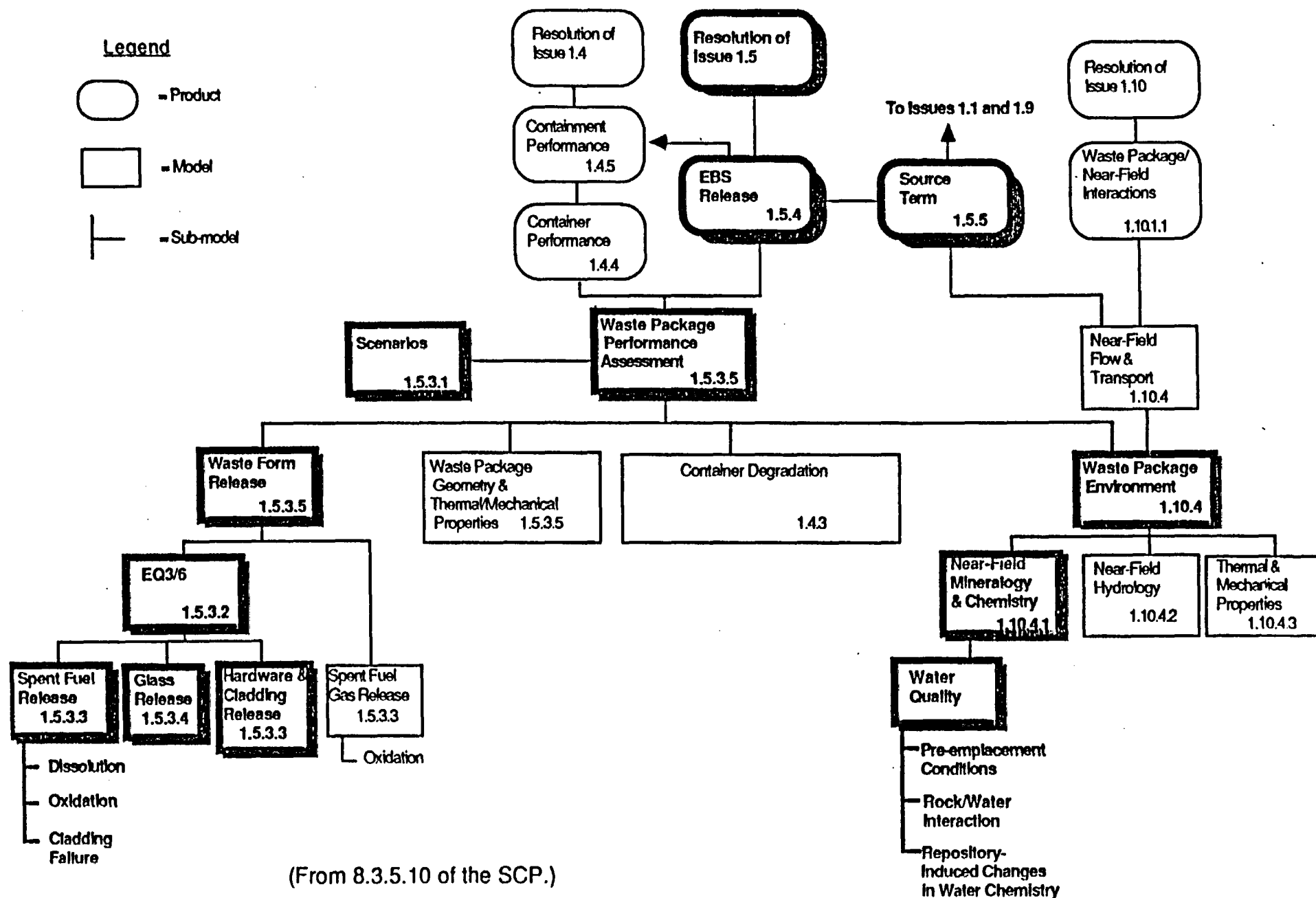
- BACKGROUND AND PLANS FOR THE USE OF EQ3/6 IN WASTE RELEASE AND PACKAGE ENVIRONMENT MODELING (AINES)
- EXAMPLE OF THE USE OF EQ3/6 IN MODELING SOLUTION COMPOSITIONS IN CONTACT WITH DEGRADING WASTE GLASS (BRUTON)
- VALIDATION OF RELEASE MODELS WHICH UTILIZE EQ3/6 CALCULATIONS (AINES)

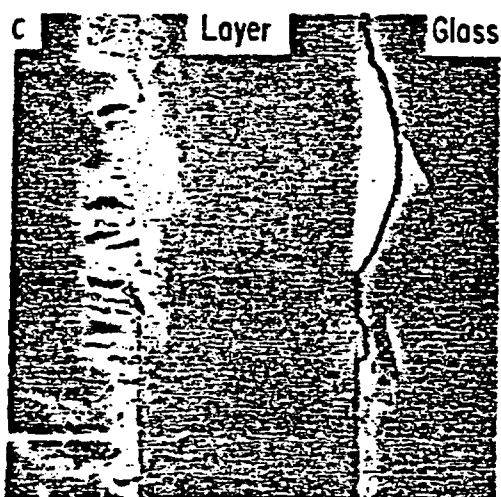
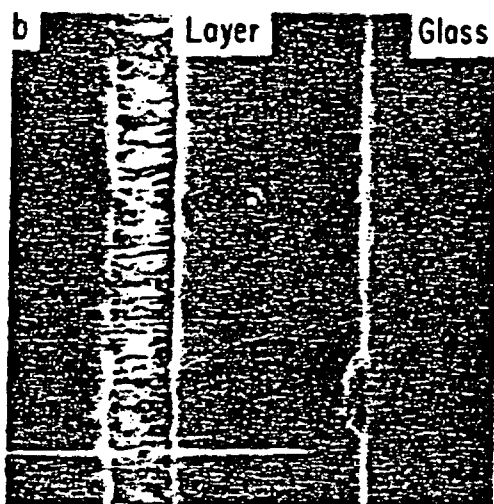
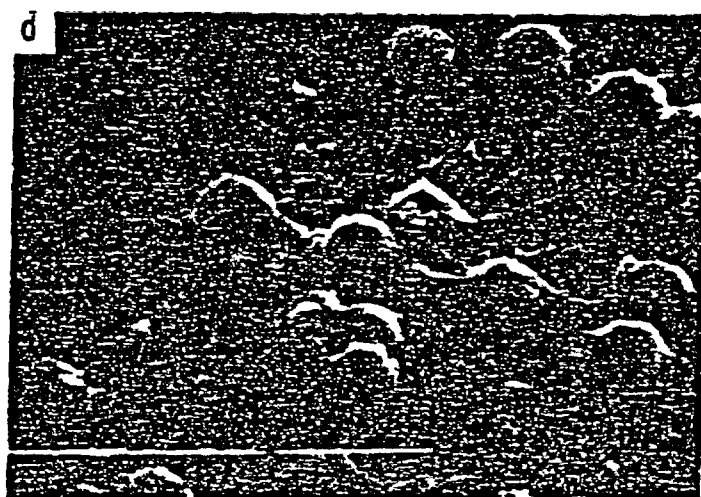
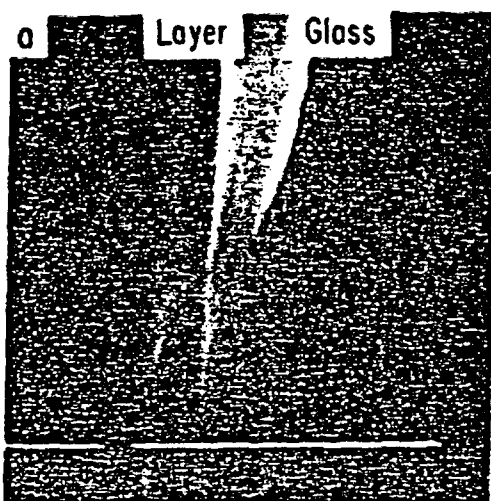


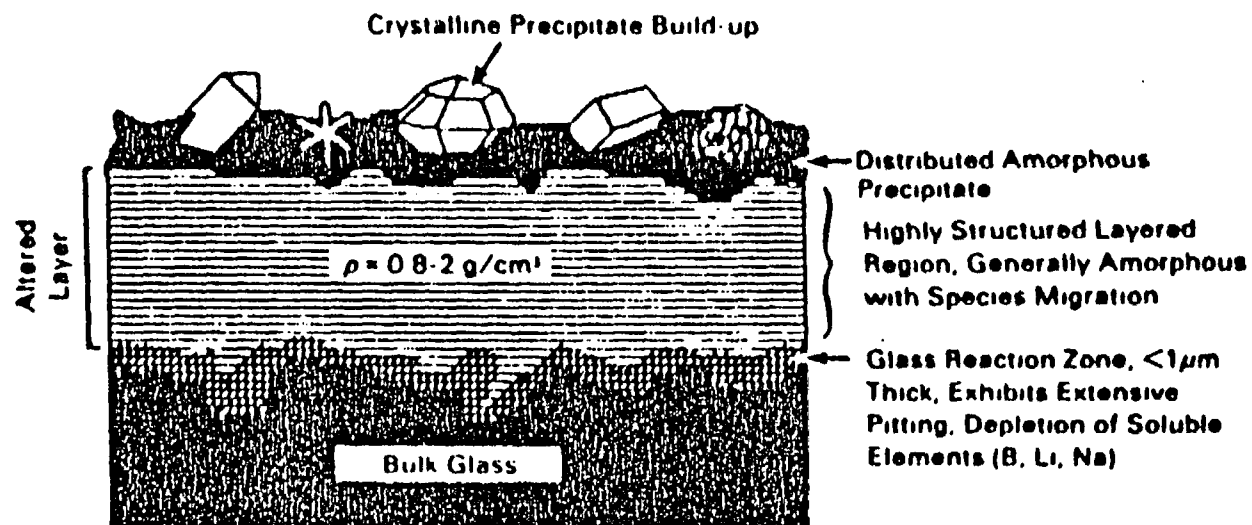
EQUILIBRIUM GEOCHEMICAL MODELING

- THE FUNDAMENTAL APPROACH OF EQ3/6 IS TO MODEL EQUILIBRIUM PHASE RELATIONS AMONG AQUEOUS SOLUTIONS AND SOLIDS
- EQ3/6 PROVIDES A CHEMICAL "CALCULATOR" FOR A WIDE VARIETY OF CHEMICAL SPECIES, SOLIDS, AND PHYSICAL CONDITIONS
- KINETICS MAY BE ADDED TO THE CALCULATIONS WHEN THEY ARE KNOWN

Use of EQ3/6 in Waste Package work.





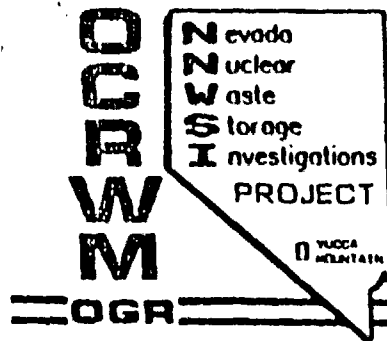


Final Report of the Defense High-Level Waste Leaching Mechanisms Program

PNL-3157

Compiler

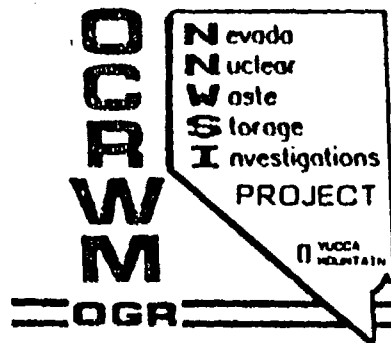
J. E. Mondel, Pacific Northwest Laboratory



GLASS DISSOLUTION STEPS

1. SELECTIVE LEACHING OF Na^+ , Li^+ FROM THE NEAR-SURFACE BY
DIFFUSION-CONTROLLED MECHANISM
2. THE RESULTING SILICA-RICH OUTER SURFACE SLOWLY DISSOLVES, ULTIMATELY
CONTROLLING GLASS DISSOLUTION RATES
3. CRYSTALLINE PRECIPITATES EVENTUALLY FORM ON THE GLASS SURFACE, AND
WITHIN THE "LEACHED LAYER"

STEPS 2 AND 3 CONTROL LONG-TERM BEHAVIOR, AND CAN BE MODELED USING EQ3/6

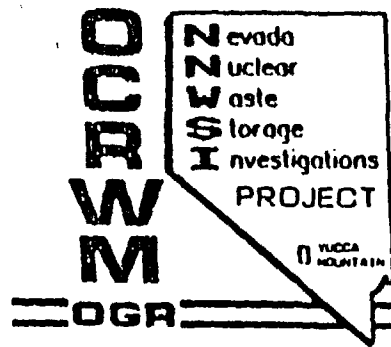


SOURCES OF INPUT TO GLASS MODEL

1. FUNDAMENTAL GEOCHEMICAL PRINCIPLES AND DATA
2. LABORATORY EXPERIMENTS
3. NATURAL SYSTEM'S BEHAVIOR

CRITICAL THAT MODEL SHOULD NOT BE A CURVE-FIT TO LABORATORY DATA, BUT RATHER SHOULD ACCURATELY REPRODUCE LABORATORY DATA BEGINNING WITH GEOCHEMICAL PRINCIPLES AND DATA

LABORATORY EXPERIMENTS AND NATURAL SYSTEMS PROVIDE CONSTRAINTS AND DETAIL THE INTERACTIONS TO BE MODELED



GLASS RELEASE MODELING GOALS

1. TO DEVELOP A MODEL FOR SOLUTION COMPOSITIONS EXITING A WASTE PACKAGE THAT INCLUDES THE EFFECTS OF GLASS BREAKDOWN, PRECIPITATION OF SOLIDS AND INTERACTIONS WITH THE CONTAINER/POUR CANISTER
2. TO ASCERTAIN THAT THE REQUIRED DATA TO RUN THE MODEL IS AVAILABLE AND APPROPRIATE
3. TO VALIDATE THE MODEL AND DATA USING NATURAL ANALOGUES, LABORATORY EXPERIMENTS, AND PEER REVIEW

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RELEASE MODEL STRUCTURE

- EQ3/6 IS THE FRAMEWORK UPON WHICH THE RELEASE MODEL IS BEING CONSTRUCTED.
- IT IS CURRENTLY ANTICIPATED THAT MOST RELEASE MODELING GOALS WILL BE ATTAINED USING THE EXISTING AND PLANNED EQ3/6 CAPABILITIES.
- DETAILS OF THE RELEASE MODEL INVOLVE CHOOSING REACTION MECHANISMS (CHEMICAL INTERACTIONS AND RELATIONSHIPS) FOR THE CODE TO MODEL.
- BASES FOR CONSTRUCTION OF THE DETAILED MODEL ARE LABORATORY AND NATURAL ANALOGUE RESULTS.

GLASS-SPECIFIC DATA



- NEW DATA REQUIRED FOR GLASS MODELING IS IDENTIFIED THROUGH LABORATORY EXPERIMENTS AND LITERATURE SURVEYS.
- DATA IS COLLECTED OR REVIEWED BY THE GLASS WASTE FORM ACTIVITY.
- DATA IS THEN ADDED TO EQ3/6 DATABASE FOR USE IN MODELING.

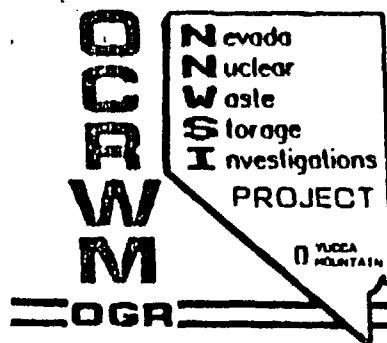
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WHY USE A GEOCHEMICAL CODE?

- EXTRAPOLATIONS OF LABORATORY DATA ARE HARD TO MAKE ACCURATE BEYOND THE TIMESCALE OF THE EXPERIMENT
- LONG TERM MODELS REQUIRE USE OF RELIABLE, WIDELY ACCEPTED INPUT (I.E., THERMODYNAMIC DATA)
- WASTE SYSTEMS ARE EXTRAORDINARILY COMPLICATED; GEOCHEMICAL MODELING ALLOWS US TO ADDRESS THAT COMPLEXITY, INCLUDING VARIATIONS OF CHEMISTRY, TIME, AND TEMPERATURE
- GEOCHEMICAL CODE USE ALLOWS YOU TO EASILY EXAMINE A WIDE RANGE OF CONDITIONS, EVEN THOSE THAT AREN'T EXPERIMENTALLY ACCESSIBLE.



STAGES OF MODEL DEVELOPMENT USING EQ3/6 CODE

COMPLETE

1. CALCULATE SOLUTION COMPOSITIONS FOR FIXED, CONSTANT-RATE BREAKDOWN OF GLASS IN EQUILIBRIUM WITH STABLE SOLID PRECIPITATES, AND STAGNANT WATER

IN PROGRESS
(30% COMPLETE)

2. INCLUDE A GLASS SOURCE-TERM BASED ON HYDRATION THEORY AND KINETICS UTILIZING TRANSITION-STATE THEORY FOR SILICA DISSOLUTION

IN PROGRESS
(10% COMPLETE)

3. INCLUDE PRECIPITATION KINETICS FOR SOLID PHASES, RESULTING IN REALISTIC SOLID PRECIPITATES

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STAGES OF MODEL DEVELOPMENT USING EQ3/6 CODE (CONTINUED)

IN PROGRESS
(10% COMPLETE)

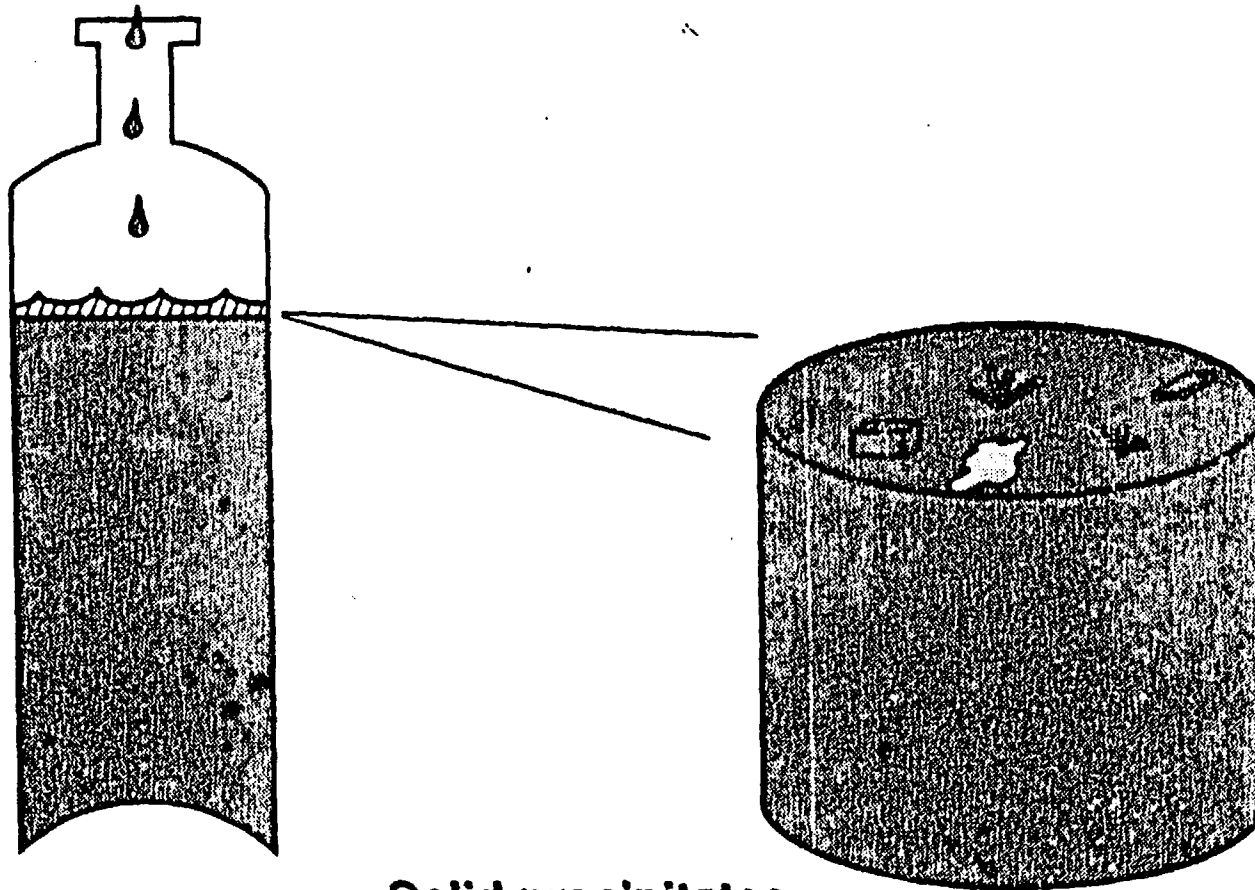
4. ADD INTERACTIONS WITH POUR CANISTER AND CONTAINER
MATERIAL (SOME NEW EQ3/6 CODE NEEDED)

BEGIN FY 89

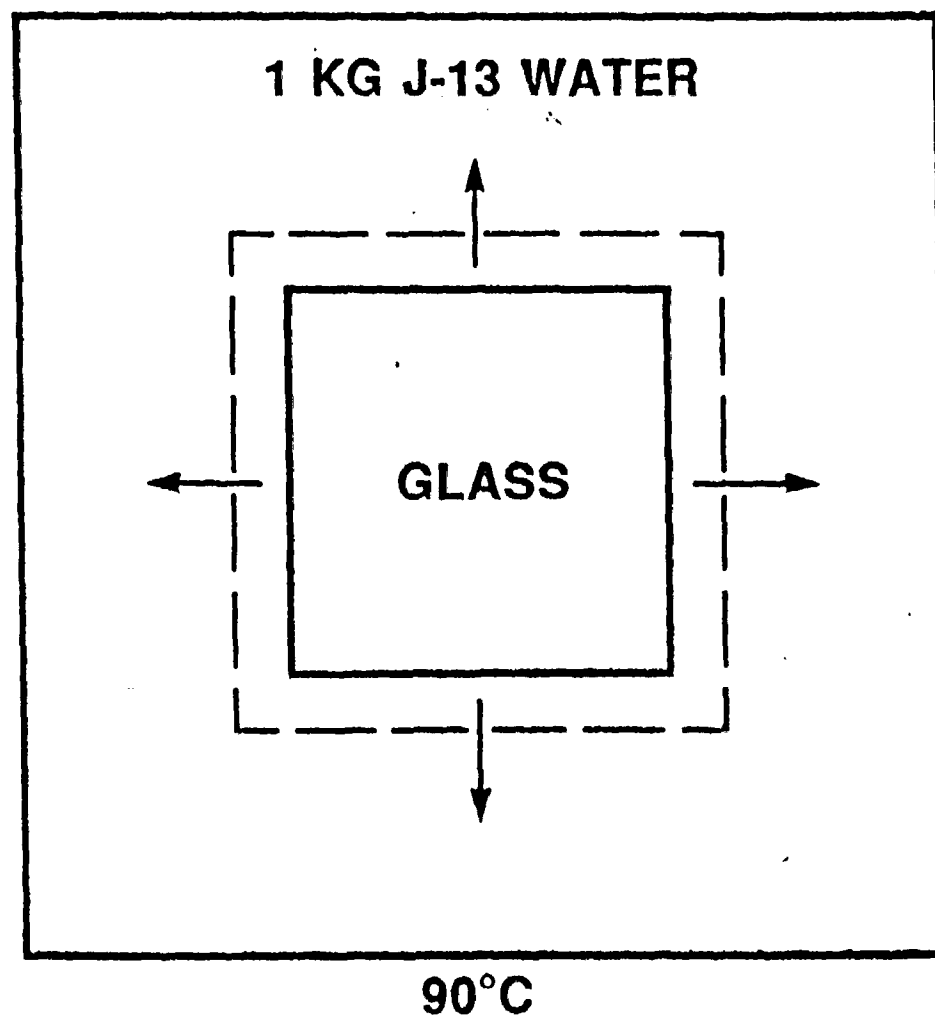
5. ADD ABILITY TO MODEL EVOLUTION OF WASTE FORM AND
WATER AS WATER FLOWS THROUGH THE WASTE PACKAGE
SYSTEM (CONSIDERABLE NEW EQ3/6 CODE NEEDED).



Predict effects of continuous waste-fluid interaction on



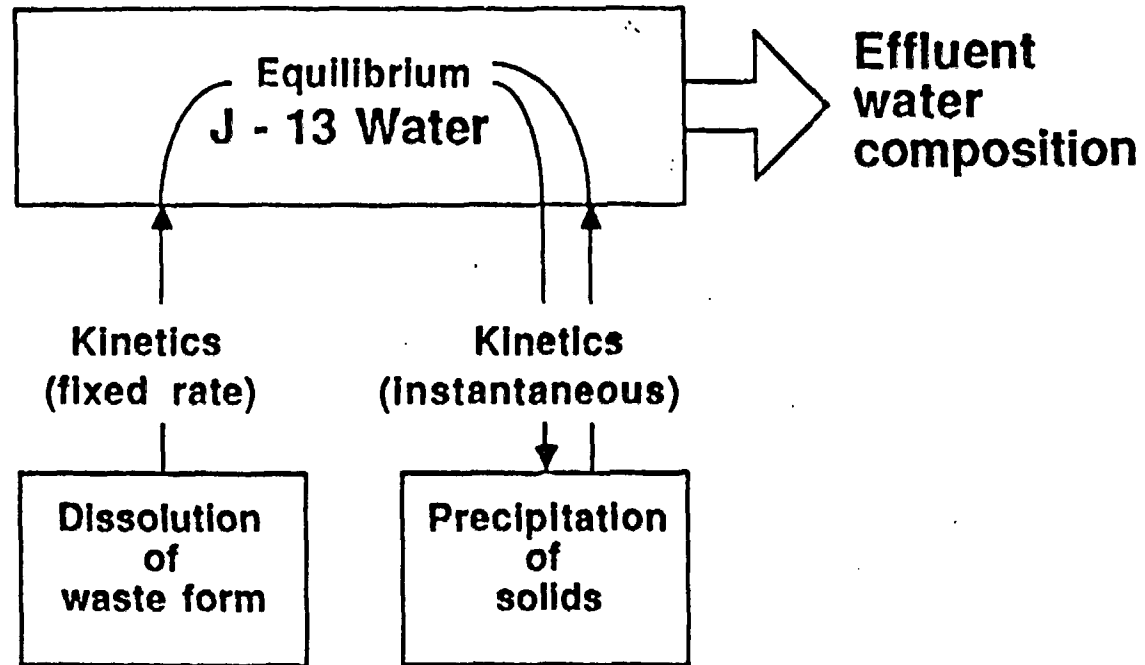
- Solid precipitates
- Fluid chemistry

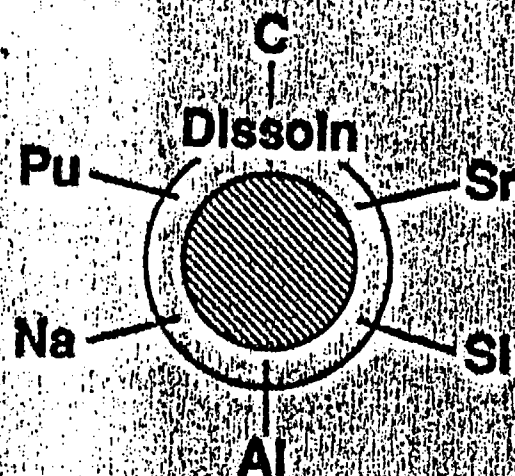


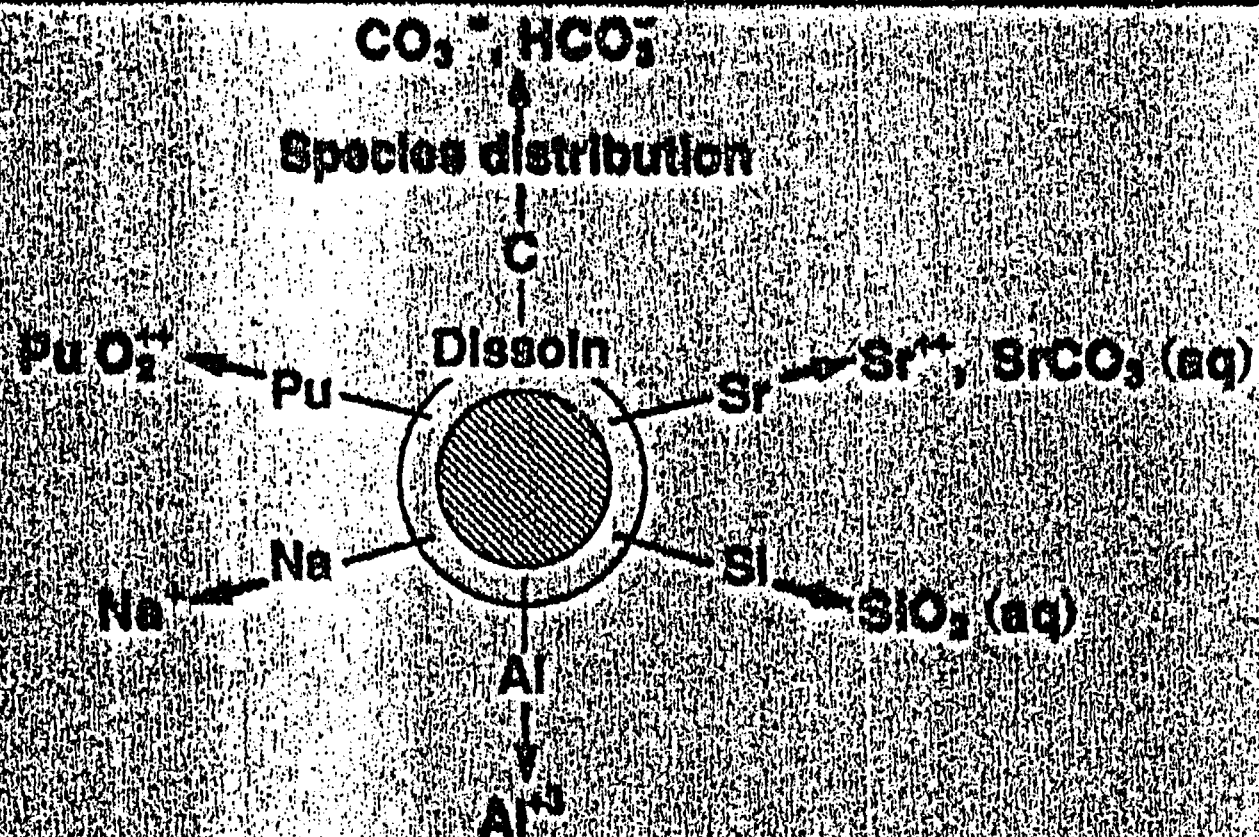
Assumptions



- **Congruent dissolution of glass**
- **Glass dissolves into fixed mass of J-13 water at 90° C**
- **No inhibitions to precipitation**
- **All solid phases are considered to be potential precipitates**









Species distribution

C

Dissolve



Pu

Sr



Na

Na

Si



Al



Solid saturation



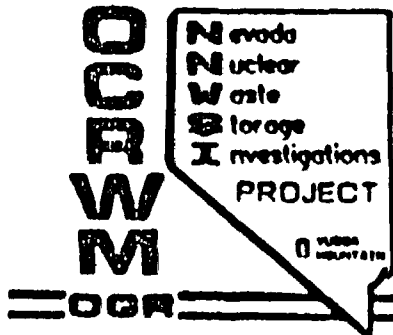
No

Yes

Precipitation

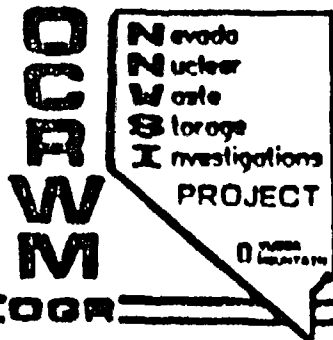
Revised fluid chemistry





ANTICIPATED RESULTS

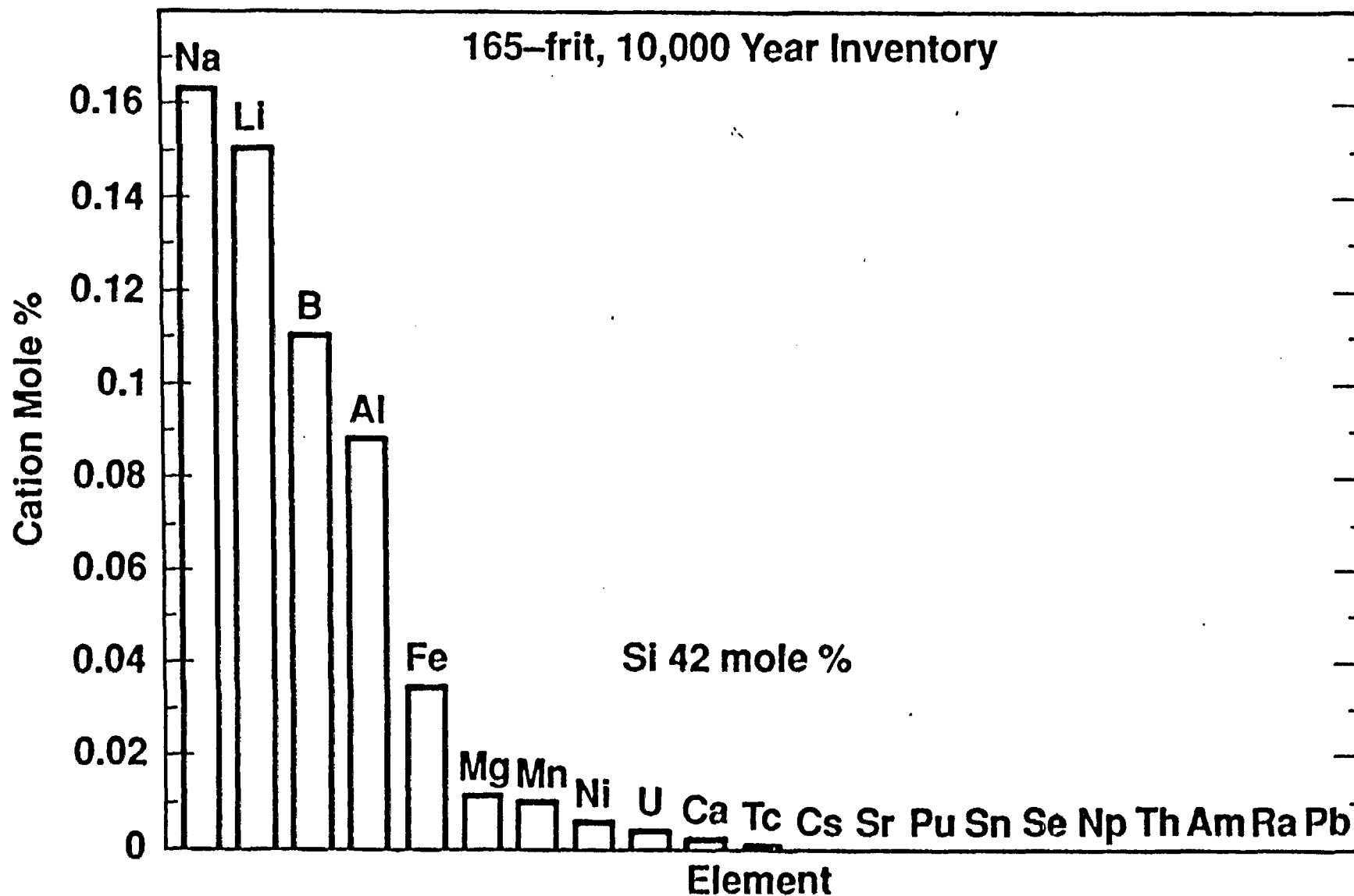
- WATER CHEMISTRY IN CONTACT WITH THE GLASS WASTE FORM AS A FUNCTION OF THE AMOUNT OF DISSOLVED GLASS
- CONCENTRATION AND SPECIATION OF RADIONUCLIDES IN THE EFFLUENT WATER AS A FUNCTION OF AMOUNT OF DISSOLVED GLASS
- IDENTITY OF SOLIDS CONTROLLING WATER CHEMISTRY, AND THE ABILITY OF SOLIDS TO SEQUESTER RADIONUCLIDES



CONSIDER EQ6 RESULTS AS:

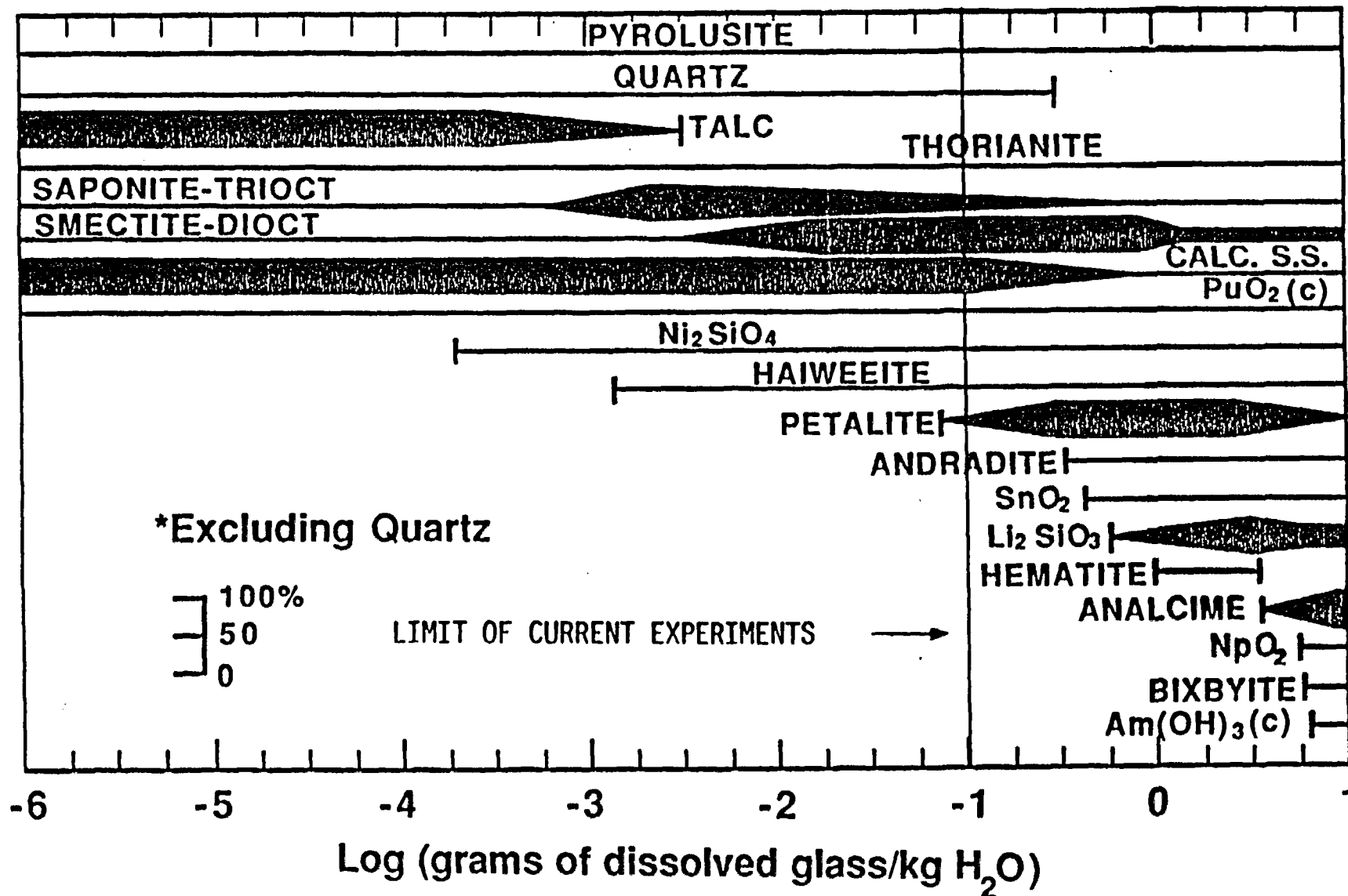
- MEANS OF UNDERSTANDING AND INTERPRETING THE COMPLEX INTERPLAY OF PROCESSES ACCOMPANYING WASTE FORM DISSOLUTION
- INITIAL STEP IN MODELING THE GEOCHEMICAL EVOLUTION OF THE WASTE PACKAGE SYSTEM
- OPPORTUNITY TO EVALUATE THE IMPACT OF VARIOUS SCENARIOS AND EXPERIMENTALLY INACCESSIBLE CONDITIONS ON THE WASTE PACKAGE SYSTEM

Savannah River Glass Bibler Slurry-Fed Melter



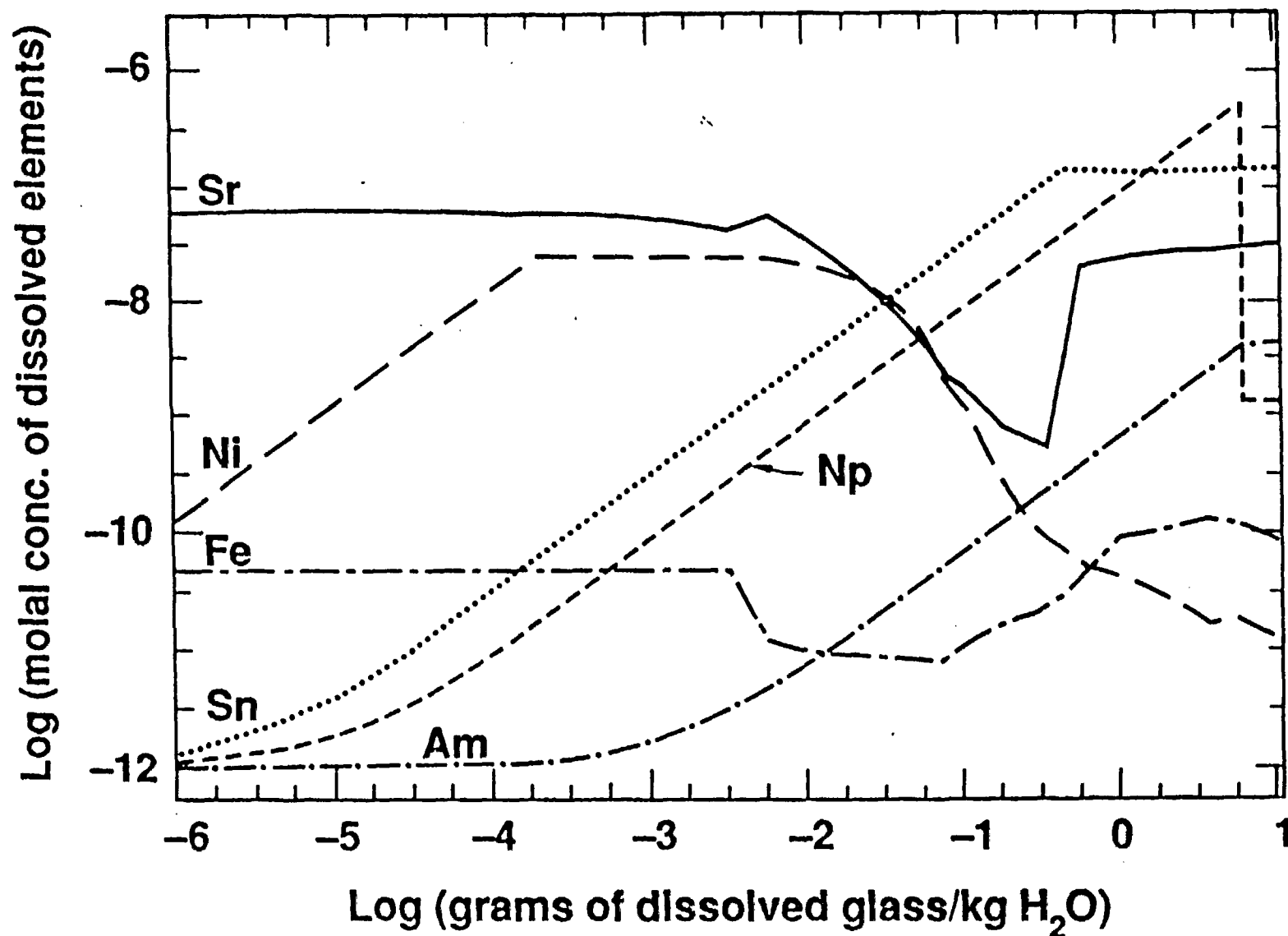
SRL 165 FRIT

Mole percent solid precipitates* 90°C



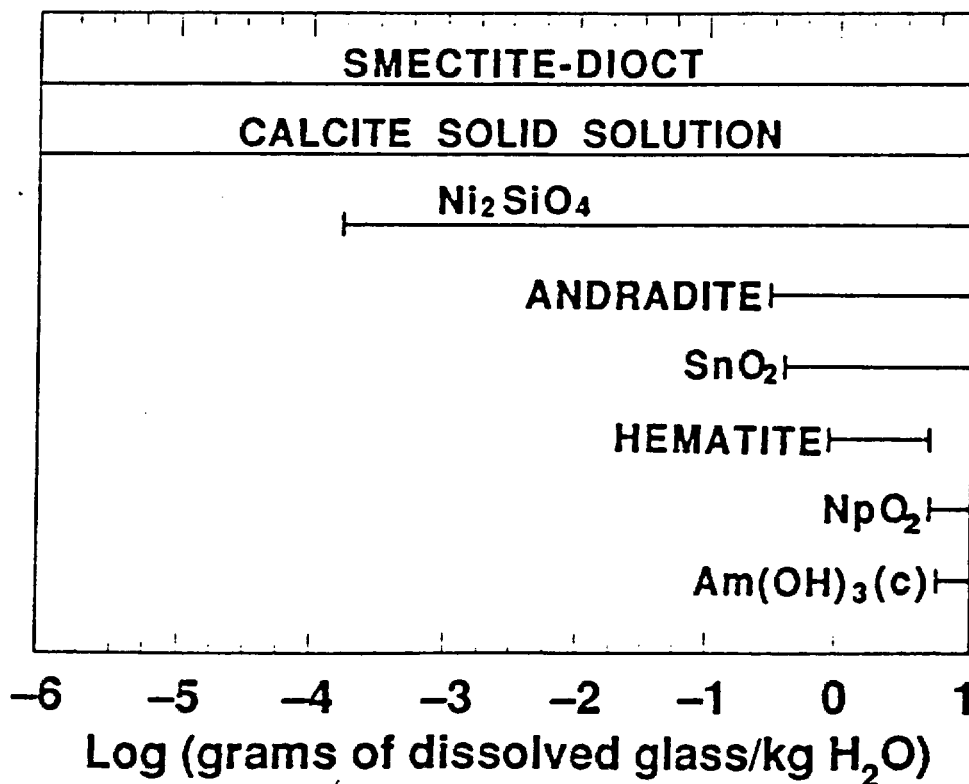
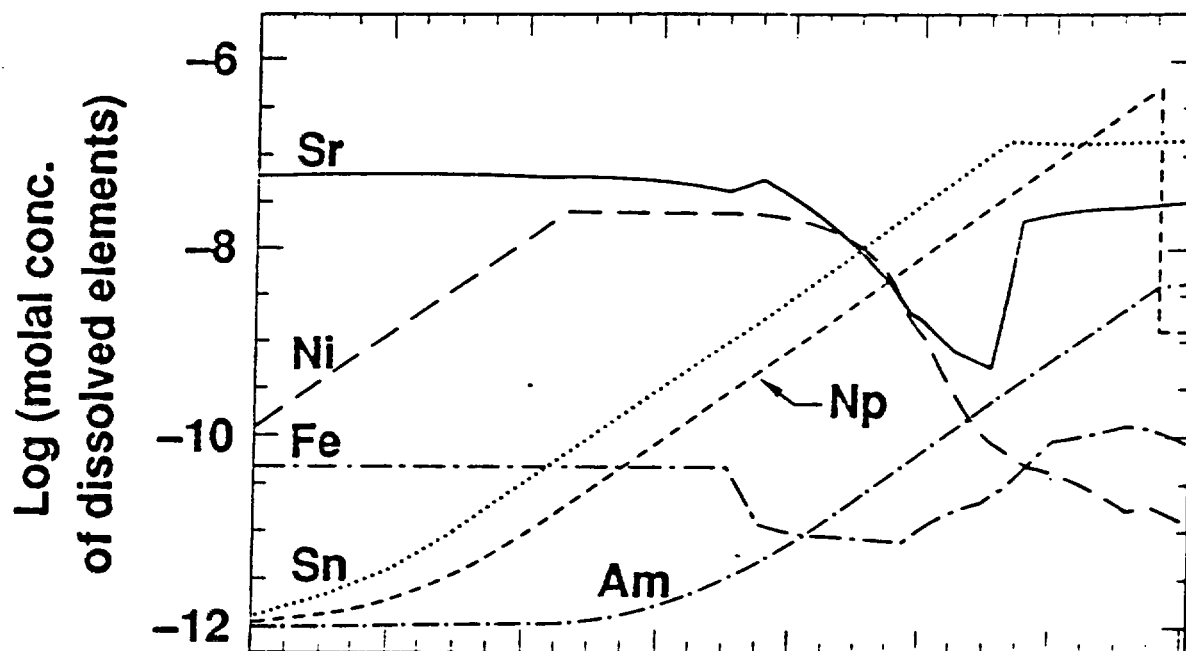
SRL 165 FRIT

Solution composition 90°C

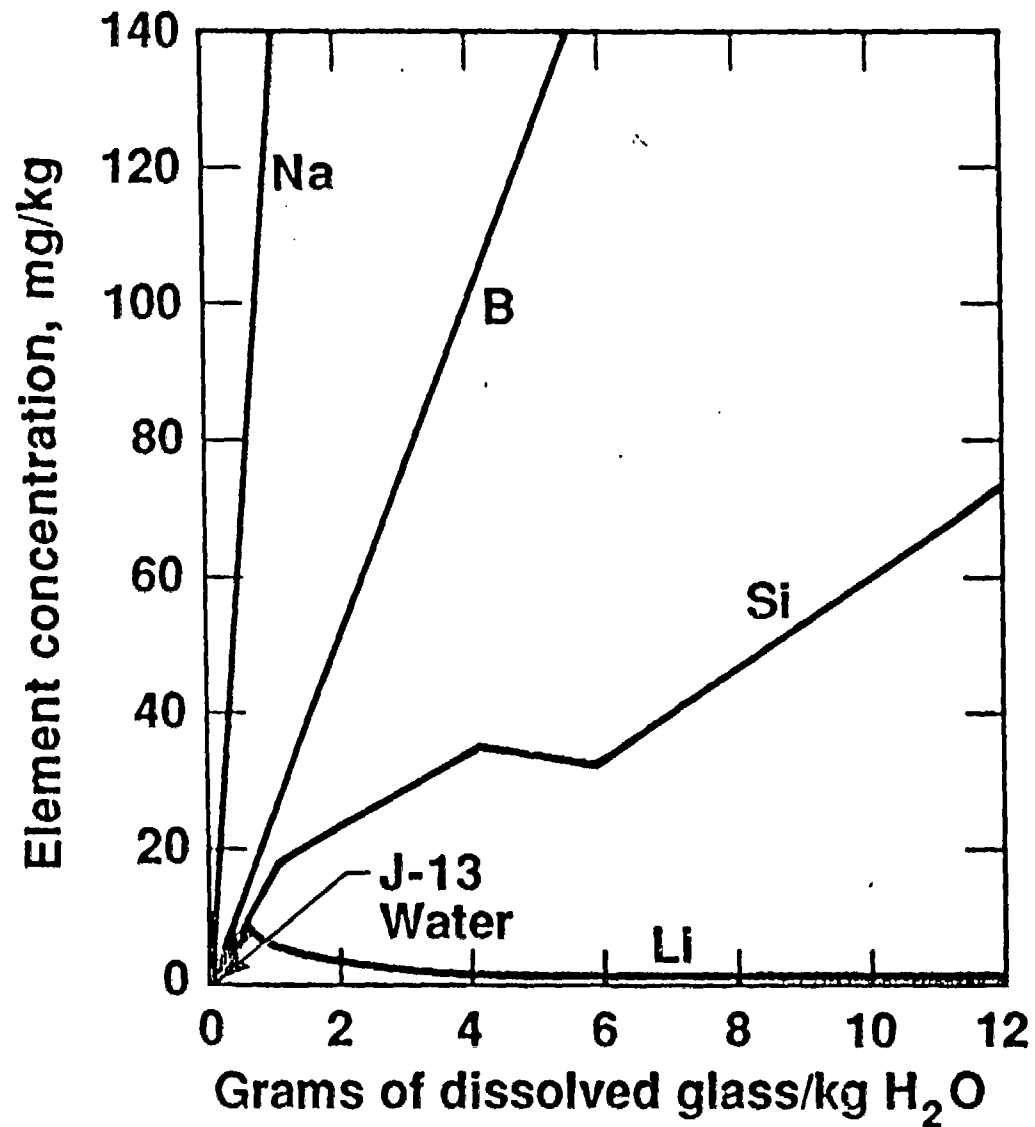


SRL 165 FRIT

Solution composition 90°C



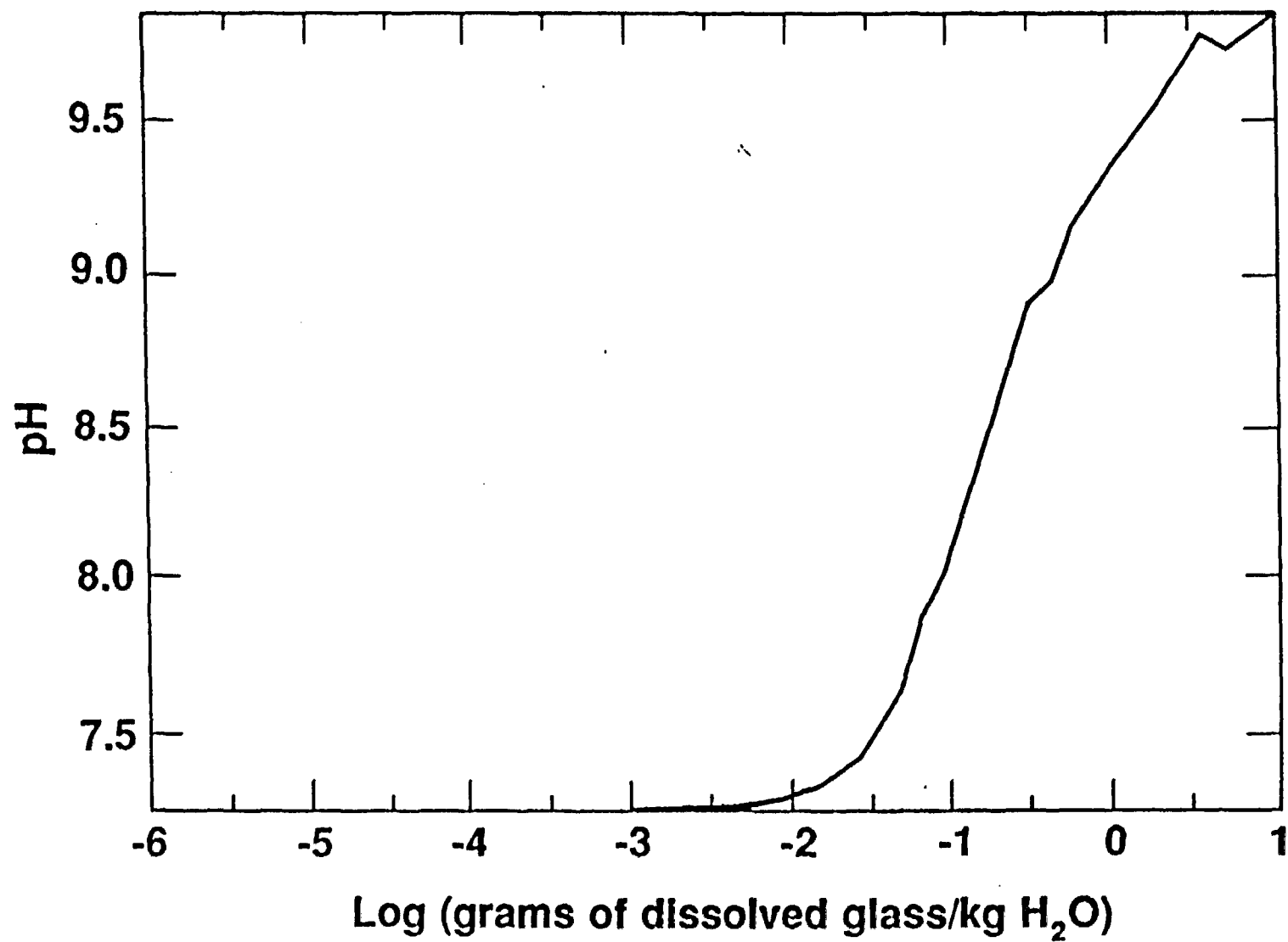
Major element fluid chemistry



MAJOR ELEMENT CHEMISTRY
SRL 165 FRIT/J-13 WATER 90°C

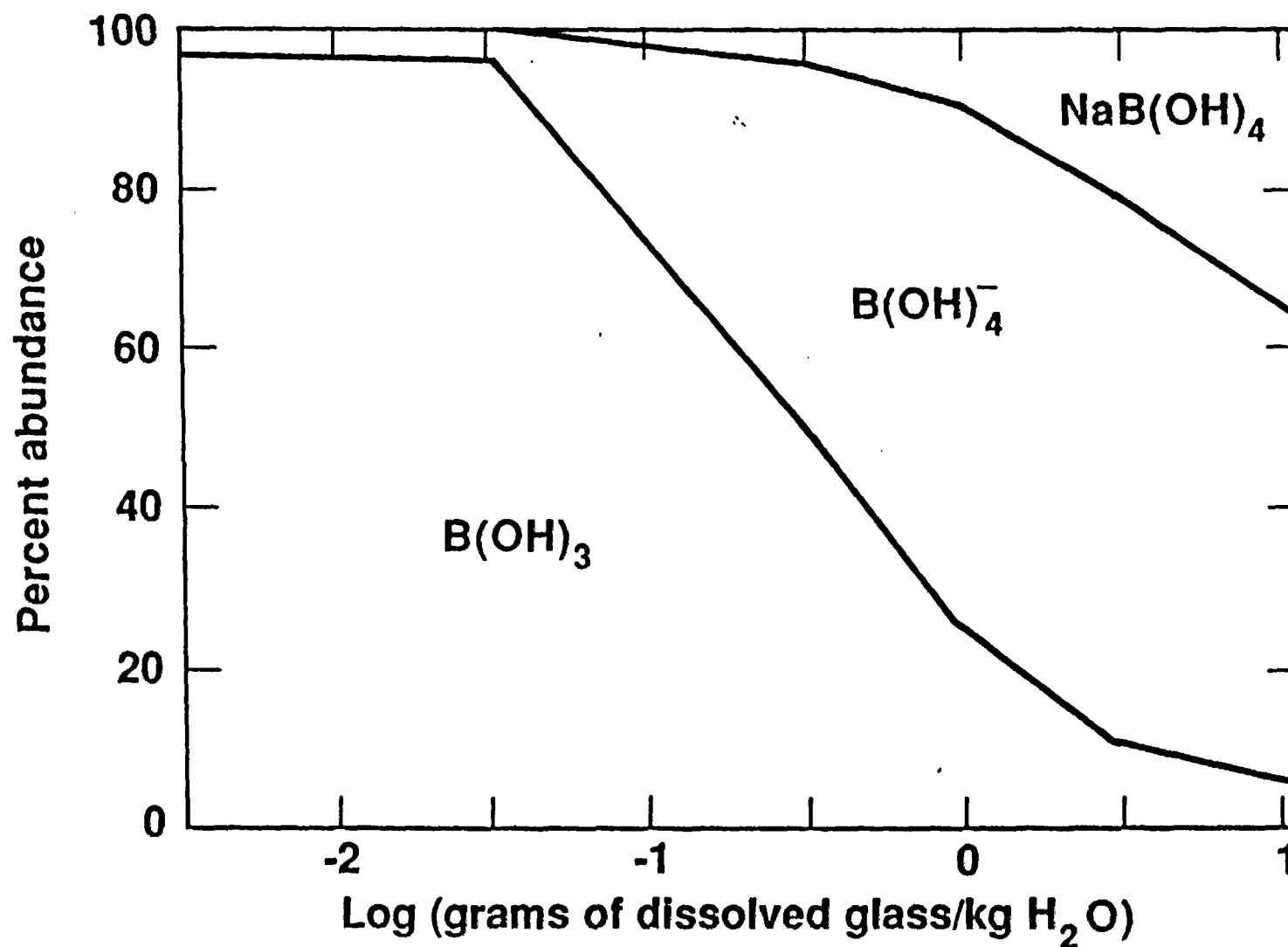
ELEMENT	CONCENTRATION, MG/KG		
	J-13	GRAMS OF DISSOLVED GLASS/KG H ₂ O	
		4	11.55
NA	43.9	373.4	812.2
CA	12.5	0.055	0.073
LI	0.042	2.1	1.1
B		106.3	301.6
SI	27.0	35.2	70.9

SRL 165 FRIT 90°C



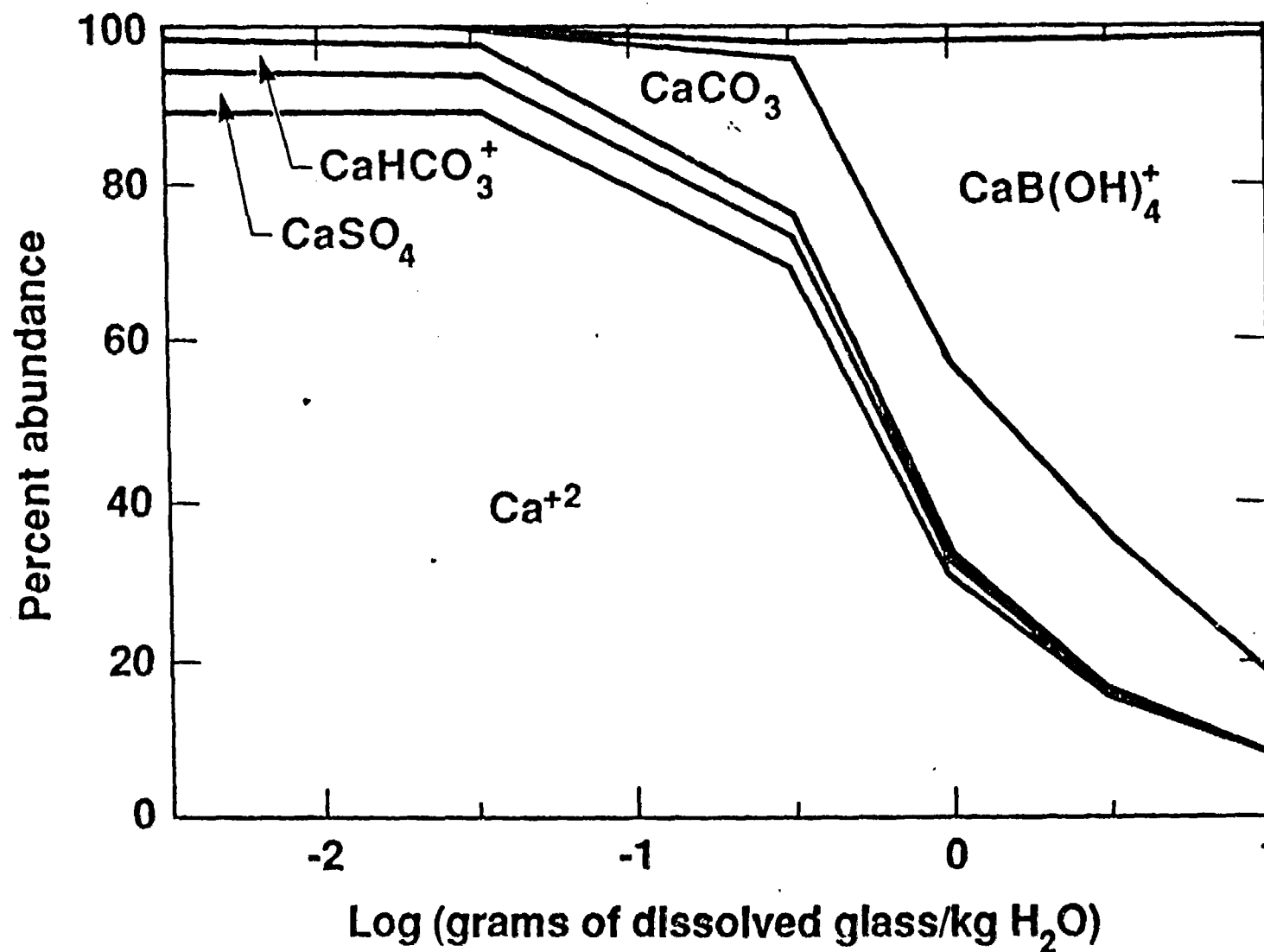
SRL 165 FRIT

B Speciation 90°C



SRL 165 FRIT

Ca Speciation 90°C



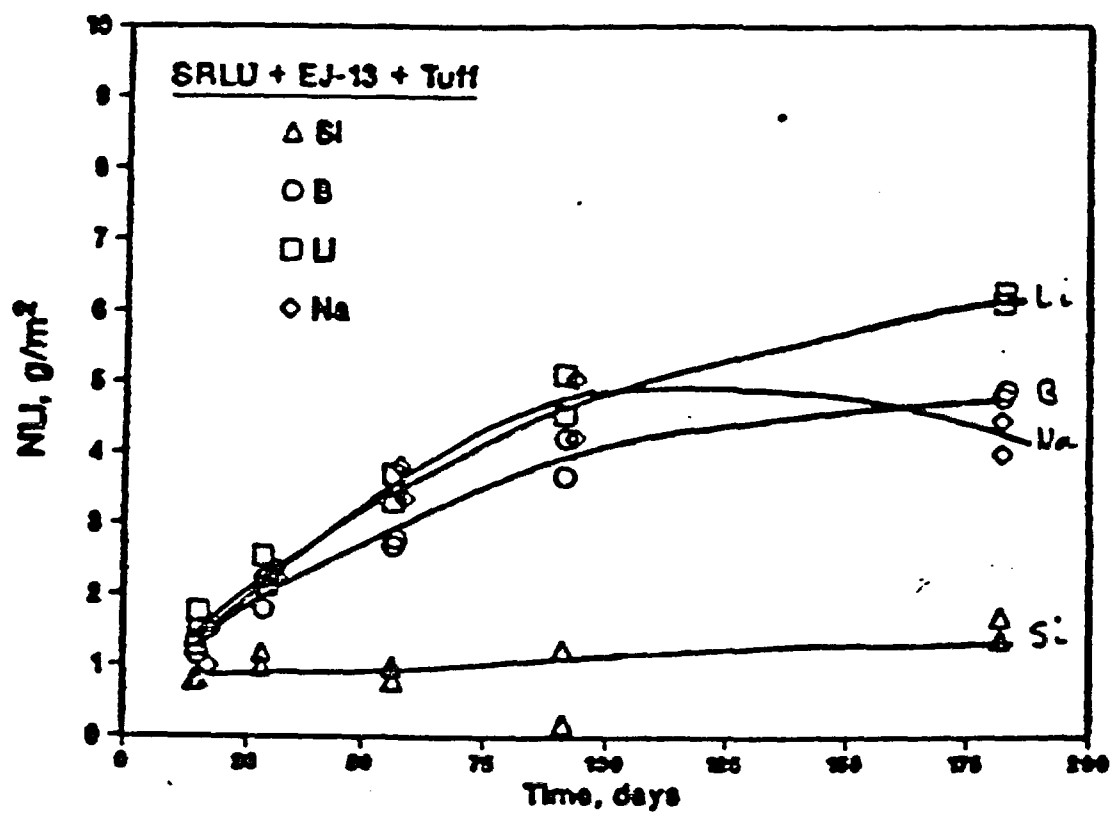
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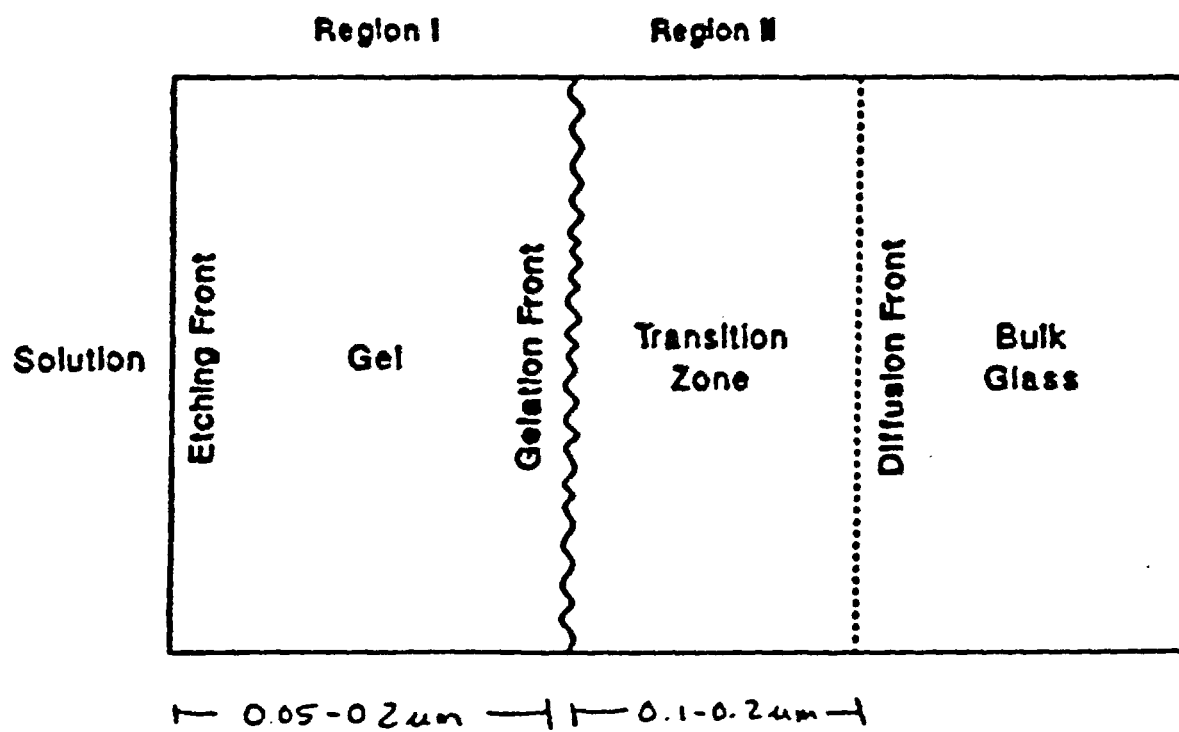
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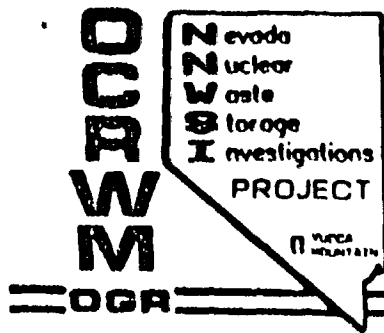
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CONCLUSIONS

- RADIONUCLIDES ARE SEQUESTERED BY OXIDES, HYDROXIDES AND SILICATES
- SOLID PRECIPITATES LIMIT RADIONUCLIDE CONCENTRATIONS IN SOLUTION
- SOLUTION COMPOSITIONS VARY SIGNIFICANTLY DURING GLASS WASTE FORM DISSOLUTION







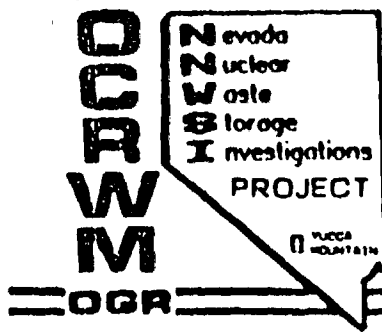
DISSOLUTION PROCESSES

- dissolution (etching)
- hydrolysis (ion exchange)
- diffusion
- hydration (gelation)
- precipitation of secondary phases

DISSOLUTION MODEL



- Hydration Theory - used to calculate glass dissolution affinity.
- Dissolution Kinetics - form of equation consistent with transition state theory.
- Precipitation of secondary phases.



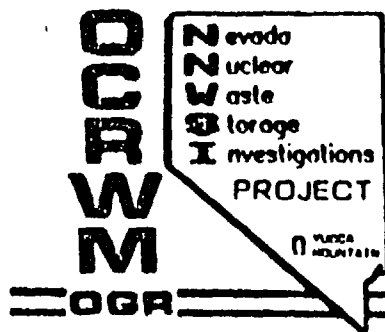
HYDRATION THEORY

A theoretical method for estimating the ΔG_f° of a glass.

The glass is treated as the sum of chosen oxide or silicate components.

Here:

- We have chosen a different set of components.
- We have used an ideal solid solution model rather than mechanical mixture of components.



DISSOLUTION KINETICS

- Rate Law:

$$\frac{dc_i}{dt} = \frac{A}{V} \nu k_+ (a_{H^+})^n (1 - e^{\Delta G/RT})$$

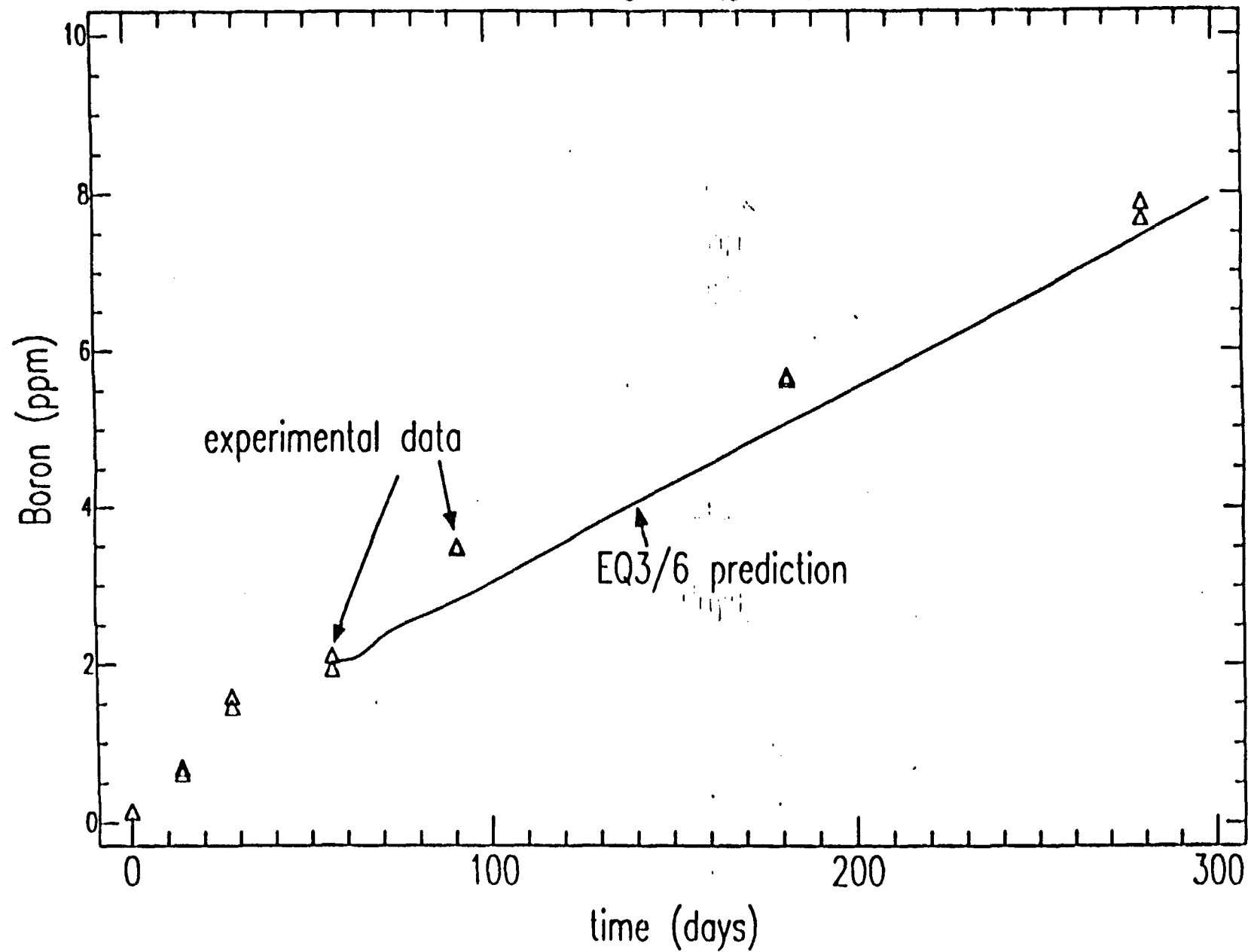
A/V surface area over volume

k_+ rate constant

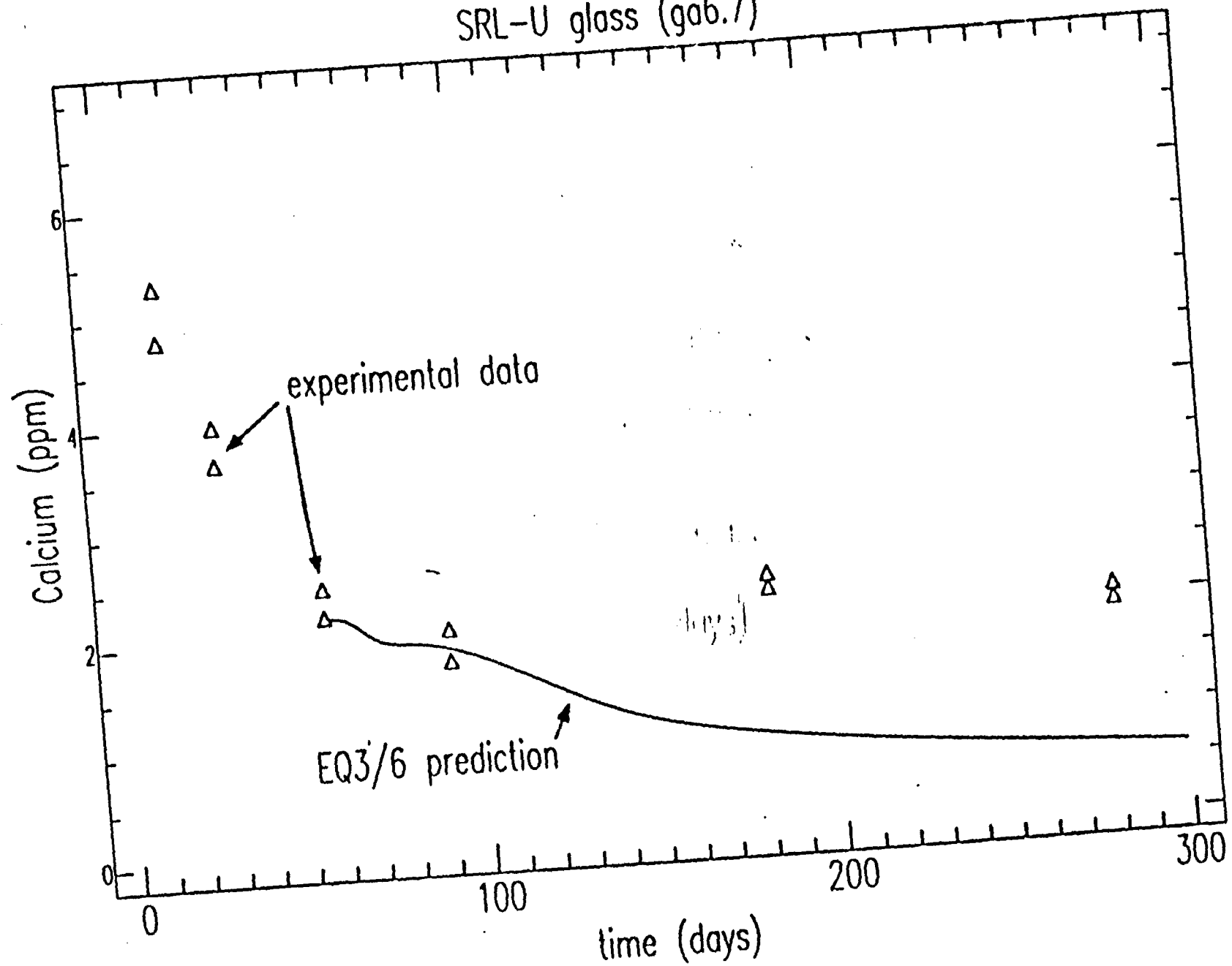
$\Delta G/RT$ affinity to dissolve

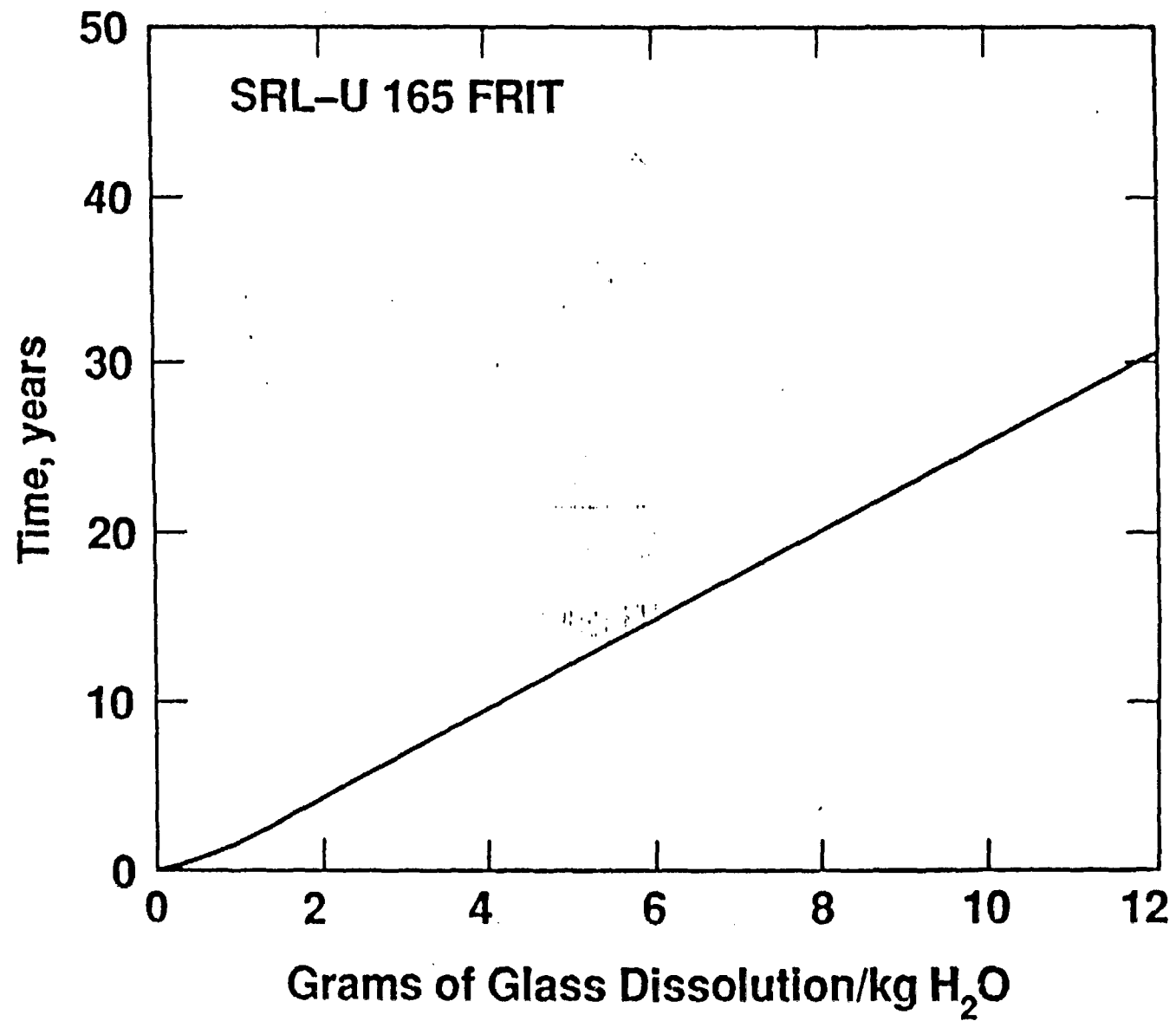
ν stoichiometric factor

SRL-U glass (ga6.9)



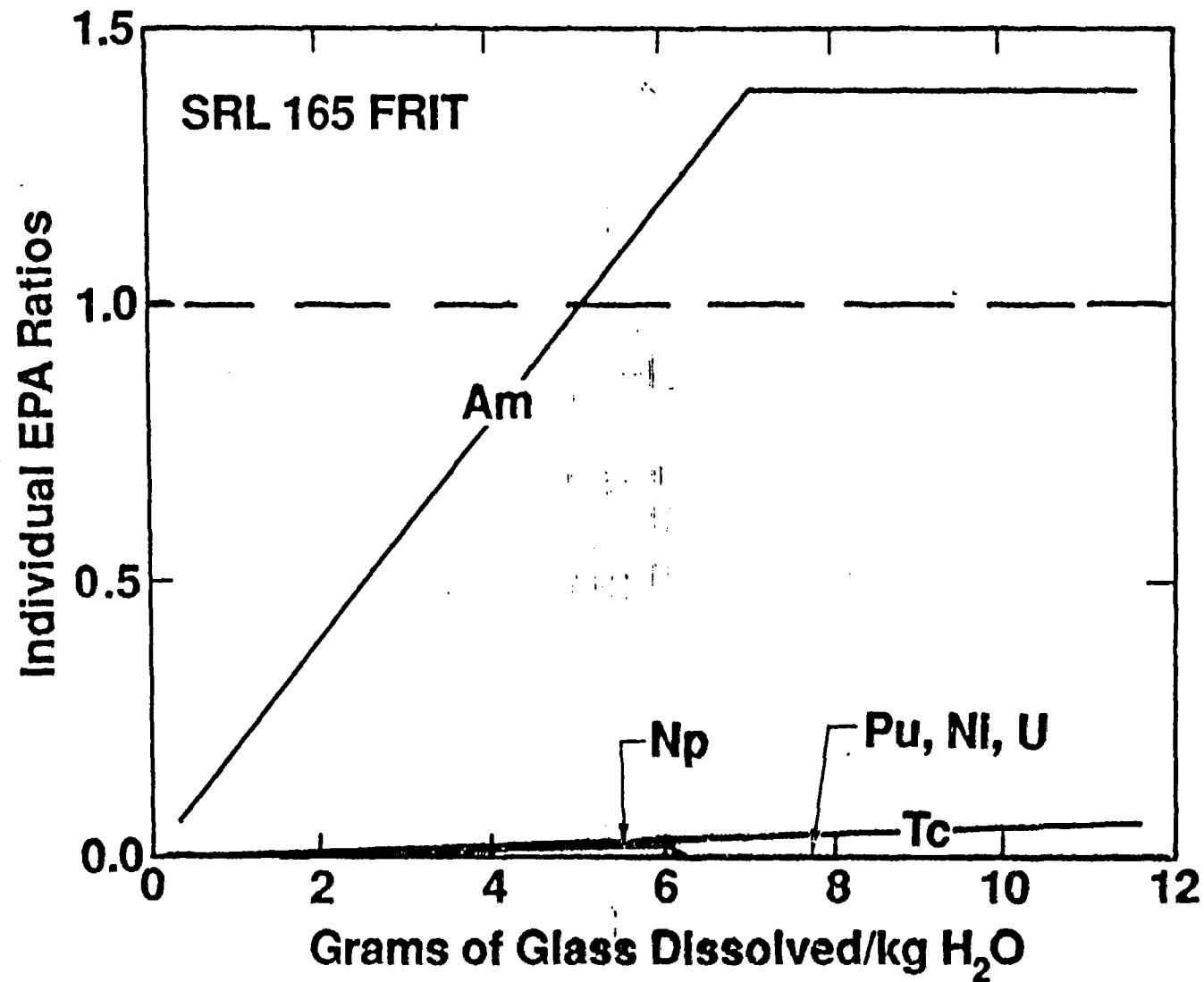
SRL-U glass (ga6.7)





EQ6 SIMULATION RESULTS

Contributions to EPA limits



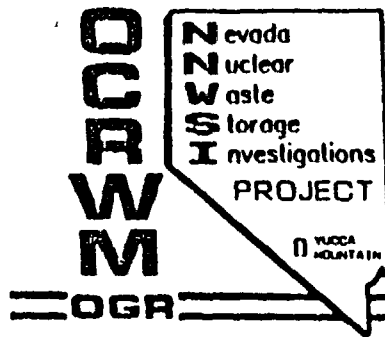
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VALIDATION

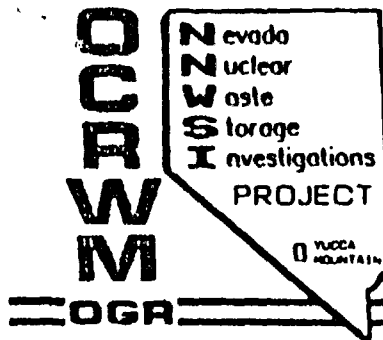
VALIDATION WILL SHOW THAT THE COMBINATION OF A CONCEPTUAL MODEL OF THE SYSTEM, WITH THE EQ3/6 CODE AND RELEVANT DATABASE, CAN BE USED TO CORRECTLY PREDICT WHAT WILL HAPPEN IN THE REPOSITORY.



VALIDATION TESTS COMBINED ASPECTS OF
EQ3/6-BASED MODELS

GEOCHEMICAL MODELING IS PREDICATED UPON THE LAWS OF THERMODYNAMICS, AND THE AVAILABILITY OF ESTABLISHED THERMODYNAMIC DATA. RELEASE CALCULATIONS ARE BASED ON A CONCEPTUAL MODEL OF RELEASE MECHANISMS DERIVED FROM EXPERIMENTAL WORK. THESE ARE COMBINED IN A RELEASE MODEL, AND MUST BE VALIDATED TOGETHER TO DEMONSTRATE THAT THE MODEL GIVES THE CORRECT ANSWER.

INDIVIDUAL ASPECTS OF THE MODEL MAY ALSO BE VALIDATED SEPARATELY FOR INSTANCE, PU SPECIATION IN NATURAL WATERS. THESE SPECIFIC VALIDATION EXERCISES ADD CONFIDENCE IN THE OVERALL VALIDATION, BUT ARE NOT ADEQUATE BY THEMSELVES.

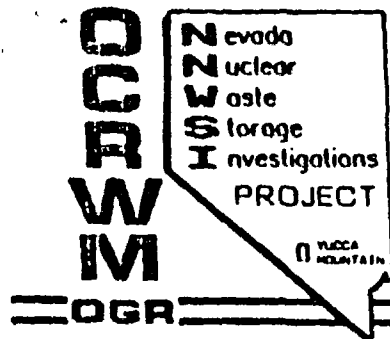


HOW DOES VALIDATION OCCUR?

IN EACH VALIDATION STEP, A SPECIFIC PARAMETER OR SET OF PARAMETERS IS IDENTIFIED FOR PREDICTION BY THE EQ3/6-BASED MODEL.

OTHER ASPECTS OF THE SYSTEM NOT TO BE PREDICTED MUST BE VERY WELL UNDERSTOOD (E.G., TEMPERATURE, HYDROLOGY, INITIAL CHEMISTRIES).

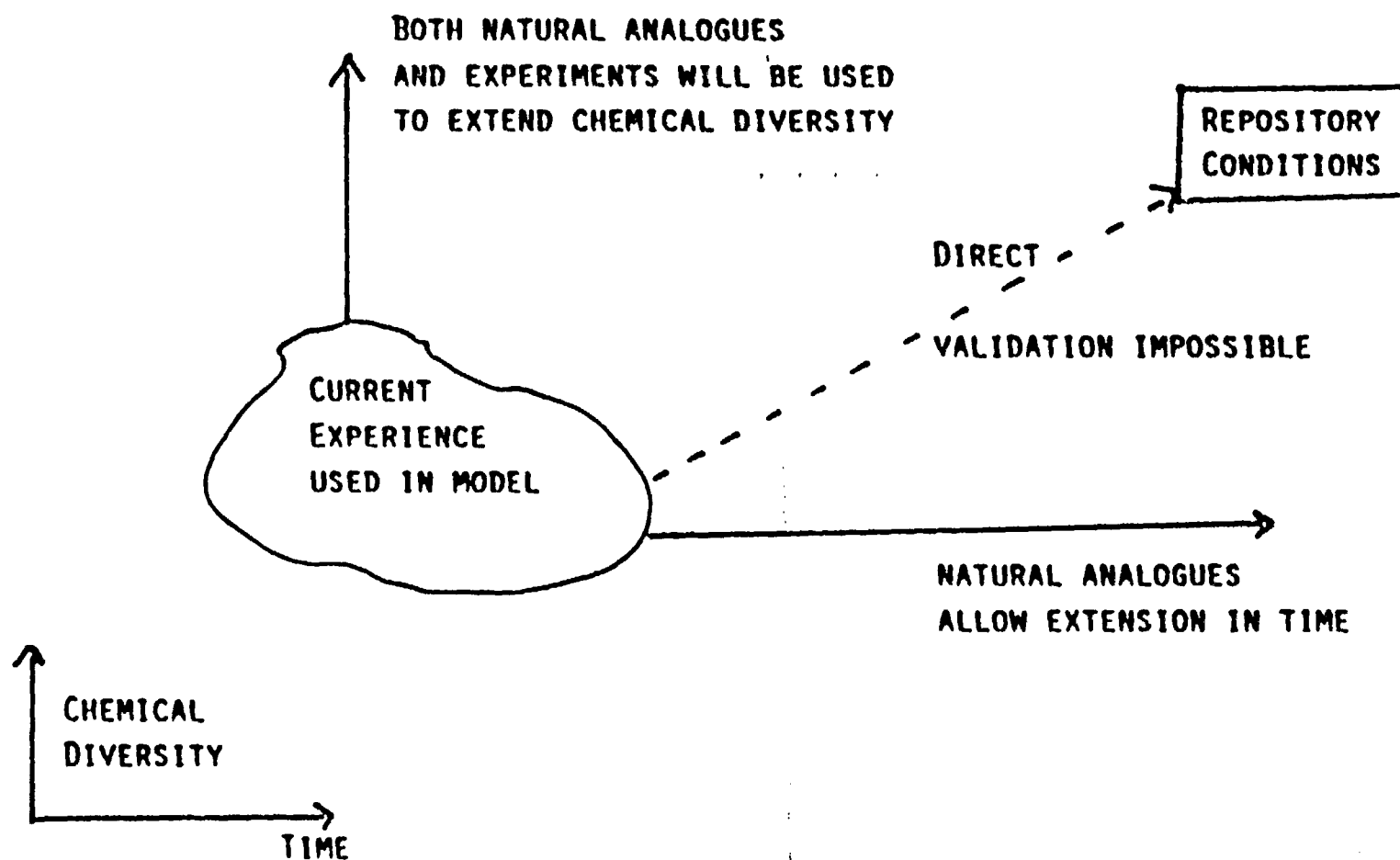
A PEER-REVIEWED VALIDATION PLAN, INCLUDING PREDICTED VALUES AND ALLOWABLE RANGES, IS PREPARED BEFORE ANY VALIDATION WORK IS CONDUCTED.

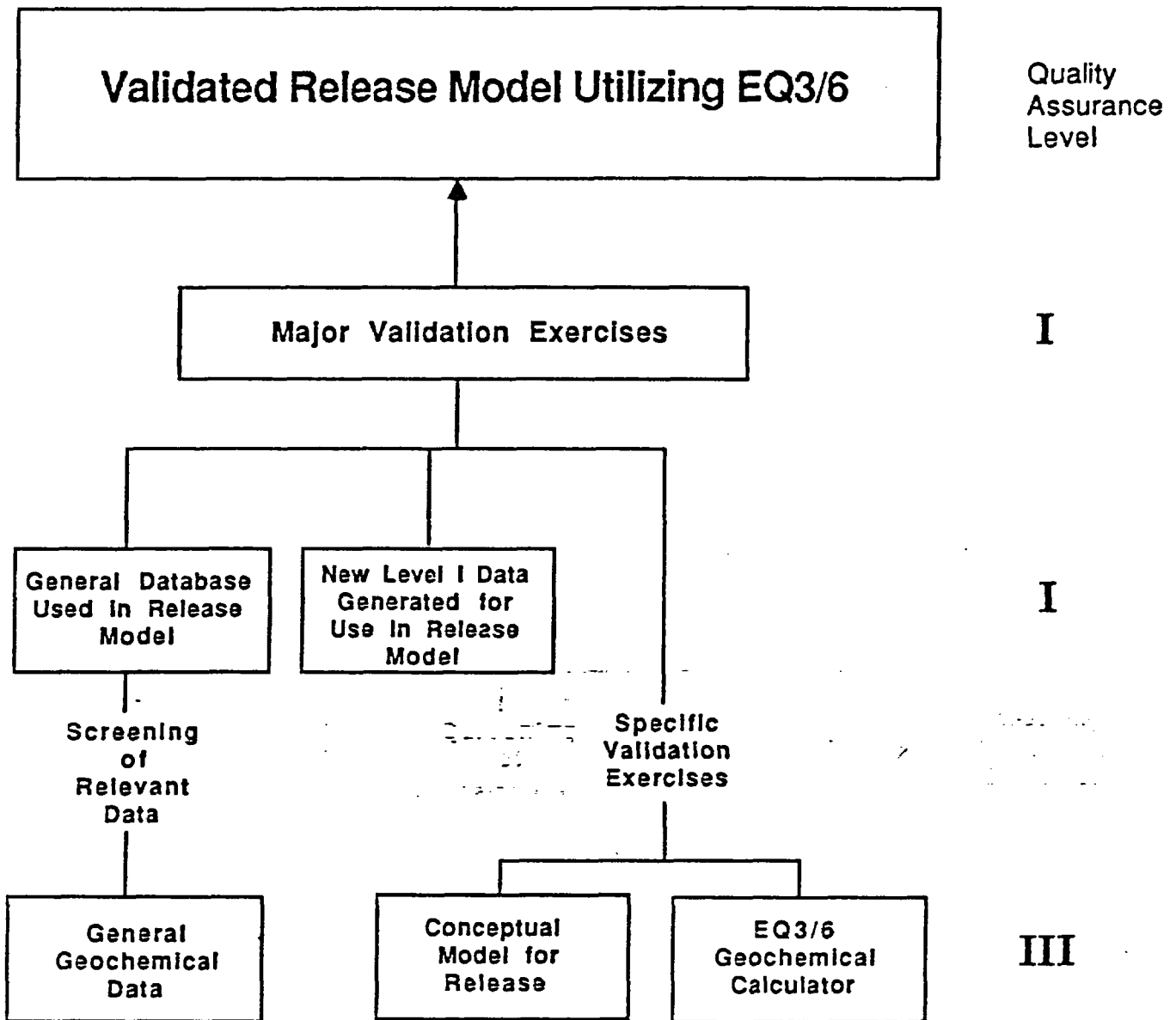


STAGES IN VALIDATION OF RELEASE MODEL

- DATA MUST BE SHOWN TO BE APPROPRIATE, COMPLETE, AND ACCURATE.
- MODEL MUST ACCURATELY MATCH LABORATORY EXPERIMENTS; THIS IS EXTENSIVELY ADDRESSED DURING MODEL DEVELOPMENT.
- MODEL MUST ACCURATELY PREDICT THE RESULTS OF VALIDATION EXERCISES WHICH WERE NOT PART OF THE CREATION OF THE MODEL.

VALIDATION OF THE GLASS RELEASE MODEL WILL USE A COMBINATION OF
ACTIVITIES TO COVER THE EXPECTED RANGES, IN TIME AND CHEMICAL DIVERSITY





QA Levels and Validation for Glass Release Modeling

**O
C
R
W
M
OGR**

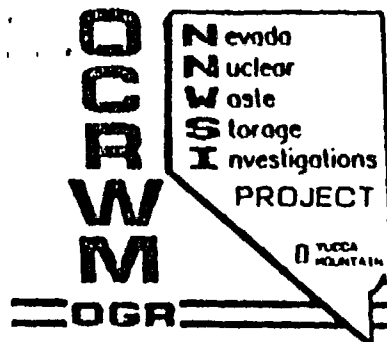
Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

MAJOR VALIDATION EXERCISES

THERE ARE THREE WASTE PACKAGE AREAS THAT WILL USE EQ3/6 MODELING --
SPENT FUEL, GLASS, PACKAGE ENVIRONMENT. THE MODELS FOR THOSE AREAS WILL BE
JOINTLY VALIDATED USING ALL OR PART OF FOUR MAJOR VALIDATION EXERCISES
COVERING:

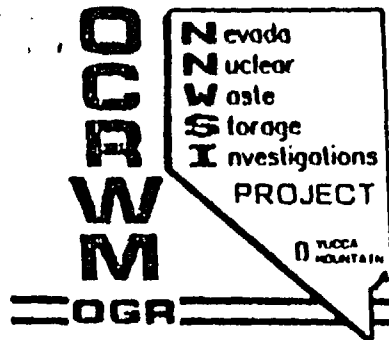
- O CODE OPERATION AND DATA FOR ROCK-FORMING ELEMENTS
- O SPENT FUEL RELEASE MODEL
- O GLASS RELEASE MODEL
- O RADIONUCLIDE BEHAVIOR



CODE OPERATION VALIDATION

MANY ASPECTS OF EQ3/6 MODELING ARE UTILIZED BY BOTH WASTE FORM AND PACKAGE ENVIRONMENT MODELS. THESE INCLUDE BASIC CODE OPERATION, AND DATA FOR MAJOR ELEMENTS SUCH AS SI, AL, NA, ETC.

A POTENTIAL MAJOR VALIDATION AREA FOR THIS WOULD BE TO PREDICT SOLUTION AND SOLID CHEMISTRIES IN A LOW-TEMPERATURE HYDROTHERMAL FIELD, IN WHICH THE PHYSICAL PARAMETERS OF THE SYSTEM (PRESSURE, TEMPERATURE, HYDROLOGY) ARE WELL KNOWN. YELLOWSTONE IS ONE SUCH AREA.

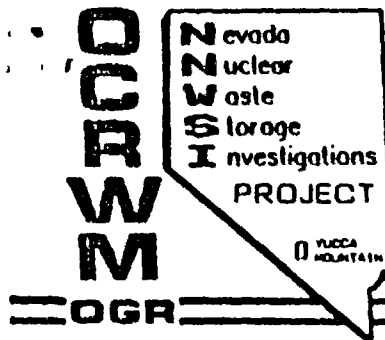


SPENT FUEL AND GLASS RELEASE MODEL VALIDATIONS

THE GLASS AND SPENT FUEL RELEASE MODELS REQUIRE VALIDATION OF THE MODELS FOR WASTE MATRIX BREAKDOWN AND RESULTING SOLUTION COMPOSITIONS.

THE MOST DIFFICULT CHALLENGE FOR THE RELEASE MODELS IS TO PROVE THAT THE MODEL ACCURATELY PREDICTS THE RESULTS OF TIME, WHICH CANNOT BE FULLY TESTED IN THE LABORATORY.

APPROPRIATE NATURAL ANALOGUES THAT ADDRESS THE TIME REVOLUTION OF THE WASTE FORMS ARE NATURAL VOLCANIC GLASSES AND URANIUM DEPOSITS. THE VALIDATION EXERCISE WOULD PREDICT SOLUTION COMPOSITIONS IN CONTACT WITH THE WASTE-ANALOGUE AS A FUNCTION OF TIMES UP TO 100,000 YEARS.



RADIONUCLIDE BEHAVIOR VALIDATION

BECAUSE RADIONUCLIDE CONCENTRATIONS IN SOLUTION ARE THE MOST IMPORTANT OUTPUT OF RELEASE MODELING, WE NEED TO SPECIFICALLY ADDRESS THIS IN VALIDATION.

MANY OF THE MOST IMPORTANT RADIONUCLIDES ARE NOT FOUND IN NATURE IN SIGNIFICANT CONCENTRATIONS (ESPECIALLY PU, AM, AND TC).

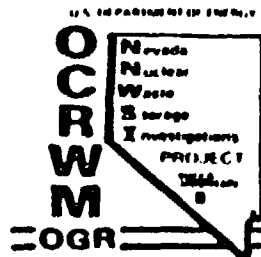
A POSSIBLE AREA FOR THE VALIDATION OF RADIONUCLIDE BEHAVIOR IS TO PREDICT THE CONCENTRATIONS AND SPECIATION OF RADIONUCLIDES RELEASED AS A RESULT OF UNDERGROUND NUCLEAR TESTING.



TECHNICAL DATA BASE STATUS JULY 1987



PARTICIPANT	LATEST MONTHLY RECEIVED	MONTHLY SUMMARY PROVIDED	TECHNICAL RECORDS CENTER INPUT (APPENDIX A)	TECHNICAL DATA BASE INPUT (APPENDIX B)	REFERENCE INFORMATION BASE INPUT (APPENDIX C)
LANL	JUNE 87	NO	0 SUBMITTED 0 ENTERED 0 CLOSED	0 CANDIDATES 0 SUBMITTED	0 CANDIDATES 0 SUBMITTED
USGS	JUNE 87	YES	0 SUBMITTED 0 ENTERED 0 CLOSED	0 CANDIDATES 0 SUBMITTED 0 ENTERED	0 CANDIDATES 0 SUBMITTED
LLNL	APR 87	YES	1 SUBMITTED 0 ENTERED 0 CLOSED	0 CANDIDATES 0 SUBMITTED	0 CANDIDATES 0 SUBMITTED
SNL	JUNE 87	YES	4 SUBMITTED 4 ENTERED 0 CLOSED	0 CANDIDATES 0 SUBMITTED 2 ENTERED	12 CANDIDATES 2 SUBMITTED 0 ENTERED
SAIC	MAY 87	YES	0 SUBMITTED 0 ENTERED 0 CLOSED	0 CANDIDATES 0 SUBMITTED	0 CANDIDATES 0 SUBMITTED
F&S	JUNE 87	YES	0 SUBMITTED 0 ENTERED 0 CLOSED	0 CANDIDATES 8 SUBMITTED	0 CANDIDATES 0 SUBMITTED
H&N	JUNE 87	YES	0 SUBMITTED 0 ENTERED 0 CLOSED	0 CANDIDATES 2 SUBMITTED	0 CANDIDATES 0 SUBMITTED
REECO	JUNE 87	NO	0 SUBMITTED 0 ENTERED 0 CLOSED	0 CANDIDATES 0 SUBMITTED	0 CANDIDATES 0 SUBMITTED

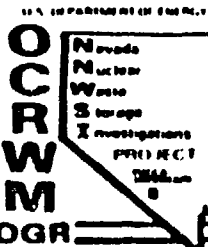


TECHNICAL DATA BASE STATUS TOTAL INPUT SINCE JANUARY 1, 1987



PARTICIPANT	TECHNICAL DATA BASE INPUT	REFERENCE INFORMATION BASE INPUT
LANL	1 SUBMITTED 0 ENTERED	0 SUBMITTED 0 ENTERED
USGS	26 SUBMITTED 14 ENTERED	0 SUBMITTED 0 ENTERED
LLNL	0 SUBMITTED 0 ENTERED	0 SUBMITTED 0 ENTERED
SNL	2 SUBMITTED 0 ENTERED	118 SUBMITTED 83 ENTERED*
SAIC	2 SUBMITTED 0 ENTERED	0 SUBMITTED 0 ENTERED
F&S	9 SUBMITTED 9 ENTERED	0 SUBMITTED 0 ENTERED
H&N	1 SUBMITTED 0 ENTERED	0 SUBMITTED 0 ENTERED
REECO	0 SUBMITTED 0 ENTERED	0 SUBMITTED 0 ENTERED

*RIB version 02.001 containing 83 entries was issued 5/7/87.

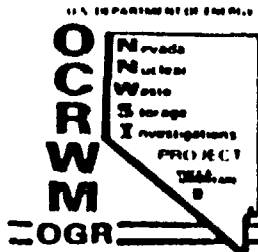


DATA SUBMITTED VIA A BASELINE CHANGE REQUEST (BCR)
FOR CONSIDERATION AS INPUT TO THE RIB*
JULY 22, 1987



RIBCR	Submit Date	Participant	Subject	Status
SNL0001	5/7	SNL	Establishes RIB version 02.001 as SNL change-controlled base version.	Approved
SNL0002	5/18	SNL	Pressure Head vs. Well Number	Review
SNL0003	5/18	SNL	Proposed Fault Location	Approved
SNL0004	5/21	SNL	Disturbed Zone/Engineered System	Development
SNL0005	6/5	SNL	Plan View and Cross Sections of Proposed Repository Location	Development
SNL0006	6/9	SNL	Water Sources	Combined w/SNL0007
SNL0007	6/9	SNL	Water Usage and Aquifer Yield	Review
SNL0008	6/9	SNL	Employment Statistics	Review
SNL0009	6/9	SNL	Aquifer Depth	Development

* The RIB is currently under internal SNL change control, as described in SNL Department Operating Procedure 3-8. Until the RIB is baselined by the Project, candidate information may be submitted to the Systems Engineering Integration Group representatives with a RIB Change Request form.



DATA SUBMITTED VIA A BASELINE CHANGE REQUEST (BCR)
FOR CONSIDERATION AS INPUT TO THE RIB*
JULY 22, 1987



RIBCR	Submit Date	Participant	Subject	Status
SNL0010	6/19	SNL	Excavated Tuff Properties	Approved
SNL0011	6/19	SNL	Exploratory Shaft Data	Combined w/SNL0015
SNL0012	6/19	SNL	Ramp and Shaft Airflows	"
SNL0013	6/19	SNL	Ramp and Shaft Locations	"
SNL0014	6/19	SNL	Exploratory Shaft Cross Section	"
SNL0015	6/19	SNL	ESF Layout and Interface Control	Review
SNL0016	6/19	SNL	Mining and Waste Emplacement Operation Schedules	Review
SNL0017	6/25	SNL	Evapotranspiration	Approved
SNL0018	7/9	SNL	Site Access	Approved
SNL0019	7/9	SNL	Flood location	Approved

* The RIB is currently under internal SNL change control, as described in SNL Department Operating Procedure 3-8. Until the RIB is baselined by the Project, candidate information may be submitted to the Systems Engineering Integration Group representatives with a RIB Change Request form.



STATUS OF TPO-AUTHORIZED DATA SUBMITTALS
 NNWSI TECHNICAL DATA BASE (SEPDB)
 JULY 22, 1987



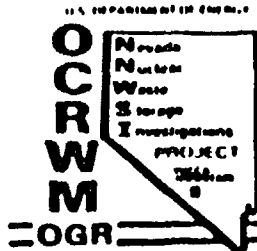
Data Auth. No.	Date Recd.	Parti- cipant	Reference	Status
DA0001	2/87	USGS	WRIR 84-4032	RS/1 table
DA0006	2/87	SAIC	ENV/DB-001; Meterology	no action
DA0007	2/87	SAIC	ENV/DB-002; Meterology	no action
DA0002	4/87	USGS	WRIR 84-4272	RS/1 table
DA0003-I	4/87	USGS	WRIR 84-4193; USW H-1	DE complete
DA0003-A	4/87	USGS	OFR-84-450, UE-25P#1	RS/1 Table
DA0003-B	4/87	USGS	OFR-85-484; Ground Water, Y.M.	DE complete
DA0003-C	4/87	USGS	WRIR 85-4030; USW H-4	RS/1 Table
DA0003-D	4/87	USGS	WRIR 84-4253; UE-25B#1	DE complete
DA0003-E	4/87	USGS	OFR-84-063; USW G-4	RS/1 Table
DA0003-F	4/87	USGS	WRIR 84-4349; Finite-Element	not "data"
DA0003-G	4/87	USGS	WRIR 84-4248; UE-25P#1	DE complete
DA0003-H	4/87	USGS	WRIR 84-4344; Simulated Effects	DE complete



STATUS OF TPO-AUTHORIZED DATA SUBMITTALS
 NNWSI TECHNICAL DATA BASE (SEPDB)
 JULY 22, 1987



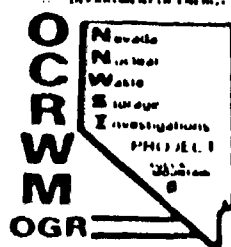
Data Auth. No.	Date Recd.	Parti- cipant	Reference	Status
DA0003-K	4/87	USGS	WRIR 83-4001; Flood Potential	DE complete
DA0003-J	4/87	USGS	WRIR 83-4171; J-13	DE complete
DA0003-M	4/87	USGS	OFR 83-542; Recharge	DE complete
DA0003-L	4/87	USGS	OFR-83-853; USW H-5	DE complete
DA0004-F	6/87	USGS	WRIR 84-4267; Hydrology	no action
DA0004-A	6/87	USGS	OFR-83-855; UE-25B#1	no action
DA0004-B	6/87	USGS	OFR-83-856; USW H-6	no action
DA0004-C	6/87	USGS	OFR-84-142; UE-29-A#1, A#2	no action
DA0004-D	6/87	USGS	WRIR 82-4085; 2-D model	no action
DA0004-E	6/87	USGS	WRIR 84-4197; Water Level Data	no action
DA0004-K	6/87	USGS	PP 1329; Vegetation & Climates	no action
DA0004-G	6/87	USGS	WRIR 84-4345; Conceptual Model	no action
DA0004-H	6/87	USGS	WRIR 86-4359; USW VH-1	no action



STATUS OF TPO-AUTHORIZED DATA SUBMITTALS
NNWSI TECHNICAL DATA BASE (SEPDB)
JULY 22, 1987



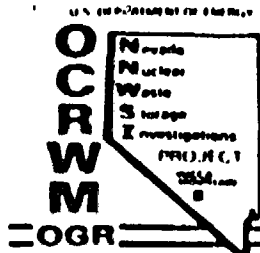
Data Auth. No.	Date Recd.	Parti- cipant	Reference	Status
DA0004-I	6/87	USGS	SGS-1543-3; UE-16D and UE-16F	no action
DA0004-J	6/87	USGS	USGS-1543-4; UE-17A	no action
DA0005	6/87	LANL	LA-10927-MS; Minerals USW G-4	no action
DA0008	6/87	SNL	SAND 85-0703 Topopah Spg, G-2	incomplete
DA0009	6/87	SNL	SAND 86-1131 Mech. prop. of otc	incomplete
DA0010	6/87	F&S	DOE/NV/10322-9, UE-25 a	data entry
DA0011	6/87	F&S	DOE/NV/10322-13; UE-25b#1	data entry
DA0012	6/87	F&S	DOE/NV/10322-14; UE-25c	data entry
DA0013	6/87	F&S	DOE/NV/10322-15; UE-25h#1	data entry
DA0014	6/87	F&S	DOE/NV/10322-16; UE-25p#1	data entry
DA0015	6/87	F&S	DOE/NV/10322-11; UE-25RF	RS/1 table
DA0016	6/87	F&S	DOE/NV/10322-12; UE-29a#1, #2	RS/1 table
DA0017	6/87	F&S	DOE/NV/10322-10; WT	data entry
DA0018	6/87	H&N	Hole locations	just recd
DA0019	7/87	F&S	DOE/NV/10322/17; USW VH	data entry



FLOW OF TECHNICAL DATA PART 1 THE STARTING POINT TECHNICAL RECORDS CENTER JUNE 23, 1987



Sandia National Laboratories

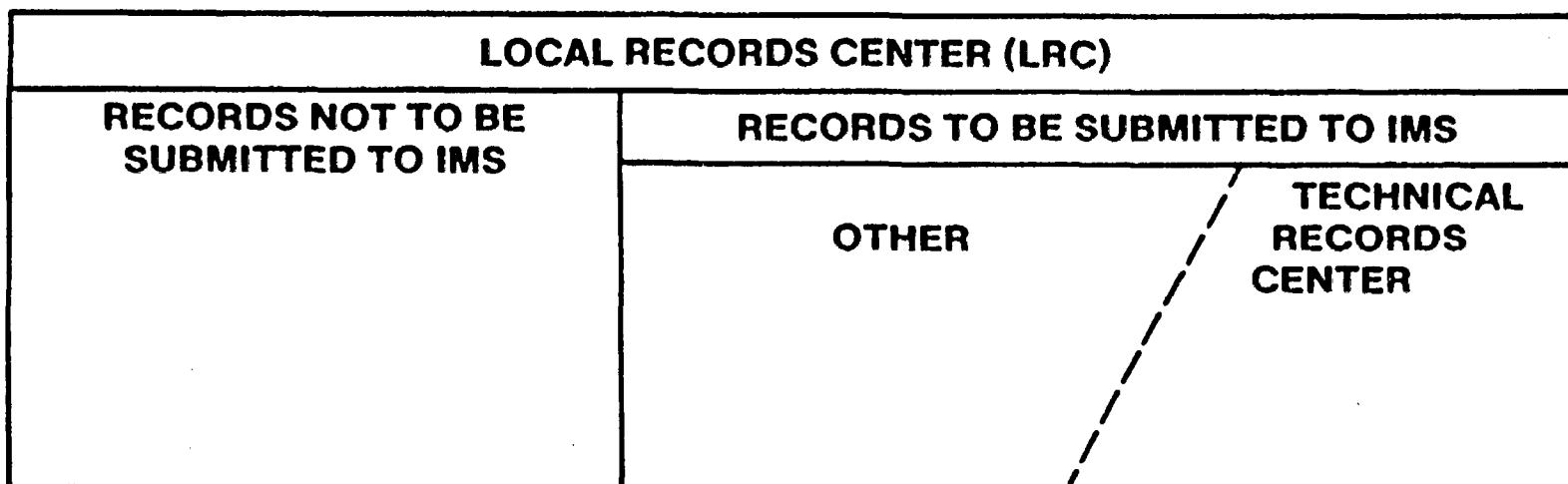
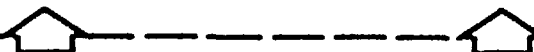
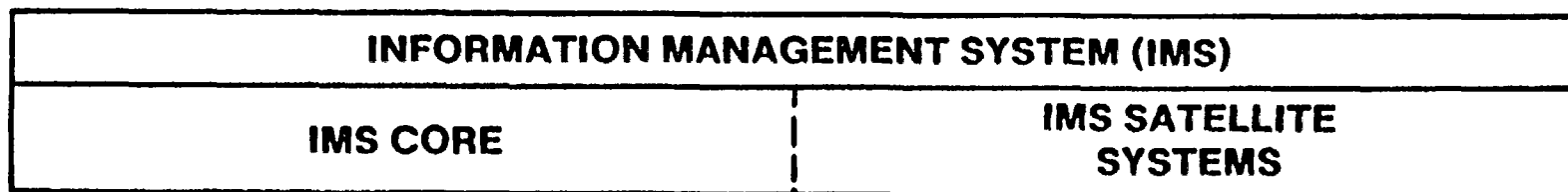


NNWSI PROJECT/OGR/OCRWM RECORDS MANAGEMENT SYSTEM



LICENSING SUPPORT
SYSTEM (LSS)

OCRWM/OGR/PROJECT



PARTICIPANT

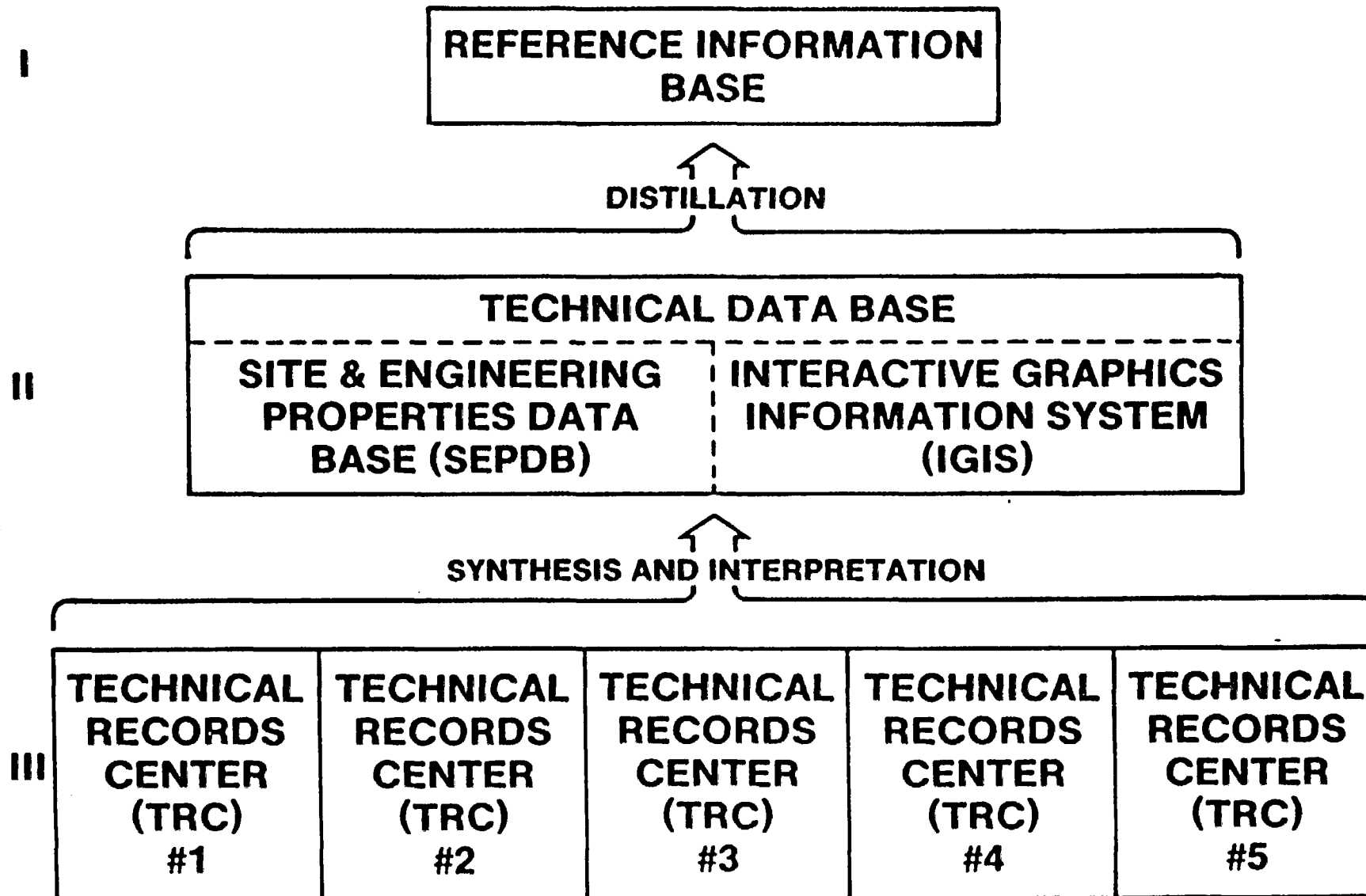


PROJECT ACTIVITIES

TECHNICAL DATA BASE STRUCTURE IN THE NNWSI PROJECT



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ROLE OF DATA /INFORMATION BASES IN IMS



OCRWM TERMINOLOGY

Raw Technical Data Base

**Preliminary Technical
Data Base**

**Project Final Controlled
Technical Data Base**

NNWSI PROJECT TERMINOLOGY

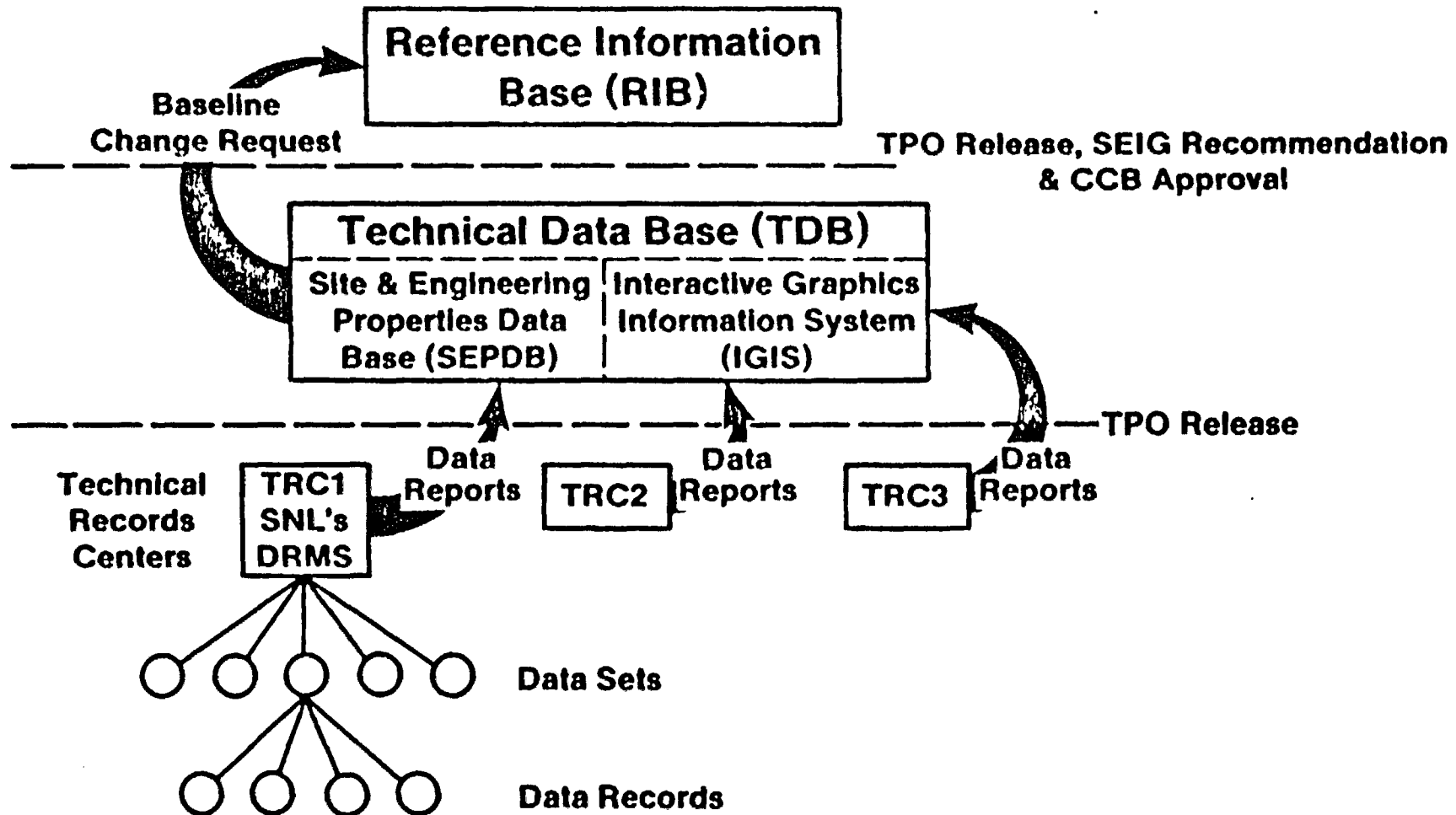
**Technical Records Centers
(TRCs)**

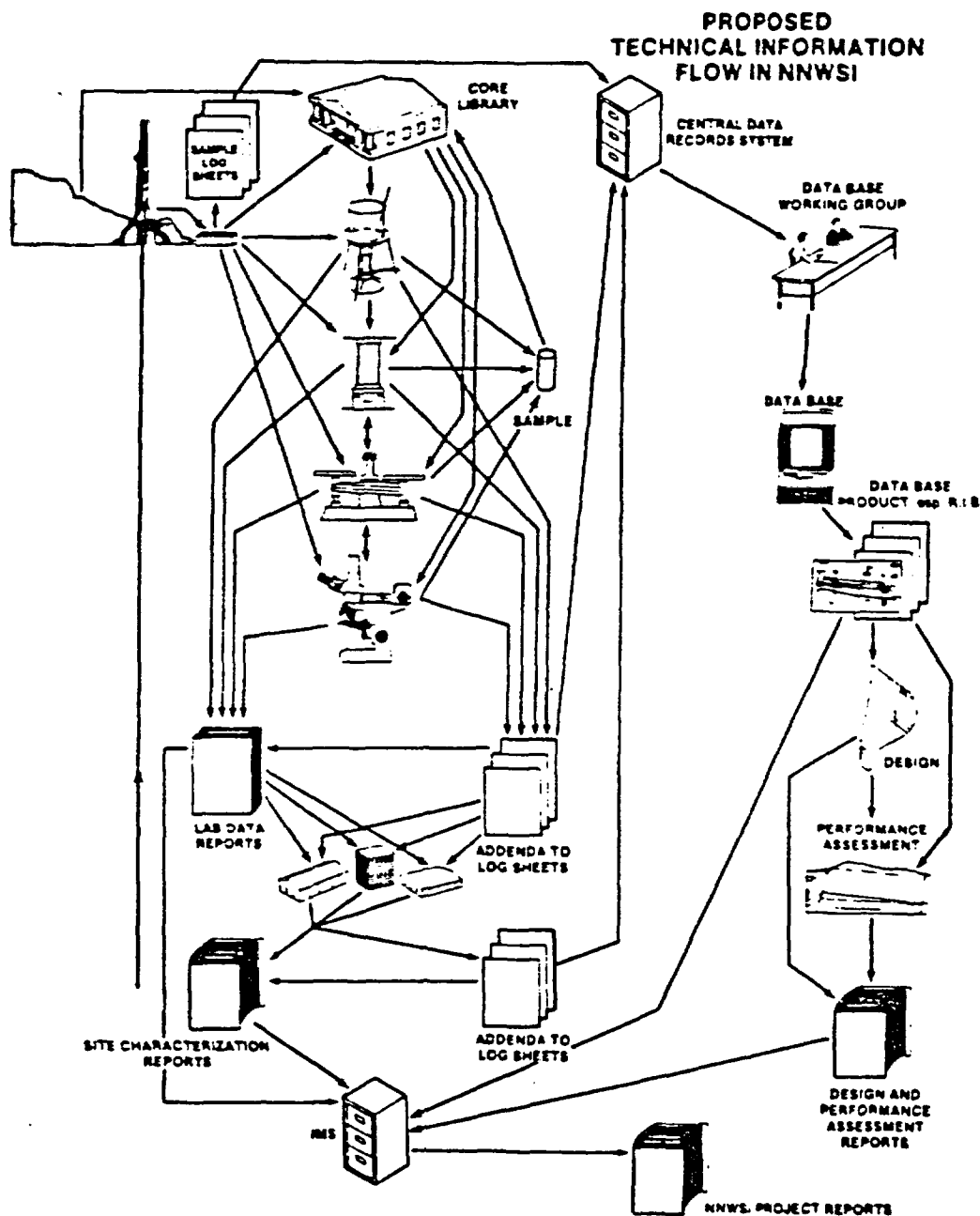
**Technical Data Base
(TDB)**

**NNWSI Project Reference
Information Base (RIB)**

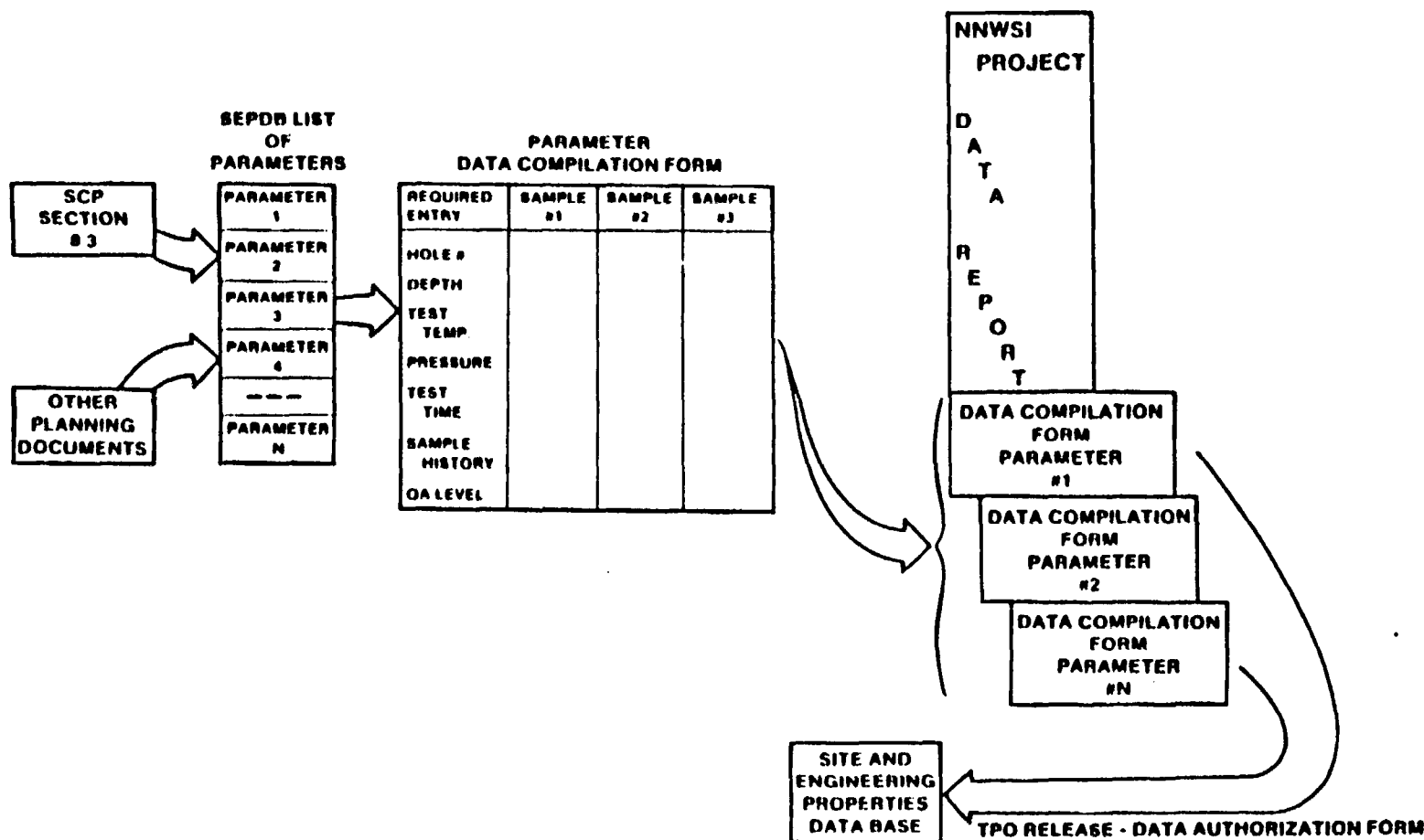
10	ADMINISTRATIVE RECORDS	
20	CONTRACT RECORDS	
30	PROJECT MANAGEMENT INFORMATION	
40	TECHNICAL DATA BASE RECORDS	
50	DATA RECORDS MANAGEMENT SYSTEM	} TECHNICAL RECORDS CENTER
60	DESIGN RECORDS SYSTEM	
70	ANALYSIS RECORDS SYSTEM	
80	PLANNING RECORDS	
90	QA RECORDS	
100	REFERENCE DOCUMENTS	

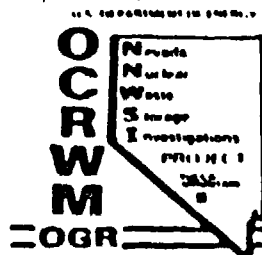
DATA FLOW IN THE NNWSI PROJECT





IDENTIFICATION AND ENTRY OF PARAMETERS INTO THE SEPDB



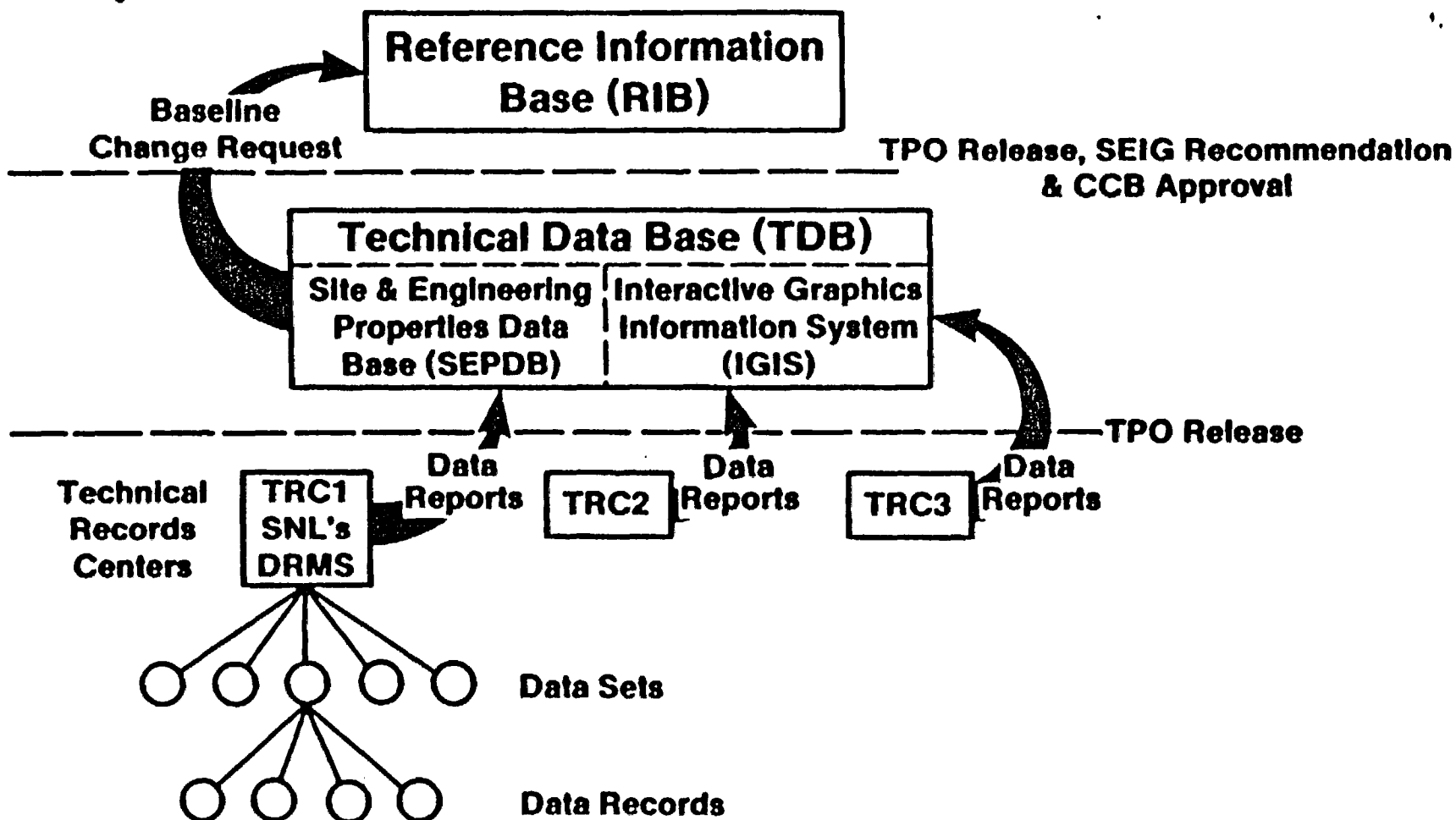


THE SNL NNWSI PROJECT TECHNICAL RECORD CENTER (TRC)



THE DATA RECORDS MANAGEMENT SYSTEM (DRMS)

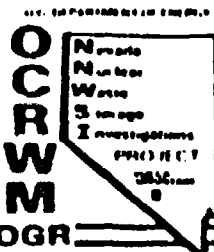
**PRESENTED BY: BARRY M. SCHWARTZ
DRMS COORDINATOR
SNL DIV. 6313
(505) 846-8268**



HOW DOES THE DRMS MEET LICENSING REQUIREMENTS



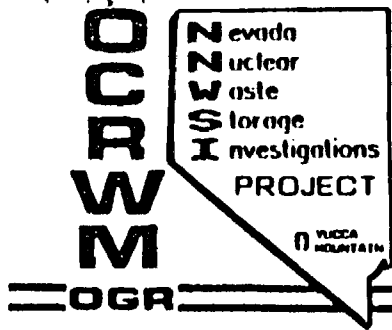
- **Dual facility**
- **Controlled access**
- **Operation controlled by formal procedures:**
 - **Requirements for submittal of records to the DRMS are defined in SNL NNWSI PROJECT DOP 11-3, "DRMS Interaction Requirements".**
 - **Requirements defining operation of the DRMS are defined in DOP 17-02, "Operation of the SNL NNWSI Data Records Management System".**
 - **Users Manual, including documentation of software.**



ORGANIZATION OF THE DRMS



- **DRMS Reference Index**
- **DRMS System Index**
- **Data Sets**
 - **Laboratory Experiments**
 - **Field Experiments**
 - **Equipment Tests**



DRMS FILE GUIDES



51/L01

THERMAL TESTING

51/L02

MECHANICAL PROPERTIES



51/L17

FLOW PHENOMENA

55/F01

GTUF GEOTECHNICAL MEAS.

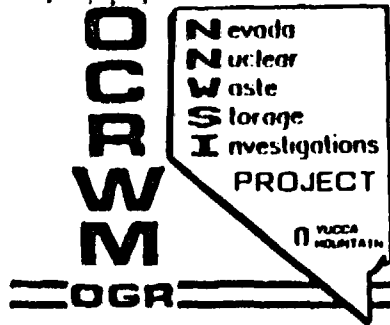
55/F02

SMALL DIAMETER HEATER # 1, 2, 3



55/F16

**EVALUATION OF BOREHOLE STABILITY IN
WELDED TUFFS**



EXAMPLE OF DRMS DATA-SET ID



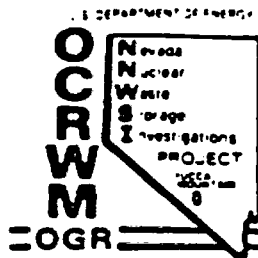
DATA-SET ID

51/L02-4/6/87

51 SNL NNWSI PROJECT LOCAL RECORDS CENTER
FILE FOR DRMS LABORATORY EXPERIMENTS

L02- FILE GUIDE FOR MECHANICAL PROPERTIES
TESTING

4/6/87 DATE OF INITIATION OF DATA-SET



CONTENT OF A DATA SET

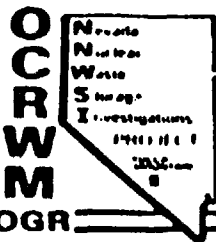


RECORDS IN DRMS DATA SET NOTEBOOKS ARE FILED WITHIN ONE OF THE FOLLOWING 13 SECTIONS:

SECTION

SECTION NAME

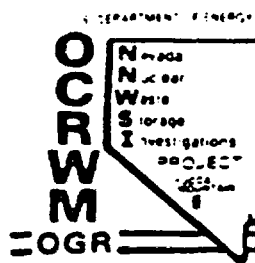
1. Experiment and Equipment-Test Procedures
2. Sample Custody Records/Photographs
3. DRMS Data Index and Tracking Sheets
4. Correspondence
5. Sample and/or Site Preparation Records
6. Technical Procedures
7. Data
8. Calibration Records
9. Analysis of Results
10. Instrumentation/Data Acquisition Records
11. Quality Assurance Documents
12. Supporting Information
13. Reports (Data Reports and Other Reports)



FLOW OF DATA INTO THE DRMS



- **SNL PI request initiation of a Data Set (and corresponding Data-Set ID) prior to the start of data gathering.**
- **PI submits records to the DRMS using the Data-Set ID for distribution of records to the DRMS.**
- **DRMS Records Administrator inputs records into the DRMS Computer Index and files the record into Data-Set Notebooks for both sets of the Dual-Facility DRMS.**



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DOP 17-02
Rev A
App I

DRMS DATA-SET INDEX SHEET

DATA-SET ID		
FILE NAME		
DESCRIPTION		
EP IDENTIFIER		EP SIGN-OFF DATE
EP TITLE		
ACTIVITY #1		
	CA Level	# of samples
ACTIVITY #2		
	CA Level	# of samples
ACTIVITY #3		
	CA Level	# of samples
ACTIVITY #4		
	CA Level	# of samples
ACTIVITY #5		
	CA Level	# of samples
ADDITIONAL DATA SETS TO BE GENERATED FOR THIS EP?		
(IF YES, LIST THEM BELOW)		
		YES NO
DATA-SET ID		DATA-SET ID
SNL	DIVISION	
BY		
SUBMITTED BY	DIVISION	DATE

DRMS Form 5008 Rev 5/5/87

STS-06.87



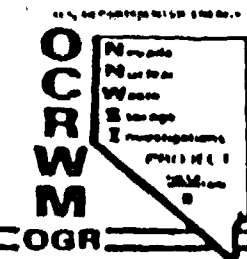
DDP 17-02
Rev A
APP K

DRMS DATA-SET TRACKING SHEET FOR LABORATORY EXPERIMENTS

DATA-SET ID		51-L02-04/06/87	
SUBMITTED BY		B. W. Schwartz for R. W. Price	
		DIW	6313
THE STATUS OF EACH SAMPLE IN A DRMS DATA SET IS EITHER			
Planned (P) - Data acquisition not yet initiated.			
Ongoing (O) - Data acquisition has been initiated.			
Completed (C) - Data acquisition completed.			
Work Cancelled (W) - Work cancelled prior to acquisition of data.			
ACTIVITY NUMBER	SAMPLE ID	STATUS OF SAMPLES AS OF 5/6/87	
1	10AE-31X	O	
1	10AE-5Y	P	
1	10AE-23W	P	
1	10AE-37Z	P	
2	10AE-11Z	P	
2	10AE-20Y	P	
2	10AE-30Z	P	
2	10AE-51W	P	
3	10AE-6Y	P	
3	10AE-36Z	P	
3	10AE-49W	P	
-	10AE-5X	P	
-	10AE-11Y	P	
4	10AE-24Z	P	
LAST ITEM AS OF 5/6/87			

IS THIS LIST CONTINUED ON ANOTHER SHEET? YES ☒ NO (circle one)

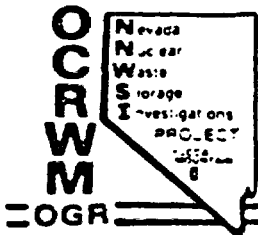
CHECK TO INITIATE CLOSING OF DATA SET. DATE REQUESTED _____



DRMS DATA FLOW



- **Initiation of Data Sets**
 - Documentation of changes to sample custody
- **Development of a Data Catalog**
 - On a quarterly basis, a description and status of all Data Sets is published as an index called The Data Catalog.
 - NRC can request review of data.
- **Control of Data**
- **Source of Data for NNWSI project use.**
 - Technical Data Base (TDB)
 - NNWSI project documents
 - NNWSI project Data Reports
- **Transmittal to IMS**
 - Through SNL NNWSI project Local Record Center (LRC)



INWSI DATA RECORDS MANAGEMENT SYSTEM
SANDIA NATIONAL LABORATORIES

DATA CATALOG

LABORATORY EXPERIMENTS
06/17/87

MATRIX SATURATED PERMEABILITY

SNL CONTACT: Elmer A. Klavetter, Div. 6313

DATA SET ID: SI L 5B1-01/29/81 QA LEVEL: 3 STATUS: Completed

DESCRIPTION: Permeability measurements in support of the Tuff
Radionuclide Migration field experiment.

DATA SET ID: SI L 5B1-05/08/83 QA LEVEL: 3 STATUS: Completed

DESCRIPTION: Determine saturated matrix permeability in support of
hydrologic calculations; data used for preliminary
estimation of hydrology of units above the water table.

DATA SET ID: SI L 5B1-02/23/83 QA LEVEL: 3 STATUS: Completed

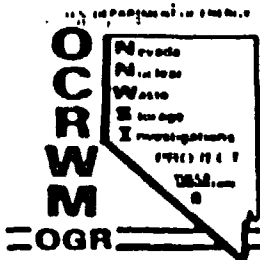
DESCRIPTION: Determine saturated permeability in support of hydrologic
calculations; matrix permeabilities needed in modeling
efforts.

DATA SET ID: SI L 5B1-08/04/83 QA LEVEL: 3 STATUS: Completed

DESCRIPTION: Determine matrix saturated conductivities in support of
hydrology calculations for initial variability
investigations.

DATA SET ID: SI L 5B1-11/01/83 QA LEVEL: 3 STATUS: Completed

DESCRIPTION: Determine saturated permeability of the matrix in support
of hydrologic experiments; analysis used for equipment
check and in determining data variation.

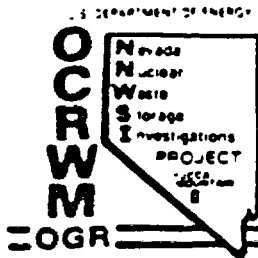


CONTROL OF DATA FOR THE DRMS



REPORTING OF DATA

- The DRMS coordinator must sign a manuscript review sheet indicating that data to be published in Data Reports and other reports have been input to the DRMS prior to the reports publication.



DEPARTMENT 6310 MANUSCRIPT REVIEW SHEET

6310 90/1293.SAN/NQ

Appendix A
to DOP 6-2
(Revised 03/01/97)

SAND _____ Date _____
Title _____
Author(s) and Organization(s) _____
If contractor report, name of Sandia contract monitor and organization _____
If author from outside 6310, name of Dept. contact _____
Type of Manuscript:
() SAND Report
() Journal Article _____ (name of journal)
() Conference Meeting Abstract or Paper _____ (name of conf. meeting)

Please review the attached manuscript for each of the following:

- | | |
|--|---|
| ___ 1. Org. clarity, & conciseness of the material. | ___ 7. Appropriate acknowledgment of contributors and referenced material. |
| ___ 2. Correctness of any assumptions. | ___ 8. Consistency of information with program baseline and reference information, required appendices are present (RIB & SEPDB). |
| ___ 3. Validity of data, incl. statistical significance. | ___ 9. Format, grammar, spelling, punctuation (editorial reviewer). |
| ___ 4. Adequacy of the discussion of variables. | |
| ___ 5. Validity of conclusions & recommendations. | |
| ___ 6. Adequacy of illustrations, graphs, tabular data, etc. | |

Attach any comments you have, initial below, and return the package to the author contract monitor by _____. If you cannot complete your review by that date, please contact the author monitor as soon as possible. Do not complete the signature block until your comments and suggestions are resolved to your satisfaction; your signature indicates your final approval. *

* Reviewer name _____ Org _____ Initials _____
Signature (final approval): _____ Date: _____
* Referee name _____ Org _____ Initials _____
Signature (final approval): _____ Date: _____
* Editorial reviewer _____ Org _____ Initials _____
Signature (final approval): _____ Date: _____
() Editorial review not required _____
Division supervisor signature _____

The manuscript has been reviewed and approved for conformance with Reference Information Base, and identification of candidate information for the SEPDB.

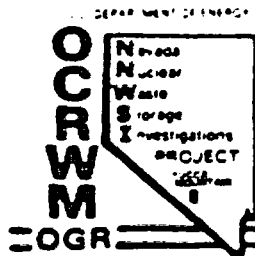
6315 Signature: _____ Date: _____ 6316 Signature: _____ Date: _____

The manuscript has been reviewed by a Data Records Management System (DRMS) representative. All appropriate data and testing information have been provided to and placed into the DRMS.

Data Set ID _____ Signature: _____ Date: _____

Records Management System (RMS) index code _____

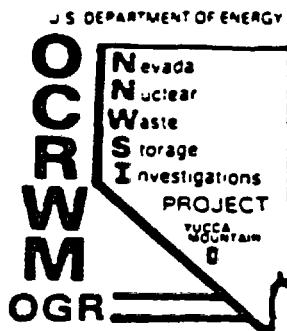
Milestone number _____ Precursor for Level 1 Milestone _____



Sandia
National
Laboratories

SNL NNWSI PROJECT DATA RECORDS MANAGEMENT
SYSTEM (DRMS) DATA-SET CLOSING SHEET

DOP 17-02
App A
Rev 0
Page 1 of 1



DATA-SET ID _____

		COMMENTS - ATTACHED -
DRMS REVIEWED (RA) _____	_____ DATE _____	<input type="checkbox"/>
DRMS REVIEWED (DC) _____	_____ DATE _____	<input type="checkbox"/>
DRMS REVIEWED (PI) _____	_____ DATE _____	<input type="checkbox"/>
ACCEPTED BY _____ 6310 QA COORDINATOR	_____ DATE CLOSED _____	<input type="checkbox"/>

NUMBER OF VOLUMES IN THIS DATA SET: _____

CLASSIFICATION REVIEW 3180

Signature/Initials _____ Date _____

PATENT, LEGAL REVIEW 4121

Patent Interest: ☐ no ☐ yes

Signature/Initials _____ Date _____

PUBLICATION POLICY REVIEW 3151

Signature/Initials _____ Date _____

PRESENTATION TO

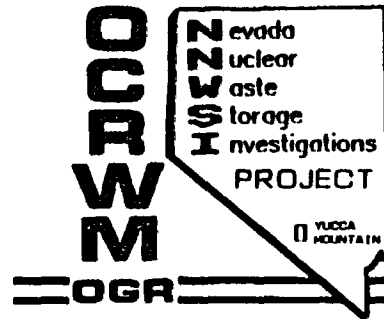
PM/TPO MEETING

ROLE OF THE INTEGRATING CONTRACTOR

PRESENTATION BY

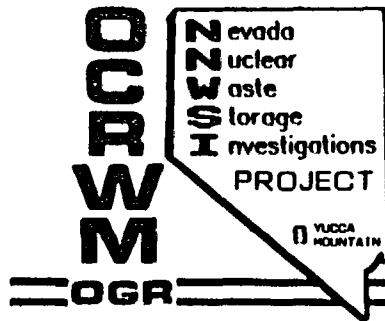
**TECHNICAL AND MANAGEMENT
SUPPORT SERVICES**

JULY 28, 1987



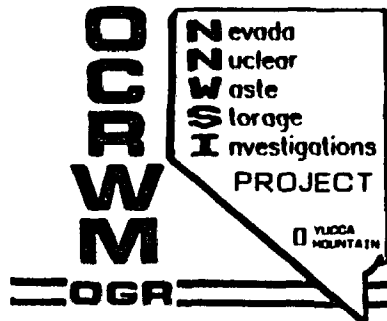
PRESENTATION PURPOSE/ EXPECTED OUTCOME

- **PURPOSE:** PRESENT TECHNICAL APPROACH AND ORGANIZATION
- **EXPECTED OUTCOME:** MUTUAL UNDERSTANDING OF TECHNICAL AND MANAGEMENT APPROACH



MAJOR CONTRACT REQUIREMENTS

- **NNWSI PROJECT INTEGRATION**
- **PROJECT MANAGEMENT SUPPORT**
- **TECHNICAL SUPPORT**



APPROACH

- **NNWSI PROJECT INTEGRATION**

PROVIDED BY T&MSS CONTRACTOR

- **SYSTEMS ENGINEERING**

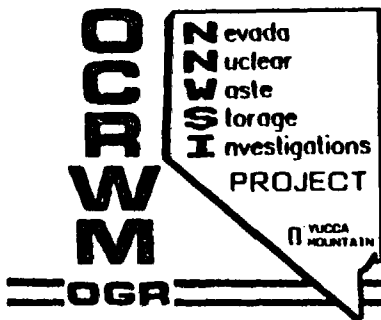
METHOD PROPOSED AROUND WHICH T&MSS IS ORGANIZED FOR PROJECT INTEGRATION AND CONTROL

- **TECHNICAL SUPPORT**

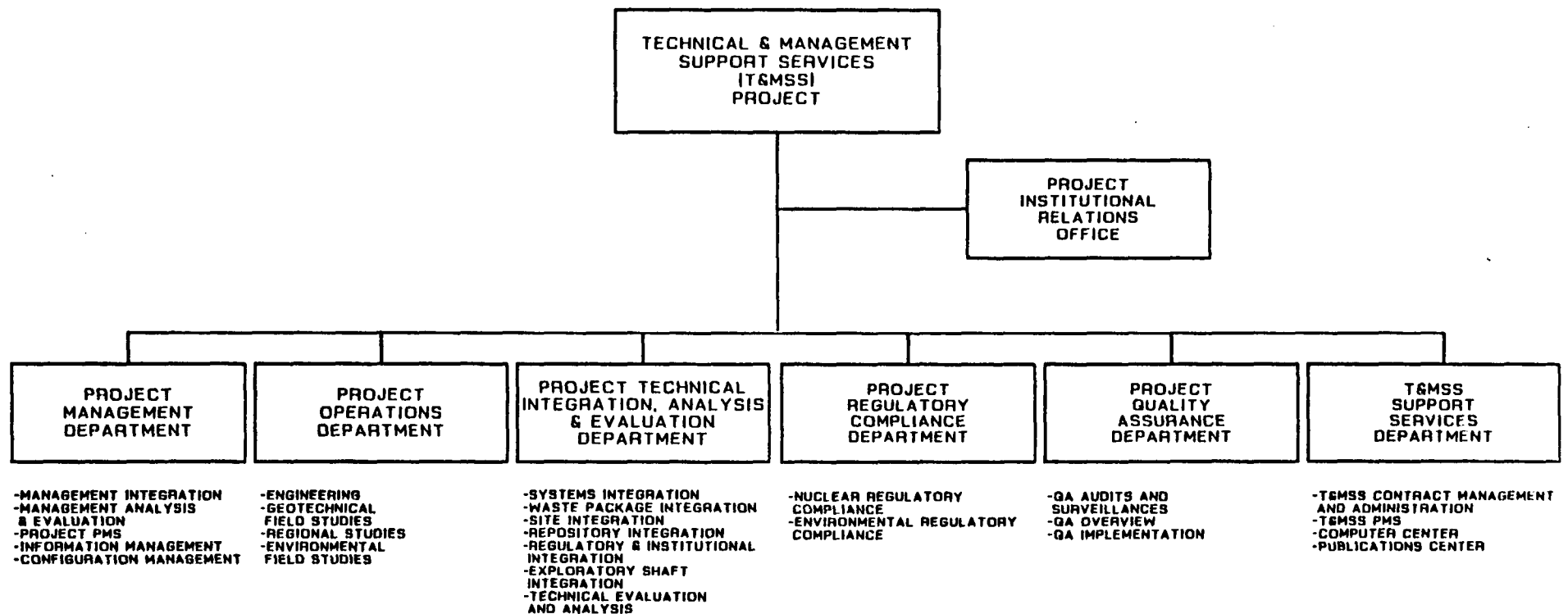
INCLUDES ENVIRONMENTAL, GEOTECHNICAL, REGULATORY, AND ENGINEERING ACTIVITIES

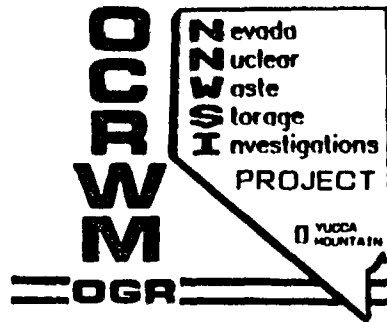
- **T&MSS ORGANIZATION
(SAIC, WESTINGHOUSE, HARZA)**

RESULT OF SYSTEMS ENGINEERING PROCESS, PROJECT INTEGRATION NEEDS, PROJECT MANAGEMENT NEEDS, AND OVERALL CONTRACT SCOPE OF TECHNICAL WORK



T&MSS DEPARTMENTS AND MAJOR FUNCTIONS

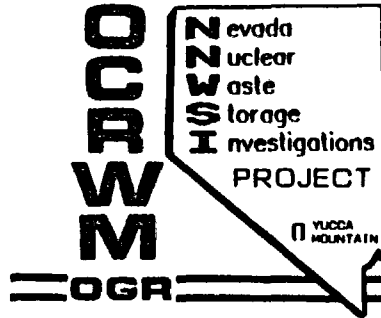




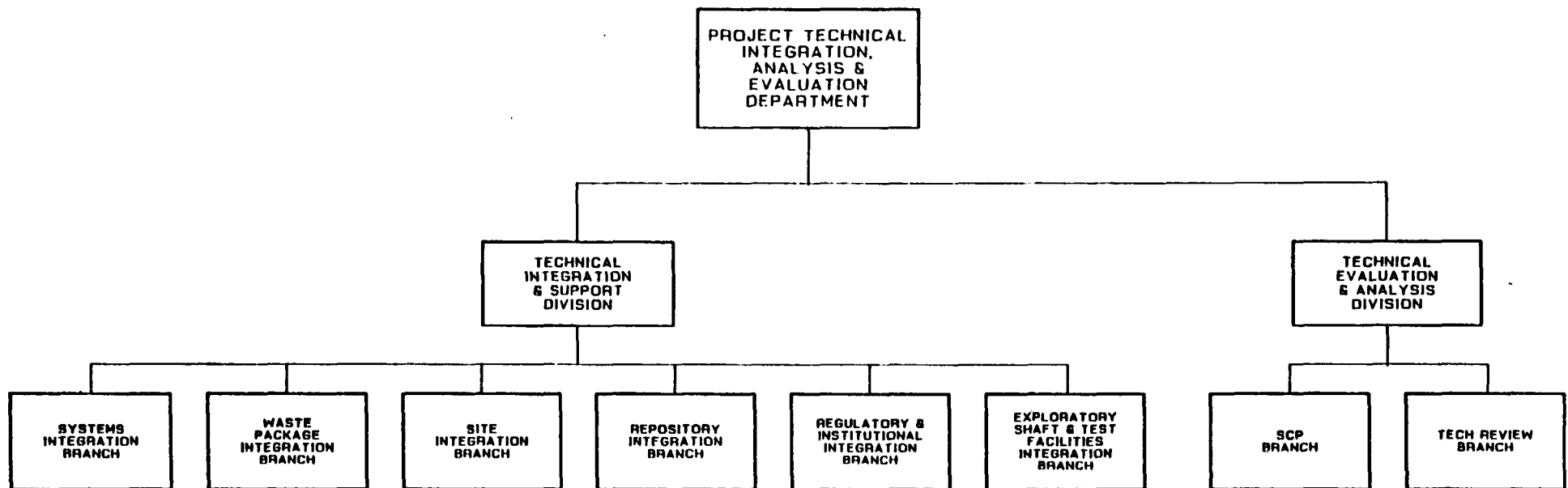
NNWSI PROJECT INTEGRATION

ROLE:

- RESPONSIBLE FOR THE MANAGEMENT AND INTEGRATION ACTIVITIES PERFORMED BY NNWSI PROJECT PARTICIPANTS
- ASSISTANCE TO WMPO IN PLANNING, JUSTIFYING, BUDGETING, SCHEDULING, REVIEWING AND EVALUATING THE ACTIVITIES EXECUTED BY THE NNWSI PARTICIPANTS
- ORGANIZATIONALLY INDEPENDENT
- SENSITIVE TO PARTICIPANTS NEEDS



NNWSI PROJECT INTEGRATION



STUDY PLANS STATUS

- o 106 STUDY PLANS

- EACH LINKED DIRECTLY TO ONE SCP STUDY

- o STUDY PLANS FOR FIVE EXPLORATORY SHAFT STUDIES DUE TO OGR BY 8/7/87

- ONE SUBMITTED 5/1/87

- [SNL EXCAVATION INVESTIGATIONS]

- FOUR IN PREPARATION

- [USGS PERCOLATION STUDIES]

- [USGS OVERCORE STRESS]

- [USGS SHAFT MAPPING]

- [LOS ALAMOS H₂O MOVEMENT - TRACER TESTS (CI.CI⁶)

- o STUDY PLANS FOR 66 ONGOING AND FIRST YEAR STUDIES

- AS MANY AS POSSIBLE DUE TO OGR BY 8/7/87

- APPROXIMATELY ? STUDY PLANS IN PREPARATION FOR 8/7/87 SUBMITTED TO OGR

- PRESENT SCHEDULE (MAY INPUT) 13 BY 8/01, 44 BY 9/01, 52 BY 10/01

TPO MEETING
7/28/87

STUDY PLAN REVIEW PROCEDURE

- o STUDY PLAN PREPARATION AND REVIEW WILL BE QUALITY LEVEL 2 ACTIVITY
 - WMPO WILL DEVELOP ONE QALAS FOR STUDY PLAN PREPARATION AND REVIEW
- o STUDY PLANS ARE PROJECT LEVEL DOCUMENTS WITH WMPO AND OGR APPROVAL
- o INITIAL SCREENING REVIEW
- o PARALLEL OGR/PROJECT REVIEW

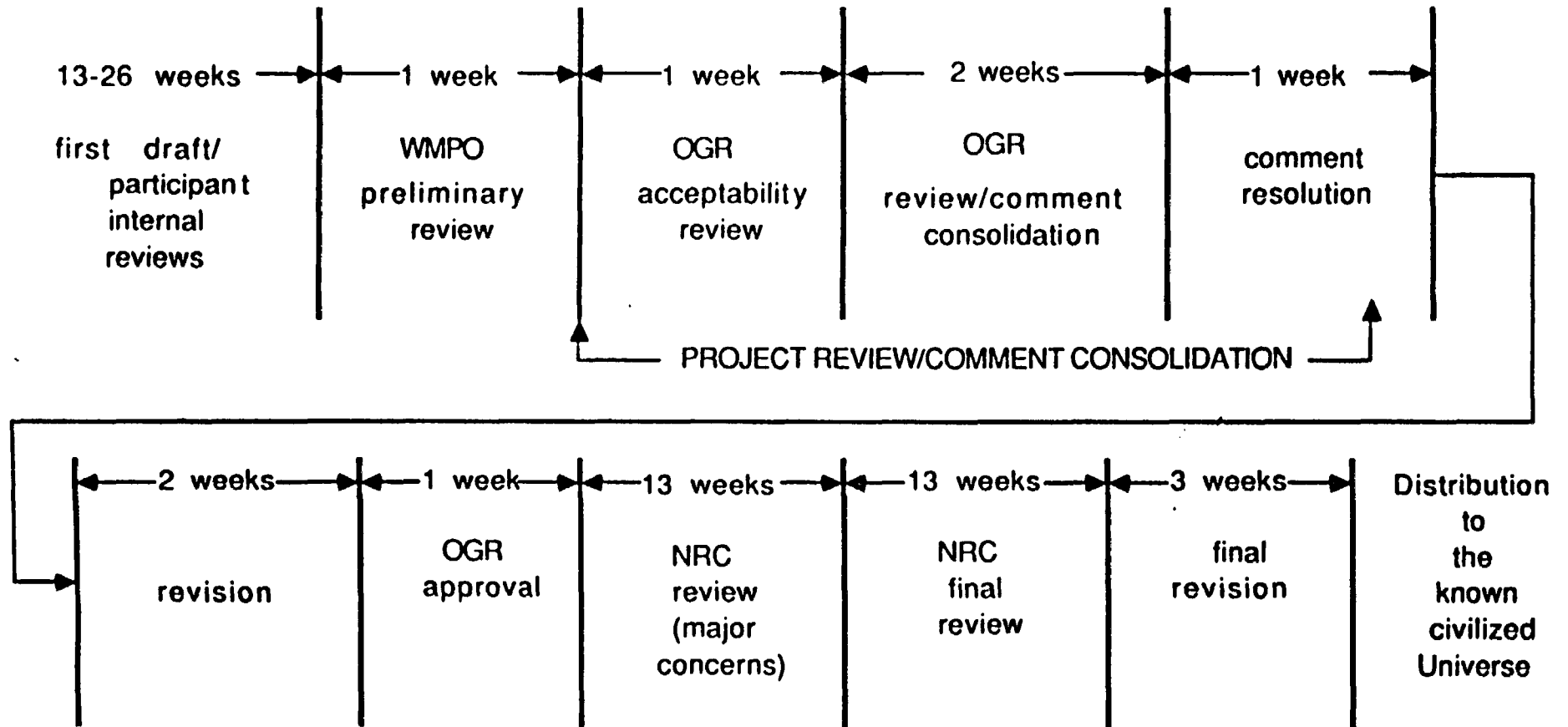
TPO MEETING
7/28/87

CONCERNS WITH STUDY PLAN DEVELOPMENT

- o REASSESS STUDY PLAN SCHEDULE
 - RESOURCE CONFLICTS WITH SCP PREPARATION
- o NEED TO REVISE STUDY PLANS TO BE CONSISTENT WITH REVISED SCP CHAPTER 8
- o OGR REQUIRES MATURE STUDY PLANS FOR THEIR REVIEW
 - LEVEL OF DETAIL

TPO MEETING
7/28/87

STUDY PLAN PREPARATION AND REVIEW



STUDY PLAN STATUS

o RESULTS OF FIRST OGR STUDY PLAN REVIEW AND APPROVAL

- SNL EXCAVATION INVESTIGATION STUDY PLAN SUBMITTED TO OGR FOR REVIEW 5/1/87
- OGR COMMENT CONSOLIDATION MEETING 6/4/87 {222 COMMENTS; APPROXIMATELY 30 SIGNIFICANT TECHNICAL COMMENTS}
- OGR/NNWSI COMMENT RESOLUTION MEETING 6/8/87 - 6/9/87
- REVISED STUDY PLAN SCHEDULED TO BE SUBMITTED TO OGR FOR APPROVAL BY 8/7/87

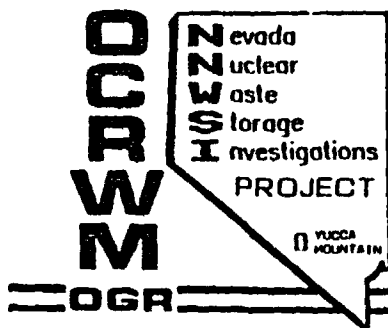
TPO MEETING
7/28/87

CONCERNS WITH STUDY PLAN DEVELOPMENT (CONT.)

o REASSESS OGR REVIEW AND APPROVAL PROCEDURE

- NNWSI PROJECT WILL PROVIDE BACKGROUND MATERIAL FROM CHAPTER 8 TO OGR REVIEWERS TO MINIMIZE INAPPROPRIATE COMMENTS AND TO AVOID TEXT DUPLICATION AND 2ND REVIEW
- OGR TO HOLD COMMENT CONSOLIDATION MEETING TO IDENTIFY INAPPROPRIATE, REDUNDANT, AND EDITORIAL COMMENTS
- EXTEND THE TWO-WEEK PROJECT REVISION CYCLE AS NECESSARY TO ACCOMMODATE PROJECT APPROVAL OF MAJOR REVISIONS
- REASSESS THE TIMING OF INITIATION OF SITE ACTIVITIES
- WILL REQUIRE CASE BY CASE APPEAL FOR EXEMPTION FROM NRC WAITING PERIOD "SCHEDULE"
- WMPO/SAIC WILL PROVIDE STAFF AT EACH COMMENT RESOLUTION MEETING TO DOCUMENT THE COMMENT RESOLUTION RECORD

TPO MEETING
7/28/87



NNWSI PROJECT LICENSING BRIEFINGS

JULY 20 - 24, 1987

WMPO
SAIC
REECo

H&N

F&S

U. S. GEOLOGICAL SURVEY

LOS ALAMOS NATIONAL LABORATORY

SANDIA NATIONAL LABORATORIES

LAWRENCE LIVERMORE NATIONAL LABORATORIES

U.S. DEPARTMENT OF ENERGY

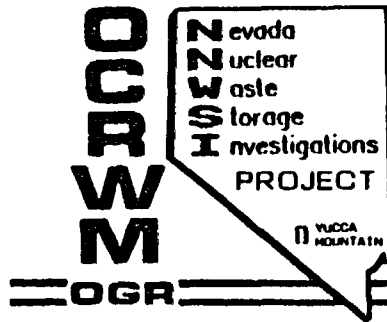
**O
C
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M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

OGR

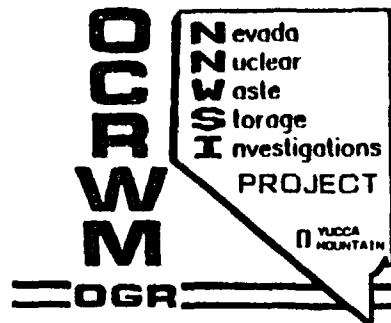
NNWSI PROJECT
LICENSING BRIEFINGS
INTRODUCTION
D. L. VIETH



OBJECTIVES AND PURPOSE OF THE TRAINING

THE OBJECTIVE OF THIS LICENSING BRIEFING IS TO CONTINUE TO REINFORCE THE COMMITMENT OF NNWSI PROJECT PARTICIPANTS TO PREPARING AND DEFENDING THE LICENSE APPLICATION THROUGH:

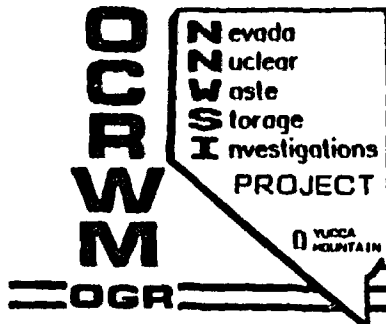
- o UNDERSTANDING THE ADMINISTRATIVE/LEGAL ASPECTS OF THE NRC HEARING PROCESS AND THE APPLICANT'S STATUS IN THAT PROCESS
- o UNDERSTANDING HOW SITE CHARACTERIZATION (PRE-LICENSE APPLICATION) ACTIVITIES WILL AFFECT THE APPLICANT'S CASE
- o UNDERSTANDING THE CRITICAL IMPORTANCE OF "QUALITY ASSURANCE" TO THE PROJECT AND TO THE INDIVIDUAL RESEARCHER
- o BEGINNING TO UNDERSTAND WHAT THE PROJECT MUST BE DOING NOW TO DEVELOP A BASIS FOR DEFENDING THE LICENSE APPLICATION



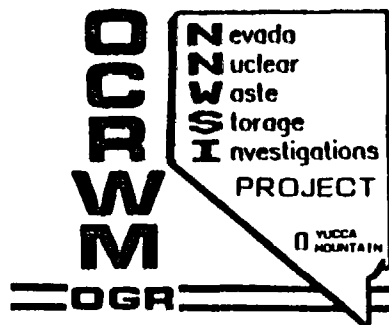
APPROACH

THE APPROACH FOR THIS LICENSING BRIEFING IS TO:

- o PROVIDE A BRIEF REVIEW OF THE REPOSITORY LICENSING PROCESS
 - WHAT IS THE ARENA IN WHICH THE CONTEST WILL OCCUR
- o BRIEFLY REVIEW NRC HEARING PROCEDURES FROM THE ADMINISTRATIVE LAW PERSPECTIVE
 - TECHNICAL vs LEGAL PERSPECTIVES
 - WHAT IS EXPECTED OF THE EXPERT WITNESS
- o EMPHASIZE HOW QUALITY ASSURANCE CAN/WILL AFFECT LICENSING
- o DISCUSS THE CURRENT STATUS OF THE PROJECT RELATIVE TO DEFENDING THE ARGUMENTS FOR ISSUE RESOLUTION PRESENTED IN THE LICENSE APPLICATION

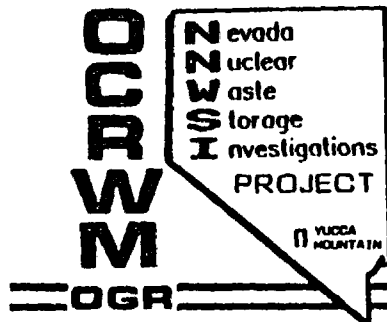
AGENDANNWSI PROJECT LICENSING BRIEFINGS
JULY 20-24, 1987

<u>TIME</u>	<u>SUBJECT</u>	<u>SPEAKER</u>
8:30 A.M.	INTRODUCTION	D. L. VIETH
9:00 A.M.	REVIEW OF THE HIGH LEVEL WASTE REPOSITORY LICENSING PROCESS	M. A. GLORA
9:30 A.M.	NRC'S LICENSE APPLICATION REVIEW AND HEARING PROCEDURES	R. L. GOTCHY
10:00 A.M.	BREAK	
10:15 A.M.	NRC HEARINGS AND YOU {WHAT'S AN EXPERT LIKE YOU DOING IN A PLACE LIKE THIS?	L. BRENNER



AGENDA CONT.

11:15 A.M.	THE ROLE AND IMPACT OF QA IN LICENSING HEARINGS	R. GOTCHY/ L. BRENNER
11:45 A.M.	LUNCH	
12:45 P.M.	BUILDING THE LICENSING CASE	J. SZYMANSKI
1:30 P.M.	SUMMARY AND CLOSING	D. L. VIETH



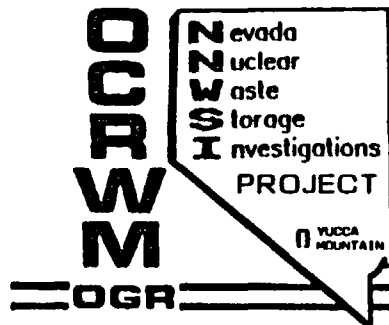
THE MANAGEMENT PERCEPTION

NNWSI PROJECT STAFF HAVE CONTINUED TO MAINTAIN A LEADERSHIP ROLE IN THE OGR PROGRAM AND HAVE DEMONSTRATED AN EXCEPTIONAL LEVEL OF DEDICATION TO DOING AN OUTSTANDING TECHNICAL JOB UNDER DIFFICULT CIRCUMSTANCES.

CONSIDER THE SITUATION:

1. THERE IS NOT YET A FULLY DEVELOPED AWARENESS OF THE FACT THAT SITE CHARACTERIZATION DATA WILL PROVIDE THE BASIS FOR THE LICENSE APPLICATION AND WILL THEREFORE BE SUBJECT TO ATTACK IN A PUBLIC FORUM
2. THE RECOGNITION OF THE CRITICAL IMPORTANCE OF BOTH THE LETTER AND THE SPIRIT OF QA NEEDS IMPROVEMENT
3. COMPLEXITIES INHERENT IN THE PROGRAM RESULTING FROM EXTENDED TIMEFRAMES, STAFF TURNOVER, LACK OF PRECEDENT, AND THE UNIQUE STATUS OF INTERESTED PARTIES WILL RESULT IN A MAJOR LICENSING PROBLEM THAT MUST BE ADDRESSED IMMEDIATELY.

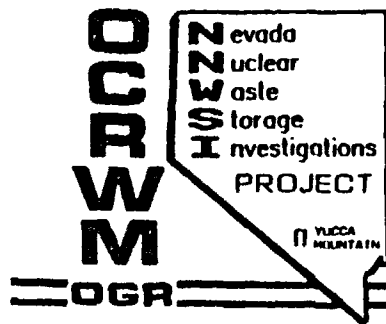
THE RESPONSIBILITY FOR SUCCESS OR FAILURE IS OURS! DOE, WITH HELP FROM PROJECT PARTICIPANTS, MUST DEMONSTRATE COMPLIANCE.



WMPO EXPECTATIONS FOR BRIEFING

- o IMPROVED UNDERSTANDING OF THE RELATIONSHIP OF SITE CHARACTERIZATION ACTIVITIES TO THE NRC LICENSING PROCESS
 - PRE-APPLICATION
 - POST-APPLICATION
 - EFFECTS OF EXTENDED TIME-FRAME
- o IMPROVED UNDERSTANDING OF THE ROLE OF THE STATE AND OTHER INTERESTED PARTIES
- o INCREASED APPRECIATION OF THE IMPORTANCE OF QUALITY ASSURANCE AND DOCUMENTATION
- o IMPROVED UNDERSTANDING OF THE TECHNICAL AND LEGAL CHALLENGES TO WHICH THE PROJECT, AND WE AS INDIVIDUALS WILL BE SUBJECTED
- o RECOGNITION OF, AND COMMITMENT TO, THE STEPS WE SHOULD BE TAKING NOW TO BUILD A DEFENSIBLE LICENSING CASE

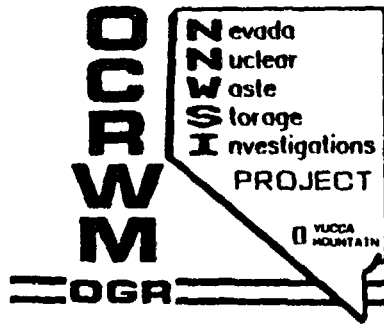
U.S. DEPARTMENT OF ENERGY



REVIEW OF THE
HIGH LEVEL WASTE
REPOSITORY LICENSING PROCESS

M. A. GLORA

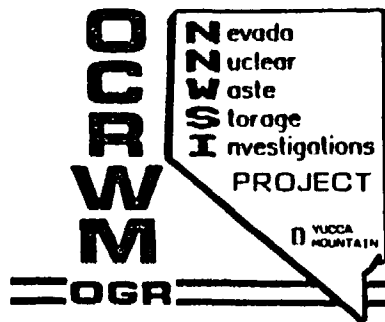
SAIC/T&MSS



THE REPOSITORY LICENSING PROCESS OBJECTIVES

- o BRIEFLY REVIEW THE REPOSITORY LICENSING PROCESS AS DEFINED IN NWPA, 10 CFR 60 (DISPOSAL OF HIGH-LEVEL WASTE) AND 10 CFR 2 (RULES OF PRACTICE FOR DOMESTIC LICENSING PROCEEDINGS)
- o EMPHASIZE TWO PECULIARITIES OF THE REPOSITORY LICENSING PROCESS THAT WILL AFFECT HOW WE MUST DO OUR WORK NOW AND THE DEFENSE OF THE LICENSE APPLICATION
 - THE TIME FRAME, INCLUDING THE SITE CHARACTERIZATION PHASE
 - THE EARLY AND INTIMATE INVOLVEMENT OF OTHER PARTIES TO THE LICENSING PROCEEDING

U.S. DEPARTMENT OF ENERGY



SUMMARY OF
THE REPOSITORY LICENSING PROCESS

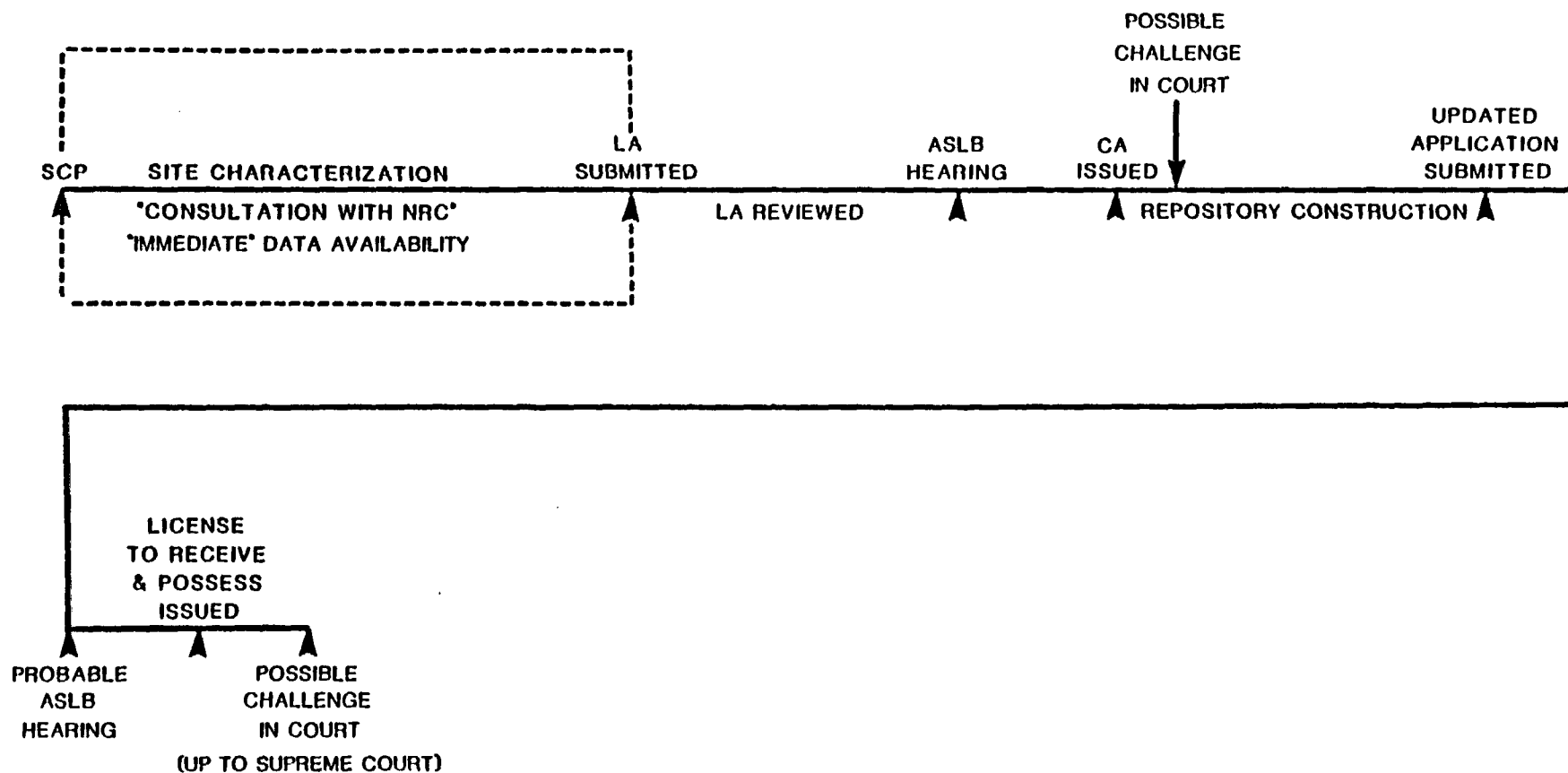
SITE CHARACTERIZATION THROUGH ISSUANCE OF LICENSE

**O
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W
M**

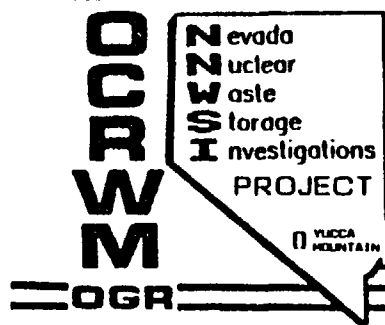
Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

YUCCA MOUNTAIN

SUMMARY OF REPOSITORY LICENSING PROCESS



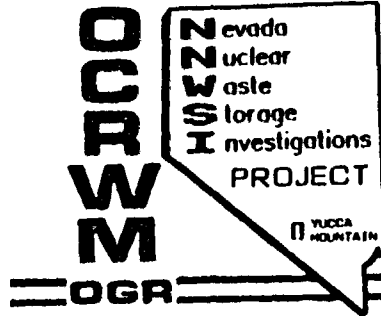
U.S. DEPARTMENT OF ENERGY



PECULIARITIES OF THE REPOSITORY

LICENSING PROCESS

THE EXTENDED TIME FRAME

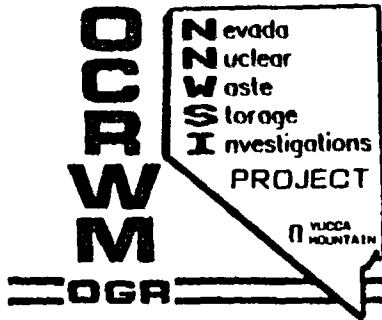


THE SCHEDULE *

DURATIONS

- SITE CHARACTERIZATION: YUCCA MOUNTAIN ES CONSTRUCTION STARTS - LATE 1988
- SITE SELECTION AND APPROVAL AND SUBMITTAL OF THE LICENSE APPLICATION TO NRC - 1995
- INITIAL LICENSING REVIEW COMPLETE (CA ISSUED) - 1998
- ISSUANCE OF LICENSE BY NRC TO RECEIVE AND POSSESS RADIOACTIVE MATERIALS - 2003

* OCRWM MISSION PLAN AMENDMENT, JUNE 1987, PAGE 10

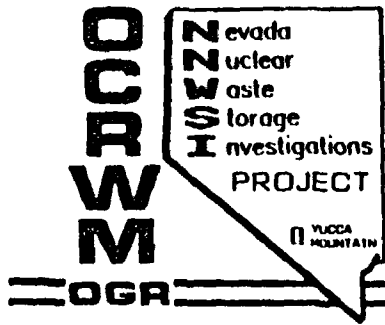


LICENSING CONCERNS RESULTING
FROM THE EXTENDED SCHEDULE

- o THE PREPARATION AND DEFENSE OF THE LICENSE APPLICATION MUST BE BASED ON INFORMATION AND ANALYSES DEVELOPED DURING SITE CHARACTERIZATION
- o THE LENGTHY SITE CHARACTERIZATION PHASE WILL RESULT IN SEVERAL SIDE EFFECTS WHICH WE MUST MITIGATE
 - TURNOVER OF KEY STAFF AND MANAGEMENT WITHIN THE PROJECT, THE PROGRAM, AND AT THE NRC

HOW IS THE "CORPORATE MEMORY" TO BE MAINTAINED?
HOW CAN WE BEST COMPENSATE FOR INTERPRETIVE OR
DIRECTIONAL CHANGES RESULTING FROM STAFF TURNOVER -
MAINTAIN CONTINUITY?

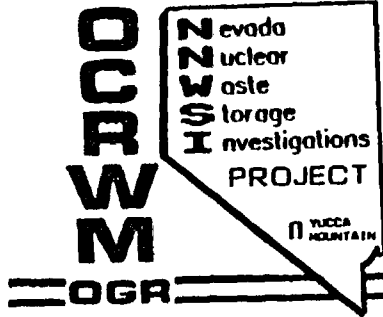
- UNDER NWPA THE NRC HAS AN EXTREMELY SHORT TIME (36 MONTHS) TO MAKE A CA DECISION
 - HOW CAN WE HELP THEM ACCOMPLISH THEIR TASK IN VIEW OF THE MASSIVE AMOUNT OF INFORMATION THAT WILL RESULT FROM SITE CHARACTERIZATION?



MAINTAINING CONTINUITY
COMPENSATING FOR PERSONNEL TURNOVER

THE PROBLEM: UNAVOIDABLE CONSEQUENCES OF STAFF TURNOVER
WILL BE:

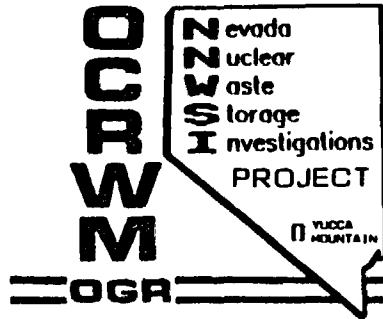
1. DIFFERING, AND SOMETIMES CONFLICTING, UNDERSTANDING OF
THE SITE BASED ON INDIVIDUAL CONCEPTS AND
INTERPRETATIONS
2. DIFFERING INTERPRETATIONS OF REGULATIONS AND GUIDANCE BY
NRC STAFF DUE TO LACK OF EXPERIENCE APPLYING A NATURAL
SYSTEM BASED ON CONCEPT EXTENDING 10,000 YEARS INTO THE
FUTURE
3. CHANGES IN THE PROJECT (DOE AND CONTRACTOR) SITE
CHARACTERIZATION PROGRAM DUE TO
 - REACTION TO INPUT AND COMMENT BY NRC AND OTHERS
 - EVOLUTION OF THE UNDERSTANDING OF SITE AND DESIGN
 - TENDENCY TO RE-DIRECT ON-GOING TECHNICAL
PROGRAMS/STUDIES BY NEWLY ASSIGNED PERSONNEL



ACTIONS THE PROJECT CAN TAKE TO MINIMIZE THE
EFFECTS OF STAFF TURNOVER AND MAINTAIN CONTINUITY

- o ASSURE THAT NEW PROJECT STAFF ARE FULLY AWARE OF PAST ACTIVITIES AND DECISIONS AND THEIR RELATIONSHIP TO EXISTING AND FUTURE PLANS, INCLUDING THE RELATIONSHIP OF THOSE ACTIVITIES TO THE LICENSING ISSUES
- o ASSURE THAT PROJECT LICENSING POSITIONS ARE DISSEMINATED THROUGHOUT THE PROJECT AND ARE NOT DEVIATED FROM WITHOUT GOOD CAUSE AND FULL MANAGEMENT APPROVAL
- o MAINTAIN A CONTINUING PROGRAM TO FAMILIARIZE NEW NRC STAFF WITH THEIR PREDECESSORS POSITIONS AND CONCERNS
- o FULLY DOCUMENT
 - THE BASES FOR PROJECT POSITIONS, ANALYSES, AND THEIR RELATIONSHIP TO REGULATORY REQUIREMENTS AS CURRENTLY UNDERSTOOD
 - THE BASES FOR ANY DEVIATIONS FROM THE ABOVE
 - UNDERSTANDINGS AND AGREEMENTS WITH THE NRC

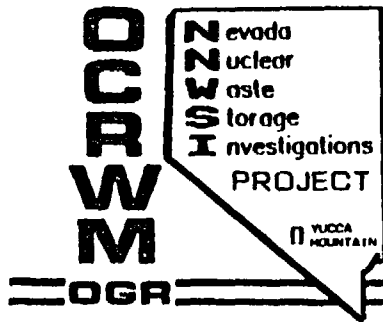
IN SUMMARY, THE BEST DEFENSE AGAINST THE EFFECTS OF NRC AND PROJECT STAFF TURNOVER IS AN EFFECTIVE "EDUCATION" PROGRAM ACCOMPANIED BY AN UNASSAILABLE DOCUMENTATION TRAIL



CONTINUITY DURING SITE CHARACTERIZATION AND ITS
RELATIONSHIP TO HELPING NRC ACCOMPLISH ITS
OBJECTIVE

- o THE ULTIMATE OBJECTIVE OF THE NRC STAFF AND HEARING BOARD IS TO DETERMINE THAT THE PUBLIC RADIOLOGICAL HEALTH AND SAFETY IS ADEQUATELY PROTECTED
- o IN ORDER TO ACCOMPLISH THE ABOVE, THE NRC MUST BE ABLE TO CONVINCE THEMSELVES THAT WHAT WE HAVE DONE DURING SITE CHARACTERIZATION ACCOMPLISHES THE OBJECTIVE - BASED ON THE COMPLETENESS AND QUALITY OF THE DOCUMENTATION WE PROVIDE THEM OVER THE LONG-TERM AND AT THE TIME OF LICENSE APPLICATION

IF THE NRC DOES NOT SUCCEED -
WE DO NOT SUCCEED



WHAT WE CAN DO DURING SITE CHARACTERIZATION
TO HELP THE NRC ACCOMPLISH THEIR OBJECTIVE

- o CONTINUALLY EVALUATE THE COMPREHENSIVENESS AND DOCUMENTATION QUALITY OF STUDIES AND ANALYSES.
 - IS THE INVESTIGATOR CONVINCED OF THE DEFENSIBILITY OF HIS WORK?
 - HAVE REASONABLE ALTERNATIVES/VIEWPOINTS, AND ALL AVAILABLE DATA BEEN CONSIDERED AND DOCUMENTED?
 - IF THE ORIGINAL DATA COLLECTOR/ANALYST IS NOT AVAILABLE, CAN SUPPORT OF HIS DATA AND CONCLUSIONS BE ASSUMED BY OTHERS WITHIN THE PROJECT BASED ON THE WRITTEN RECORD?
 - IS THE QUALITY AND COMPREHENSIVENESS OF THE RECORD SUCH THAT NOT ONLY PRESENT NRC STAFF, BUT ALSO THEIR SUCCESSORS, WILL BE ABLE TO ADOPT AND SUPPORT THE CONCLUSIONS DURING THE ADJUDICATORY HEARINGS.

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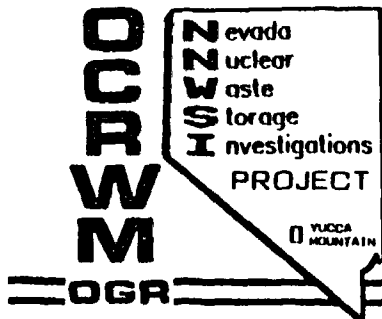
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PECULIARITIES OF THE REPOSITORY
LICENSING PROCESS

UNPRECEDENTED INVOLVEMENT OF
OTHER PARTIES

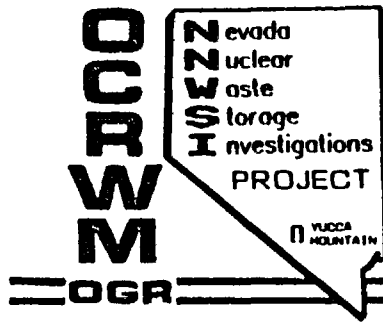


THE REPOSITORY LICENSING PROCESS
UNIQUE STATUS OF INTERESTED PARTIES

THE NWPA (AND THE UPCOMING NRC LSS RULEMAKING) HAVE ESTABLISHED AN UNPRECEDENTED POSITION OF STRENGTH FOR INTERESTED PARTIES (THE STATE) TO CHALLENGE THE US DURING THE LICENSING PROCESS

- o FOR ALL PRACTICAL PURPOSES "DISCOVERY" HAS ALREADY STARTED
- o INTERESTED PARTIES WILL HAVE ACCESS TO APPLICANT DATA AND ANALYSES FAR IN ADVANCE OF THE HEARING
 - DEVELOPMENT OF OPPOSING POSITIONS, BASED ON INTERPRETATIONS OF OUR DATA, WILL PROCEED IN PARALLEL WITH DEVELOPMENT OF OUR OWN POSITIONS
- o INTERESTED PARTIES HAVE THE OPPORTUNITY TO GATHER THEIR OWN DATA TO SUPPORT THEIR CONCLUSIONS AND POSITIONS THROUGHOUT SITE CHARACTERIZATION

IN THE PAST SUCH CHALLENGES HAVE BEEN RELATIVELY AD HOC, LATE IN THE LICENSING PROCESS, AND FREQUENTLY POORLY ORGANIZED AND FUNDED - THIS IS NOT THE CASE FOR THE REPOSITORY!



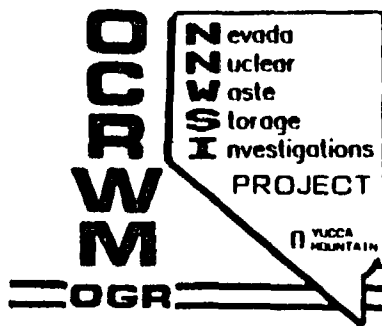
IMPACTS OF INTERESTED PARTIES ON THE OUTCOME
OF THE LICENSING PROCESS

- o THE NRC STAFF WILL BE EXPOSED TO THE OPINIONS AND POSITIONS OF OTHER PARTIES THROUGHOUT SITE CHARACTERIZATION
 - MUST REMAIN IMPARTIAL
 - WILL INFLUENCE THE STAFF'S POSITIONS AND APPROACH
- o OTHER PARTIES' CONTENTIONS AND SUPPORTING EVIDENCE DURING THE HEARING MUST BE THOROUGHLY CONSIDERED BY THE BOARD BASED ON THE EVIDENCE BEFORE THEM
 - TECHNICALLY QUALIFIED
 - WELL ORGANIZED

IN ORDER TO BE SUCCESSFUL WE MUST HAVE THE STRONGEST, BEST DOCUMENTED, CASE

EG

THE "PREPONDERANCE OF EVIDENCE" WILL PREVAIL

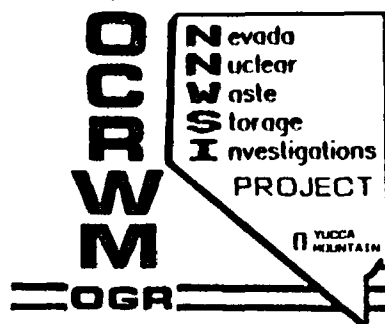


INTERESTED PARTIES
MEETING THE CHALLENGE

- o KNOWN, OR SURMISED, CONCERNS AND PROBABLE POSITIONS OF OTHER PARTIES MUST BE CONSCIOUSLY EVALUATED THROUGHOUT SITE CHARACTERIZATION
- DEVELOP AND DOCUMENT A SUPPORTABLE DEFENSE AS NECESSARY
- o TREAT STATE COMMENTS AND OBSERVATIONS WITH THE SAME DILIGENCE ACCORDED TO THE NRC'S INPUT

LISTEN - EVALUATE - RESPOND

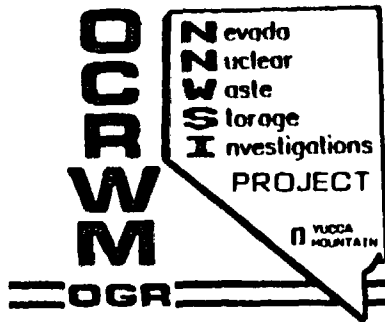
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THE NRC LICENSE APPLICATION
REVIEW AND HEARING PROCEDURES

R. L. GOTCHY

SAIC

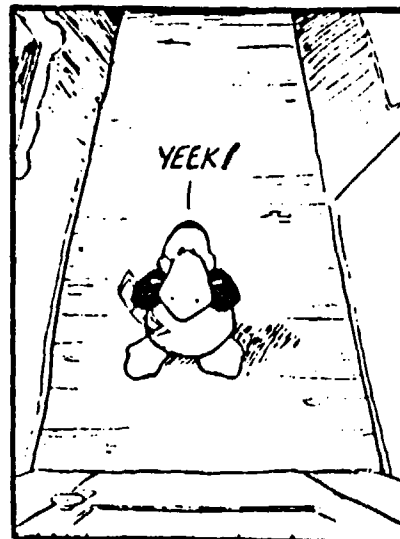
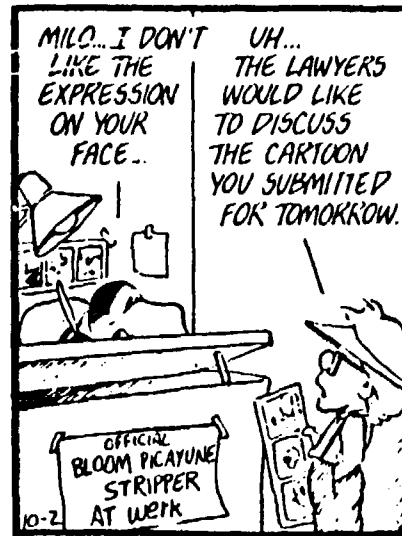


THE NRC LICENSE APPLICATION REVIEW AND HEARING PROCEDURES

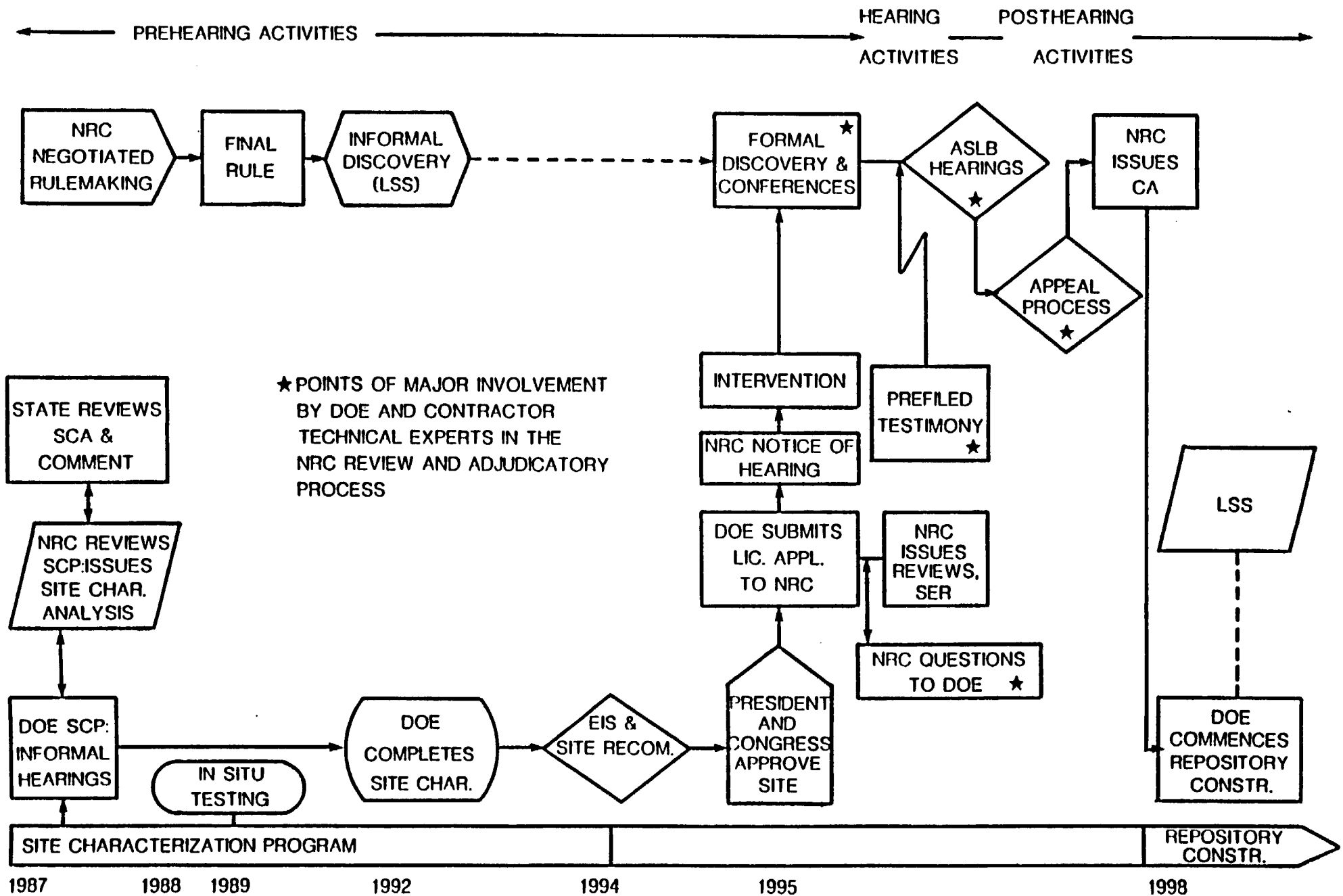
OBJECTIVES

- o UNDERSTAND THE ROLES AND RESPONSIBILITIES OF THE APPLICANT (DOE), THE NRC STAFF AND MANAGEMENT, THE HEARING BOARDS, AND "OTHER PARTIES"
- o UNDERSTAND THAT INFORMATION ON WHICH DECISIONS WILL BE MADE AND ISSUES RESOLVED WILL BE PRESENTED IN THE LICENSE APPLICATION
- o UNDERSTAND HOW DIFFERENCES BETWEEN PARTIES ARE RESOLVED
 1. UNCONTESTED ISSUES (RESOLVED BY DIRECTOR, NMSS WITHOUT LITIGATION)
 2. CONTESTED ISSUES (RESOLVED THROUGH FORMAL NRC HEARING PROCESS)
- o UNDERSTAND THE IMPORTANCE OF QUALITY ASSURANCE (QA) IN RESOLVING CONTESTED AND UNCONTESTED ISSUES, AND PROVIDING FIRM SUPPORT FOR NRC DECISIONS ON ALL ISSUES

Bloom County by Berke Breathed

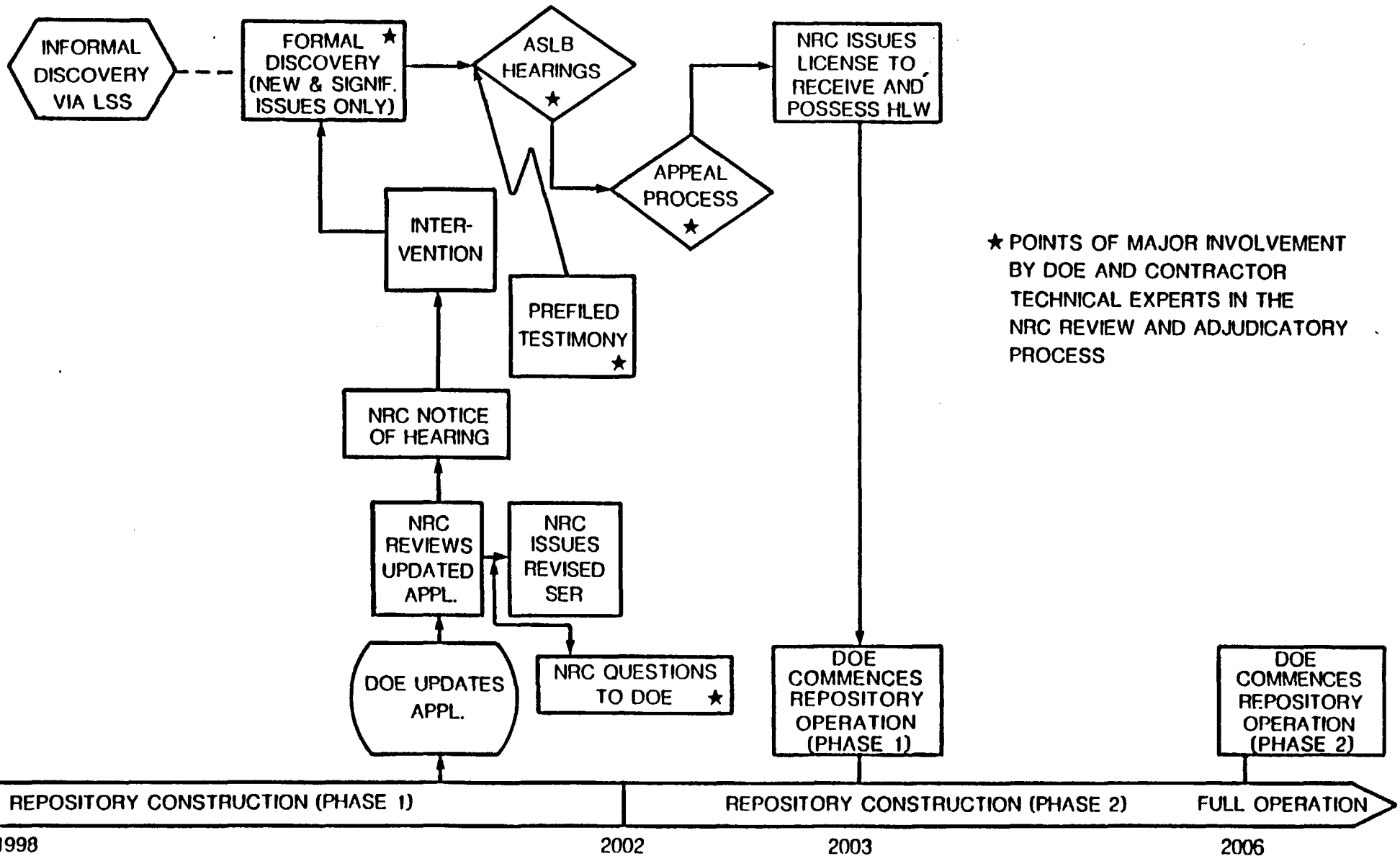


ANTICIPATED PART 60 LICENSING PROCESS THROUGH CONSTRUCTION AUTHORIZATION

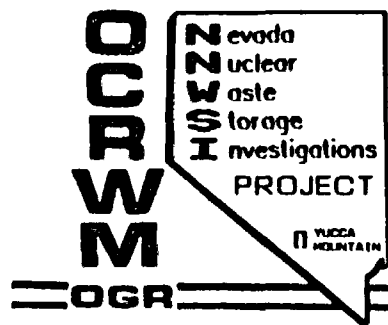


ANTICIPATED PART 60 LICENSING PROCESS AFTER CONSTRUCTION AUTHORIZATION

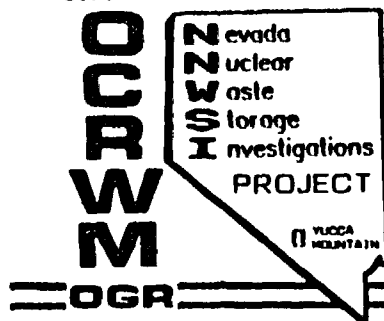
PREHEARING ACTIVITIES | HEARINGS | POSTHEARING ACTIVITIES →



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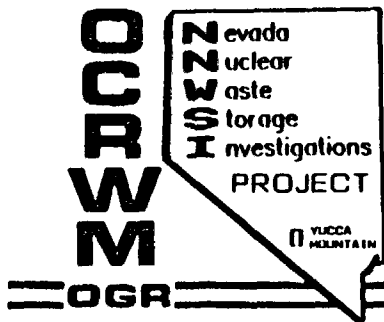


THE RESPONSIBILITIES OF DOE AND DOE CONTRACTORS
UNDER THE PROCESS SET BY THE NRC LICENSING PROCEDURES



DOE's RESPONSIBILITIES TO BUILD
AND DEFEND THE LICENSING CASE

- o DEVELOP THE SCIENTIFIC ARGUMENTS THAT EXPLAIN ON AN ISSUE BY ISSUE BASIS HOW AND WHY THE SITE AND DESIGN SATISFY THE REGULATORY CRITERIA
 - SUPPORT INFORMAL RESOLUTION OF TECHNICAL ISSUES BEFORE THE LA IS FILED
- o PRESENT THE DOE's CASE IN THE LICENSE APPLICATION
- o SUPPORT THE DISCUSSIONS REQUIRED TO RESOLVE ALL CONTESTED AND UNCONTESTED POINTS FOR WHICH NRC OR ASLB MUST MAKE A DECISION
 - DEMONSTRATE THE CORRECTNESS OF DOE'S LICENSING CASE TO THE NRC DURING STAFF REVIEW OF THE LICENSE APPLICATION
 - DEFEND DOE's CASE DURING CONTENTIOUS PUBLIC HEARINGS ON ALL CONTESTED ISSUES
 - DEFEND DOE's CASE DURING APPEALS BEFORE NRC AND FEDERAL COURTS

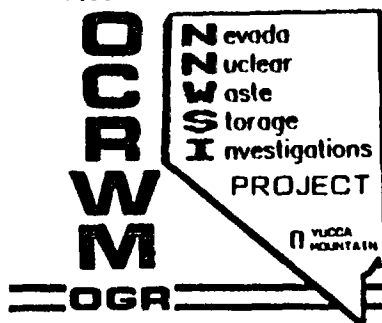


FUNDAMENTAL FACTORS IN BUILDING AND
DEFENDING THE LICENSING CASE

IN ORDER FOR DOE AND ITS CONTRACTORS TO ACHIEVE SUCCESS
UNDER THE LICENSING PROCEDURES ESTABLISHED BY NRC, WE MUST:

- o RECOGNIZE AND CONSIDER OTHER REASONABLE INTERPRETATIONS
OF DATA OR TECHNICAL POSITIONS
- o BE PREPARED TO ASSUME "OWNERSHIP" OF THE DOE'S DATA AND
TECHNICAL POSITIONS, AND DEMONSTRATE COMPLIANCE WITH
THE REGULATIONS
- o BE PREPARED TO NEGOTIATE ON A REASONABLE BASIS WITH THE
NRC STAFF
- o MAINTAIN A DOCUMENTATION AND QA PROGRAM UPON WHICH THE
NRC STAFF, BOARD'S AND FEDERAL COURTS CAN RELY TO MAKE
DECISIONS

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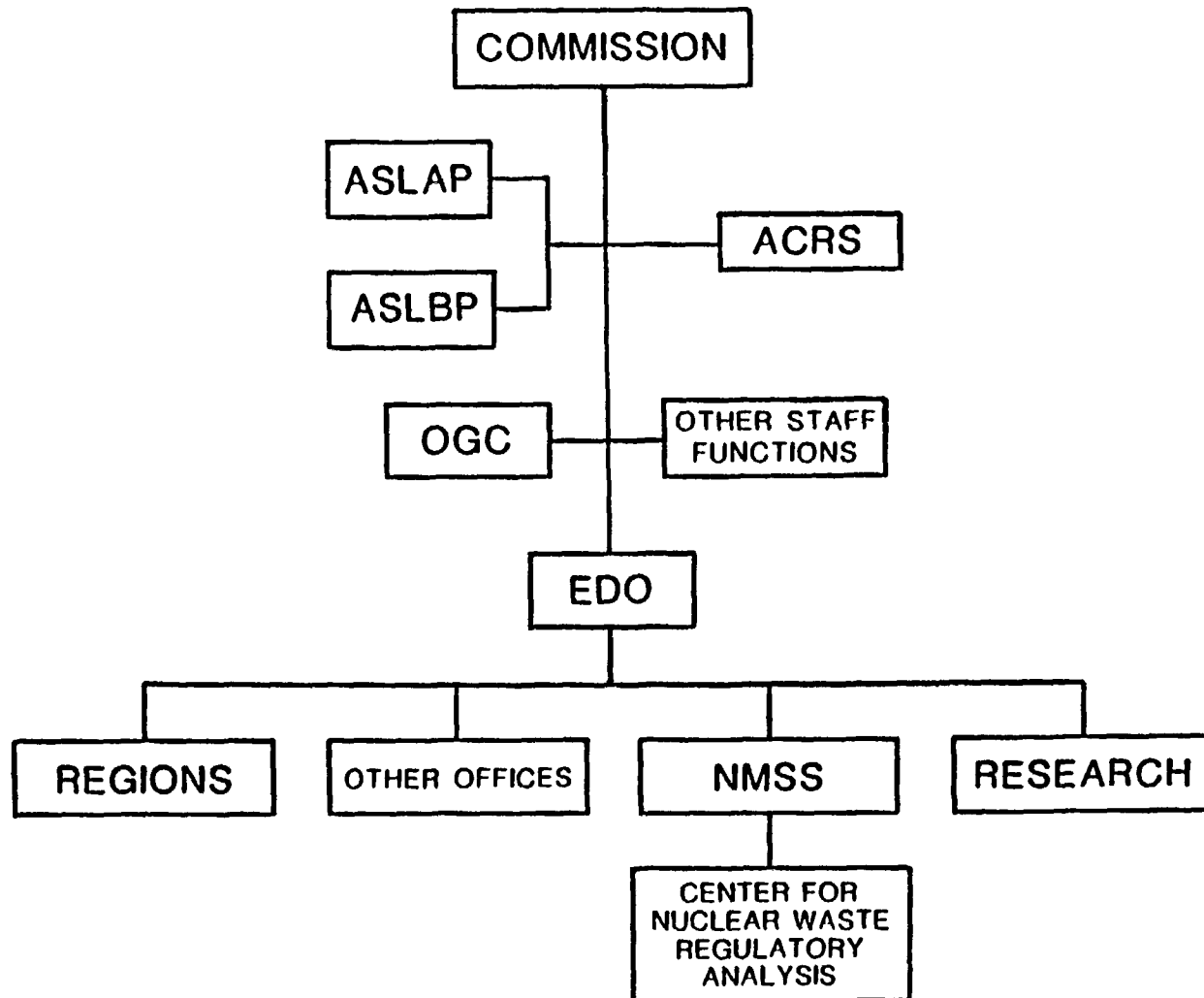


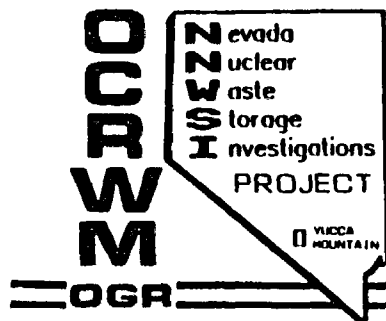
THE RESPONSIBILITIES OF THE NRC

UNDER THE PROCESS SET BY THE NRC LICENSING PROCEDURES

NUCLEAR REGULATORY COMMISSION

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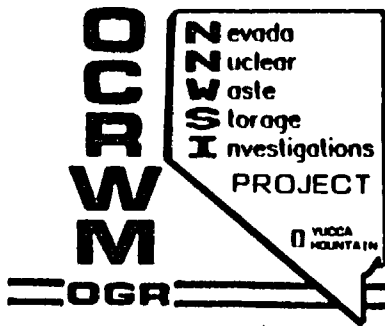




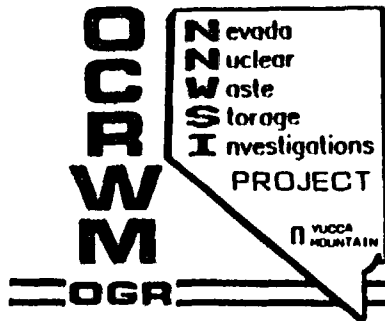
LICENSE APPLICATION REVIEW AND HEARING PROCEDURES MAJOR RESPONSIBILITIES OF NRC STAFF

- o REVIEW SITE CHARACTERIZATION PLAN AND LICENSE APPLICATION (INCLUDING SAR AND EIS)
- o PREPARE SITE CHARACTERIZATION ANALYSIS, SAFETY EVALUATION REPORT (SER), AND ENVIRONMENTAL IMPACT REVIEW
- o PRECEEDING AND AFTER FILING LICENSE APPLICATION, OBTAIN RESOLUTION OF ALL TECHNICAL ISSUES (CONTESTED AND UNCONTESTED) TO ASSURE THAT PUBLIC HEALTH AND SAFETY WILL BE PROTECTED IF A LICENSE IS GRANTED
 - OBTAIN CLARIFICATION/RESOLUTION AS NECESSARY THROUGH A FORMAL QUESTION AND ANSWER PROCESS WITH THE DOE
- o PRESENT THE NRC STAFF'S DEFENSE OF THE ACCEPTABILITY OF THE DOE'S DEMONSTRATION OF COMPLIANCE BEFORE THE LICENSING BOARD, THE APPEAL BOARD AND IN FEDERAL COURTS IF NECESSARY
- o BASED ON THE RESULT OF THE REVIEW AND ADJUDICTORY PROCESS, PREPARE AND ISSUE THE CONSTRUCTION AUTHORIZATION AND LICENSE TO RECEIVE AND POSSESS HLW

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ROLES OF THE AFFECTED STATES, INDIAN TRIBES AND
INTERVENORS UNDER THE NRC REVIEW AND HEARING PROCESS



ROLES OF THE AFFECTED STATES AND INDIAN TRIBES
UNDER THE NRC REVIEW AND HEARING PROCEDURES

NOTE: AFFECTED STATES AND TRIBES ARE AUTOMATICALLY GRANTED PARTY STATUS IN LICENSING PROCEEDINGS [10 CFR 60.62 - 60.65].

- o REVIEW SCP, TECHNICAL ANALYSES, LICENSE APPLICATIONS AND AMENDMENTS, EIS, SAR, SER, ETC; PARTICIPATE IN NEGOTIATED RULEMAKING, DISCOVERY, HEARINGS, APPEALS, ETC.
- o MAY SUPPORT AN APPLICATION, REMAIN NEUTRAL, OR CHALLENGE DOE APPLICATIONS AS AN INTERVENOR; ISSUE BY ISSUE
- o MAY PROVIDE EXPERT WITNESSES TO HEARINGS AND PRESENT DIRECT TESTIMONY, EXHIBITS, ETC.
- o MAY CROSS-EXAMINE EXPERT WITNESSES
- o PREPARE PROPOSED FINDINGS
- o MAY PARTICIPATE IN APPEALS

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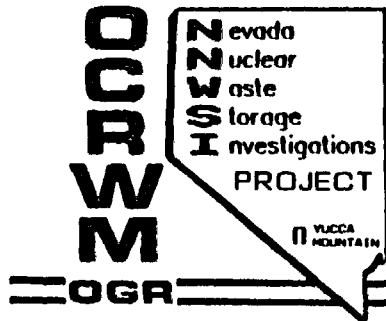
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ROLE OF INTERVENORS UNDER THE NRC REVIEW AND HEARING PROCEDURES

NOTE: MUST ESTABLISH RIGHT TO INTERVENE BY DEMONSTRATING "LEGAL INTEREST" IN THE PROCEEDING, AND PRESENTING AT LEAST ONE CONTENTION DETERMINED TO BE ACCEPTABLE BY THE LICENSING BOARD [10 CFR 2.719].

- o MAY PROVIDE EXPERT WITNESSES AND CHALLENGE DOE AND NRC WITNESSES THROUGH CROSS-EXAMINATION, ETC.
- o MUST PREPARE AND SUBMIT PROPOSED FINDINGS OF FACT TO LICENSING BOARD
- o MAY APPEAL ONLY THOSE ISSUES THEY RAISED

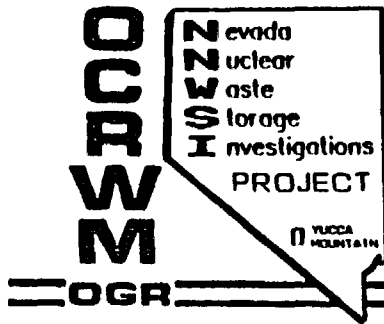


NRC LICENSE APPLICATION REVIEW AND
HEARING PROCEDURES
KEY POINTS TO KEEP IN MIND

- o THE NRC REVIEW AND HEARING PROCEDURES HAVE BEEN DESIGNED TO DECIDE ISSUES THROUGH A FULL AND OPEN DISCUSSION, RESOLVING AS MANY ISSUES AS POSSIBLE WITHOUT LITIGATION [UNCONTESTED], AND THE BALANCE BY ADJUDICATION [CONTESTED]
- o THE NRC STAFF [TECHNICAL AND MANAGEMENT] MUST BE CONVINCED THAT THE REPOSITORY WILL ADEQUATELY PROTECT THE PUBLIC HEALTH AND SAFETY BEFORE THE HEARINGS BEGIN
- o OTHER PARTIES WILL BE GIVEN EVERY REASONABLE OPPORTUNITY TO DISCREDIT OUR WORK, AND PRESENT OPPOSING VIEWS AND EVIDENCE

THE RESPONSIBILITY FOR PROVING OUR LICENSING CASE IS OURS!

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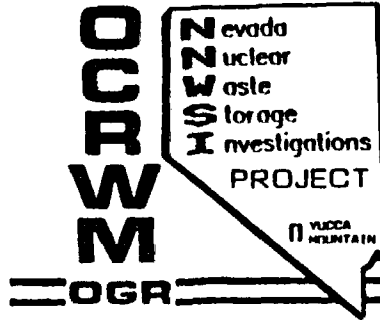
NRC HEARINGS AND YOU

[WHAT'S AN EXPERT LIKE YOU DOING IN A PLACE LIKE THIS?]

L. BRENNER

CONSULTANT

ADMINISTRATIVE LAW JUDGE



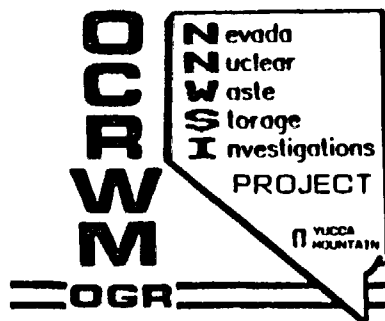
NRC HEARINGS AND YOU

WE DO NOT YET KNOW WHO MAY BE CALLED ON TO PROVIDE THE
SUPPORTING BASIS FOR THE LICENSE APPLICATION

- IT MAY BE ANY ONE OF YOU IN THIS ROOM!
- IT MAY BE SOMEONE WHO IS NOT YET PART OF THE PROJECT!

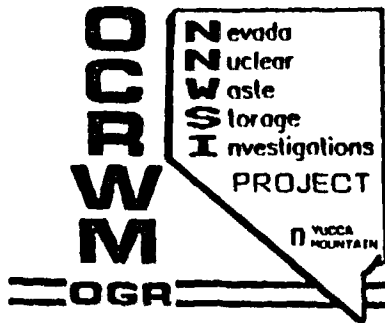
WHY WORRY ABOUT THE HEARINGS NOW?

- BECAUSE YOU ARE NOW LAYING THE FOUNDATION TO PROVIDE
THE SUPPORTING BASIS FOR THE LICENSE APPLICATION



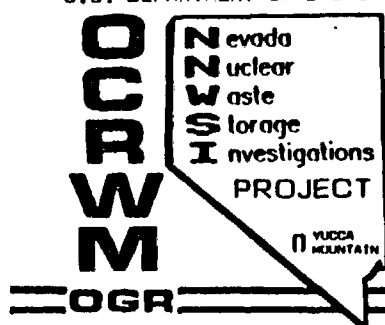
KEY POINTS YOU SHOULD THINK ABOUT NOW AS YOU
PREPARE FOR SITE CHARACTERIZATION

- o PREPARATION NOW IS CRUCIAL IN ORDER TO HAVE:
 - CONTINUITY OF YOUR WORK
 - CREDIBILITY OF YOUR WORK
 - VERIFIABILITY OF YOUR WORK
- o THESE REQUIREMENTS MUST BE MET SO THAT YOUR EXPERT CONCLUSIONS ARE DEMONSTRABLY AND LOGICALLY SUPPORTED EVEN WHEN PRESENTED TO A NON-EXPERT



THINGS TO THINK ABOUT

- o WILL YOU OBTAIN PEER REVIEW OF YOUR WORK AT CRITICAL JUNCTURES?
- o WILL YOUR WORK VERIFIABLY ILLUSTRATE:
 - THAT YOU KEPT AN OPEN MIND;
 - THAT YOU WERE ALERT FOR DIFFERING POSSIBLE CONCLUSIONS AT CRITICAL JUNCTURES;
 - THAT YOU REASONABLY INVESTIGATED SUCH OTHER POSSIBILITIES BEFORE REACHING YOUR CONCLUSION?



THINGS TO THINK ABOUT (CONT)

- HOW WILL YOU EXPLAIN YOUR WORK, ESPECIALLY THE LOGICAL STEPS WHICH SUPPORT YOUR CONCLUSION, TO SOMEONE WHO IS NOT AN EXPERT IN YOUR FIELD?
- HOW WILL YOU ASSURE THAT THE SUPPORT FIELD DATA, LITERATURE SOURCES, SCIENTIFIC PRINCIPLES, AND WHATEVER ELSE YOU BASE YOUR ANALYSIS ON, WILL ALWAYS BE AVAILABLE FOR SOMEONE ELSE TO CHECK, ESPECIALLY ON AN EXTENDED PROJECT AS PEOPLE COME AND GO:
- HOW WILL YOU EXPLAIN TO A NON-EXPERT WHY YOU DID NOT NEED TO PERFORM FURTHER ANALYSES, OR GATHER FURTHER DATA, TO REACH YOUR CONCLUSIONS?

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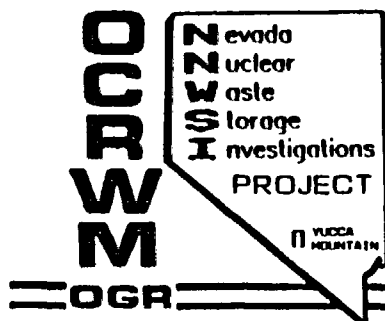
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DEFINITION OF AN EXPERT

AN EXPERT IS SOMEONE WHO KNOWS A LOT ABOUT LITTLE

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DEFINITION OF A LAWYER

A LAWYER IS SOMEONE WHO KNOWS LITTLE ABOUT LOTS OF THINGS

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DEFINITION OF AN EXPERT

AN EXPERT IS SOMEONE GIVING TESTIMONY MORE THAN 100 MILES
FROM HOME, AND GETTING PAID TO DO IT

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DEFINITION OF AN EXPERT WITNESS

AN EXPERT WITNESS IS SOMEONE DEMONSTRABLY QUALIFIED BY
EDUCATION OR EXPERIENCE:

- TO HAVE SPECIAL KNOWLEDGE ABOUT FACTS;
- TO REACH JUDGMENTS BASED ON THOSE FACTS

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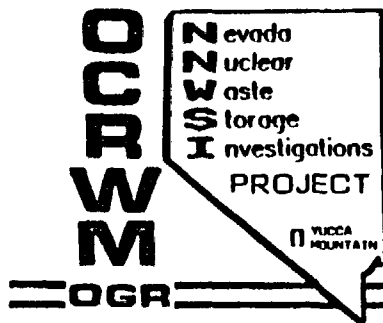
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ROLE OF EXPERT WITNESSES FOR DOE

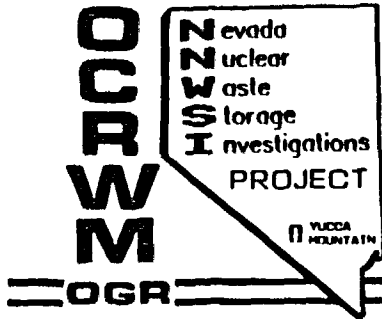
MEMBER OF A TEAM OF PEOPLE WHO WILL PRESENT TESTIMONY TO SUPPORT A FINDING ON THE ULTIMATE HEARING ISSUE OF WHETHER THERE IS "REASONABLE ASSURANCE" THAT THE SITE AND FACILITY DESIGN, FOR A REPOSITORY WILL SAFELY ISOLATE RADIOACTIVE WASTE.



ROLE OF EXPERT WITNESSES - PREHEARING

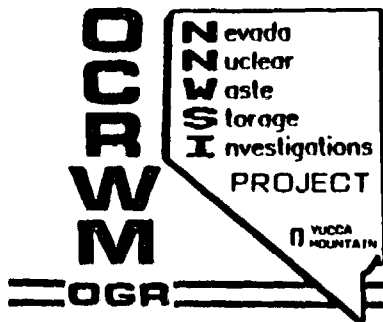
- o ASSIST ATTORNEYS IN ISSUE [CONTENTION] IDENTIFICATION [SCOPING]
- o ASSIST ATTORNEYS WITH DISCOVERY [Eg: INTERROGATORIES, NEGOTIATED RULE MAKING, DEPOSITIONS]
- o ASSIST ATTORNEYS TO PREPARE MOTIONS FOR SUMMARY DISPOSITION [Eg: AFFIDAVITS]
- o ASSIST ATTORNEYS AT PREHEARING CONFERENCES WITH LICENSING BOARD AND OTHER PARTIES
- o PARTICIPATE IN INFORMAL MEETINGS AND NEGOTIATIONS AMONG PARTIES
- o PREPARE PREFILED WRITTEN TESTIMONY

REMEMBER: YOUR WORK NOW WILL SIGNIFICANTLY AND PERMANENTLY AFFECT, YEARS FROM NOW, THE SHAPE AND FOCUS OF THE LICENSING HEARINGS



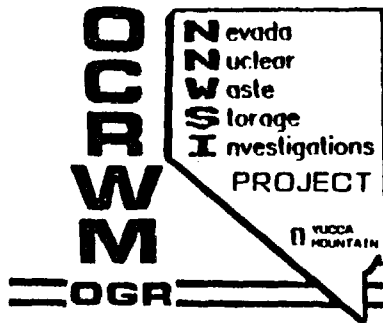
ROLE OF EXPERT WITNESSES - DURING THE HEARINGS

- o PRESENT PREFILED WRITTEN TESTIMONY (DIRECT TESTIMONY; CAN BE IN QUESTION AND ANSWER FORMAT)
- o VOIR DIRE (QUESTIONS OF EXPERTS REGARDING THEIR QUALIFICATIONS)
- o CROSS-EXAMINATION (QUESTIONS BY LAWYERS FOR OTHER PARTICIPANTS)
- o REDIRECT EXAMINATION (QUESTIONS BY YOUR OWN LAWYER)
- o RECROSS - EXAMINATION
- o BOARD EXAMINATION
- o REBUTTAL TESTIMONY (BY YOU OR EXPERTS WHO DISAGREE WITH YOU)



ROLE OF EXPERT WITNESSES - POST-HEARING

- o HELP ATTORNEYS CORRECT SERIOUS ERRORS IN RECORD AND HELP PREPARE PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW
- o HELP ATTORNEYS PREPARE RESPONSES TO MOTIONS TO REOPEN, STAY MOTIONS, APPEAL BRIEFS (APPEAL BOARD, COMMISSION)
- o HELP ATTORNEYS PREPARE BRIEFS FOR APPEALS IN FEDERAL COURTS (U.S. COURTS OF APPEALS, U.S. SUPREME COURT)



PROBABLE ORDER OF PRESENTATION OF TESTIMONY AT
HEARING ("ISSUE BY ISSUE TRIAL")

1. THE APPLICANT [DOE]
2. INTERVENORS
3. STATES AND TRIBES
4. NRC STAFF

NOTE: THE ORDER IS FOR EACH ISSUE BEING LITIGATED, AND MAY ALSO DEPEND ON THE SUBSTANTIVE POSITION OF THE PARTY ON THE PARTICULAR ISSUE. THE ONLY SURE THING IS THAT THE APPLICANT [DOE] WILL TESTIFY FIRST. DOE HAS "BURDEN OF PROOF"

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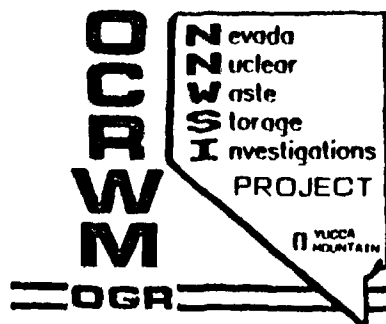
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THE FOUR PARTS OF WRITTEN DIRECT TESTIMONY

1. PROFESSIONAL QUALIFICATION
2. DATA ON WHICH TESTIMONY RELIES
3. INTERPRETATION OF THE DATA
4. EXPERT OPINION [CONCLUSION]

WORTHLESS [WEIGHTLESS!] WITHOUT SATISFYING THE FIRST THREE PARTS.

ITEMS 1, 2 AND 3 ARE DEVELOPED YEARS IN ADVANCE OF THE HEARINGS, INCLUDING WORK YOU ARE DOING NOW.

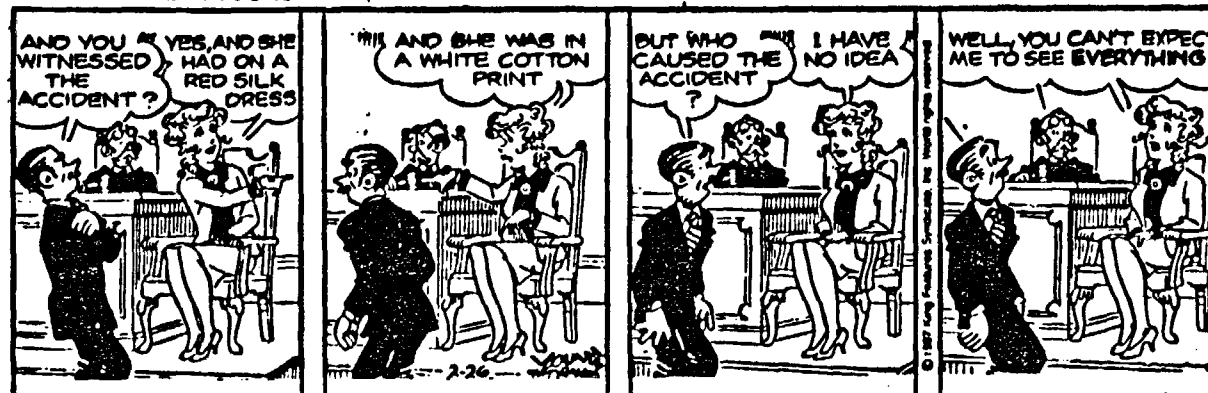


EVIDENCE

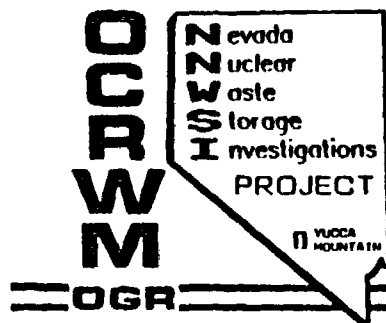
- o FIRST HAND
- o REPORTED BY OTHERS ["HEARSAY"] - TEAM EFFORT
- o WEIGHT OF EVIDENCE (DEPENDS ON SUPPORTING BASES, EXPERTISE, CREDIBILITY, INTERNAL LOGIC & CONSISTENCY, VERIFICATION, CORROBORATION BY OTHER EXPERTS)

10 CFR SECTION 2.743(c): "ONLY RELEVANT, MATERIAL, AND RELIABLE EVIDENCE WHICH IS NOT UNDULY REPETITIOUS WILL BE ADMITTED."

BLONDIE DEAN YOUNG



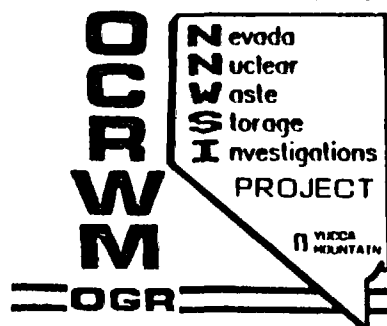
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CONDITION AFFECTING CONDUCT OF EXPERT WITNESSES
THE EX PARTE RULE

WHAT IS ITS INTENT: TO PREVENT THE REALITY OR THE PERCEPTION THAT THE APPLICANT, OR OTHER PARTIES, IS INFLUENCING THE HEARING BOARD OUTSIDE OF THE FORMAL PROCESS

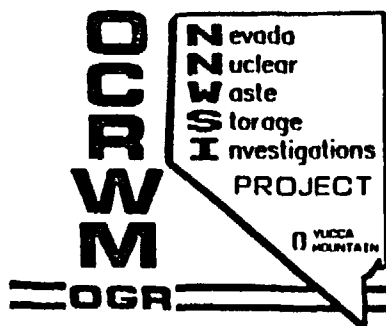
- o PREFERABLY, DO NOT TALK PRIVATELY WITH THE LICENSING BOARD, APPEAL BOARD, COMMISSIONERS, OR THEIR PERSONAL STAFFS ABOUT ANYTHING SUBSTANTIVE FROM NOW ON.
- o FOR SURE, AFTER A HEARING HAS BEEN "NOTICED," [FORMAL ACCEPTANCE FOR REVIEW BY NRC OF THE LICENSE APPLICATION], DO NOT TALK WITH THEM ABOUT ANYTHING WHICH ARGUABLY COULD BE RELATED TO YOUR WORK OR ANYONE ELSE'S WORK IN THE NNWSI PROJECT.
- o IT IS OK TO TALK WITH THE NRC STAFF ABOUT YOUR WORK, AS DISTINGUISHED FROM THE PERSONAL STAFF ADVISING BOARD MEMBERS OR COMMISSIONERS.



SANCTIONS

- o PERJURY [CRIMINAL ACTION FOR LYING] [SEE, FOR EXAMPLE, 10 CFR 50.110]
- o MATERIAL FALSE STATEMENT. ACTION BY NRC. POSSIBILITY OF FINE, AND EVEN REJECTION OF APPLICATION.
- o DISMISSAL OF PARTY BY BOARD FOR DISCOVERY FAILURES, OR OTHER FAILURES TO COMPLY WITH BOARD ORDERS. [10 CFR 2.107].
- o DISMISSAL OF REPRESENTATIVE OF PARTY FOR FAILURE TO COMPLY WITH BOARD ORDERS. [10 CFR 2.713(c)]
- o REJECTION OF ALL OR PART OF PROFERRED TESTIMONY FOR LACK OF PROFESSIONAL QUALIFICATIONS OR RELEVANCE TO ADMITTED CONTENTION. [10 CFR 2.743]

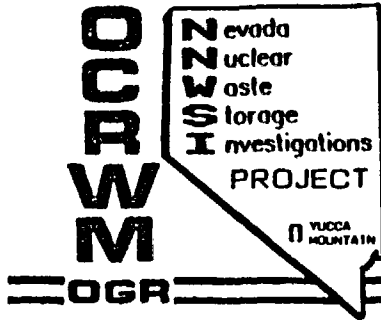
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ROLE AND IMPACT OF QUALITY ASSURANCE
IN LICENSING HEARINGS
- CASE STUDIES -

R. GOTCHY

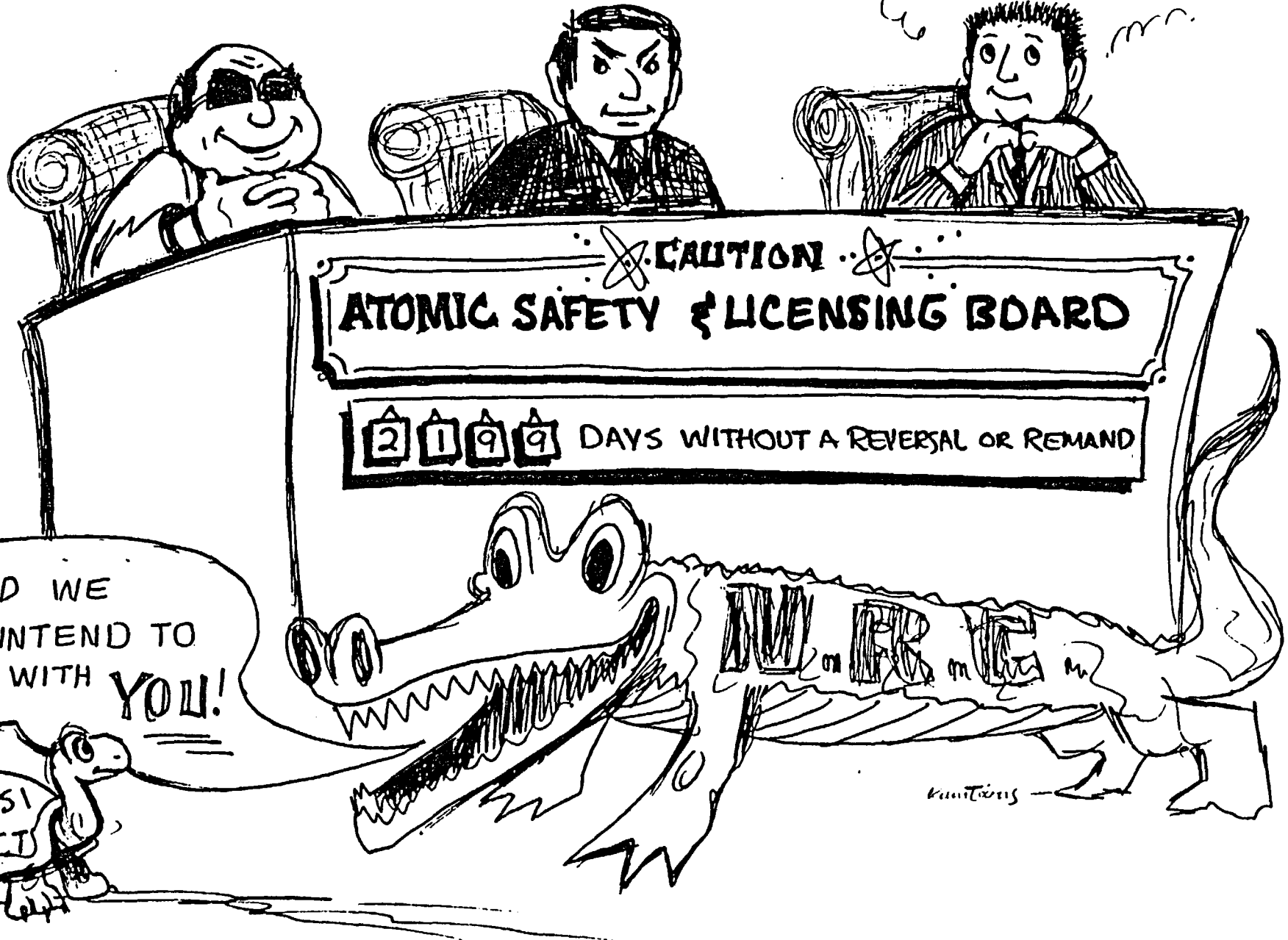
L. BRENNER

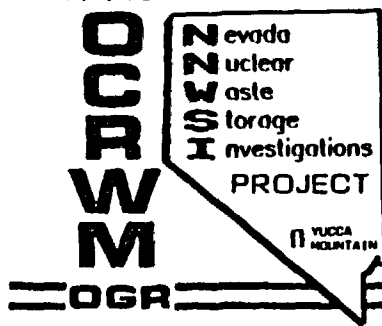


OBJECTIVES OF REVIEWING PAST NRC EXPERIENCE
WITH QUALITY ASSURANCE PROGRAMS

- o GAIN AN UNDERSTANDING OF THE TYPES OF QA PROBLEMS NRC HAS DEALT WITH, AND HOW THEY WERE RESOLVED
- o DETERMINE WHAT "LESSONS LEARNED" FROM PAST FAILURE OF OTHER COMPLEX, LONG-TERM PROJECTS CAN BE APPLIED TO THE LICENSING OF A HIGH LEVEL WASTE GEOLOGIC REPOSITORY

QA applies to Hearing Board Judges too!





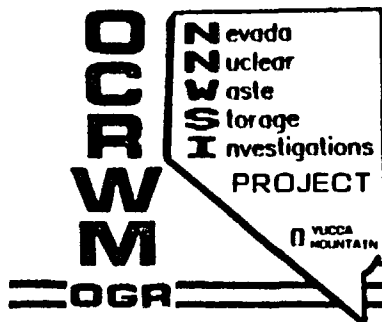
APPLICABILITY OF PAST QA EXPERIENCE
IN LICENSING TO THE NNWSI PROJECT

WHILE MANY PAST LICENSING PRECEDENTS HAVE BEEN BASED IN PART ON DEMONSTRATING THE CAPABILITY OF ENGINEERED SYSTEMS TO WITHSTAND EQUIPMENT AND HUMAN FAILURES AND THE EFFECTS OF NATURAL EVENTS AND PROCESSES IN CONFORMANCE WITH NRC REGULATIONS.

WE MUST SHOW THAT FOR A GEOLOGIC REPOSITORY

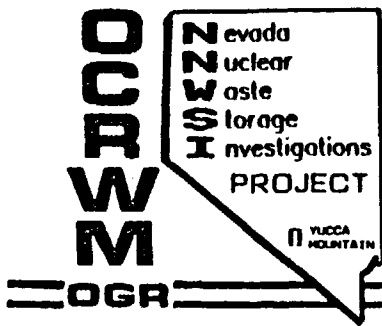
THE NATURAL AND ENGINEERED SYSTEMS TOGETHER WILL ULTIMATELY WORK TOGETHER TO ASSURE THAT WASTE CAN BE CONTAINED AND ISOLATED IN CONFORMANCE WITH NRC AND EPA REGULATIONS.

- o ONLY THE EMPHASIS IS DIFFERENT - THE QA PROCESS IS THE SAME
- o QA IS AN INHERENT PART OF EVERY DESIGN, PLAN, ANALYSIS, REVIEW, CALCULATION AND COMPUTER CODE, AS WELL AS APPLYING TO THE ACTUAL STRUCTURES, SYSTEMS AND COMPONENTS THAT ARE IMPORTANT TO SAFETY



APPLICABILITY OF PAST QA EXPERIENCE CONT.

- QA INVOLVES DOCUMENTATION OF WORK PERFORMED, CHANGES MADE, AND ERRORS CORRECTED
- QA DATA MUST BE CONTROLLED, VERIFIABLE, AND RETRIEVABLE
- THE BOTTOM LINE IS ALWAYS THE UNASSAILABLE CREDIBILITY OF OUR WORK TO THE NRC STAFF AND BOARDS, AND THE FEDERAL COURTS SUCH THAT THERE IS NO REASONABLE DOUBT THAT THE PUBLIC HEALTH AND SAFETY WILL BE ADEQUATELY PROTECTED IN THE EVENT A LICENSE IS GRANTED.



INTRODUCTION TO THE QA CASE STUDIES

- o TWO NRC POWER REACTOR LICENSING PROCEEDINGS WHERE QA HAD A MAJOR IMPACT WILL BE DISCUSSED TODAY:
 - BYRON (NEAR ROCKFORD, IL)
 - SHOREHAM (LONG ISLAND, NY)
- o MANY OTHER EXAMPLES EXIST, THESE WERE SELECTED BECAUSE OF OUR DETAILED KNOWLEDGE OF THESE CASES.
- o POWER REACTORS AND GEOLOGIC REPOSITORIES BOTH REPRESENT LONG-TERM COMPLEX PROJECTS REGULATED BY NRC, AND BOTH ARE REQUIRED TO SATISFY 10 CFR PART 50, APPENDIX B QA CRITERIA.
- o THE BYRON AND SHOREHAM CASES ALSO PROVIDE INSIGHT INTO THE IMPACTS OF CHANGING REGULATORY REQUIREMENT, DESIGNS, AND PLANS (PROJECT INTERRUPTION AND SCHEDULE DELAYS), AND THE COSTS (MONETARY AND TIME) OF RECOVERING FROM THE FAILURE TO IMPLEMENT AN ADEQUATE QA PROGRAM AT THE VERY BEGINNING OF A PROJECT.

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"BOARD SHOCKS INDUSTRY WITH DENIAL OF LICENSE FOR
COMMONWEALTH'S BYRON"

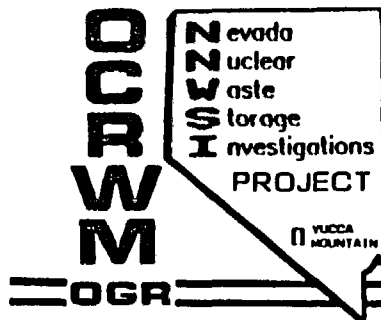
[JANUARY 16, 1984 SPECIAL EDITION OF INSIDE NRC]

"AN ATOMIC SAFETY AND LICENSING BOARD'S DECISION TO DENY COMMONWEALTH EDISON, THE LARGEST U.S. NUCLEAR UTILITY, AN OPERATING LICENSE FOR BYRON -1 AND -2 IS SENDING SHOCK WAVES THROUGH THE INDUSTRY AND ITS OPPONENTS."

"THE DECISION WAS THE FIRST DENIAL EVER BY A LICENSING BOARD, AND COMMONWEALTH EDISON OFFICIALS WERE CONSIDERING APPEAL ROUTES EARLY THIS WEEK IN AN ATTEMPT TO AVOID SUBSTANTIAL DELAYS IN A PLANNED FEB. 15 FUEL LOADING AT BYRON."

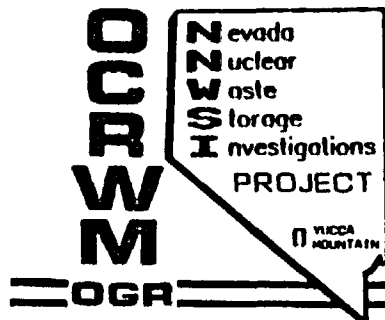
"INTERVENOR SOURCES WERE ALSO STUNNED."

"THE BOARD SAID IT DENIED THE LICENSE BECAUSE COMMONWEALTH FAILED TO PROPERLY SUPERVISE CONTRACTORS' QUALITY ASSURANCE PROGRAMS OVER A PERIOD OF YEARS....THE BOARD SPECIFIED THAT IT HAD NOT FOUND, NOR HAS THE NRC STAFF REPORTED, WIDESPREAD HARDWARE CONSTRUCTION PROBLEMS. BUT WE ARE NOT CONFIDENT THAT SUCH PROBLEMS WOULD HAVE BEEN DISCOVERED. [i.e., LACKS "REASONABLE ASSURANCE"].



"BOARD SHOCKS INDUSTRY WITH DENIAL OF LICENSE
FOR COMMONWEALTH'S BYRON" CONT.

"COMMONWEALTH IS NOT INSTITUTIONALLY INCAPABLE OR UNWILLING TO MAINTAIN AN ADEQUATE QUALITY ASSURANCE PROGRAM', THE ORDER SAID, BUT THE UTILITY SEEMS TO HAVE BEGUN TO MEET ITS QUALITY ASSURANCE RESPONSIBILITIES WITH RESPECT TO ITS BYRON CONTRACTORS VERY LATE."
[EMPHASIS ADDED]



BYRON QUALITY ASSURANCE (QA) CHRONOLOGY

1976-1981: SAFETY-RELATED QA PROBLEMS IDENTIFIED; RAPID
TURNOVER IN QA ORGANIZATION

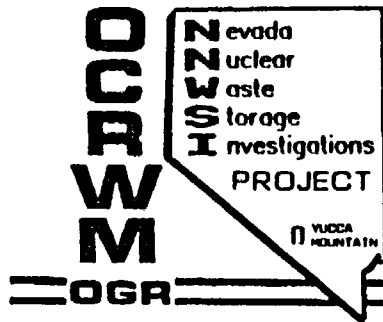
1979: REORGANIZATION OF CORPORATE QA

1982: NRC CONSTRUCTION ASSESSMENT TEAM (CAT)
IDENTIFIES DEFICIENT CERTIFICATION OF QA
INSPECTORS BY EIGHT BYRON CONTRACTORS

: APPLICANT INITIATES QA INSPECTOR RECERTIFICATION
AND REINSPECTION PROGRAM

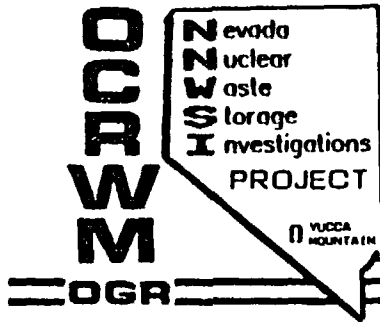
1983: LICENSING HEARING

1984: LICENSING BOARD DENIES OPERATING LICENSE DUE TO
UNRESOLVED QA UNCERTAINTIES



BYRON QUALITY ASSURANCE [QA] CHRONOLOGY

- 1984: APPLICANT PUBLISHES FINAL REPORT ON REINSPECTION PROGRAM
- : APPEAL BOARD REMANDS QA ISSUES TO LICENSING BOARD FOR FURTHER EVIDENCE
 - : LICENSING BOARD ISSUES SUPPLEMENTAL DECISION RESOLVING QA ISSUES
 - : APPEAL BOARD AFFIRMS LICENSING BOARD DECISION TO GRANT LICENSE
- 1985: FULL-POWER LICENSE ISSUED



THE OBVIOUS LESSONS LEARNED FROM THE BYRON EXPERIENCE

- o THE NRC CAN, AND WILL, DENY A LICENSE BASED ON INADEQUATE IMPLEMENTATION OF THE QA PROGRAM
- o AN EFFECTIVE QA PROGRAM, WITH FULL MANAGEMENT AND STAFF COMMITMENT MUST BE CONSISTENTLY APPLIED FROM THE VERY START OF ANY PROGRAM - e.g., SITE CHARACTERIZATION
- o INADEQUATE QA CAN PREVENT A FINDING OF "REASONABLE ASSURANCE" EVEN THOUGH THERE IS NO EVIDENCE THAT DEFICIENCIES OR ERRORS ACTUALLY EXIST
 - THROWS EVERYTHING INTO DOUBT
 - DESTROYS CREDIBILITY
- o DOCUMENTATION AND TRACEABILITY, AT ALL LEVELS, ARE FUNDAMENTAL TO SUPPORTING THE LICENSE APPLICATION
- o RECOVERY FROM QA DEFICIENCIES CAN
 - BE EXPENSIVE
 - TIME CONSUMING
 - RESULT IN ADDITIONAL HEARINGS

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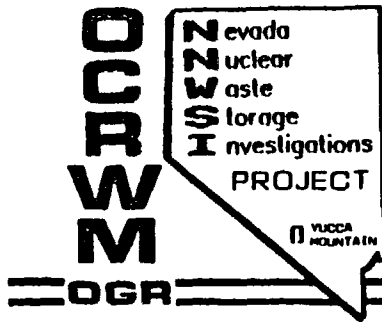
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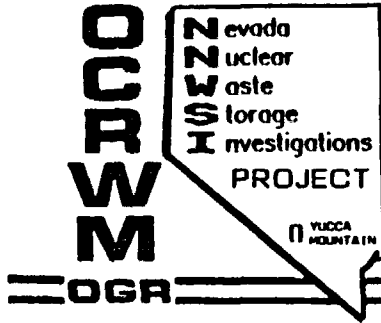
QUALITY ASSURANCE

THE SHOREHAM EXPERIENCE



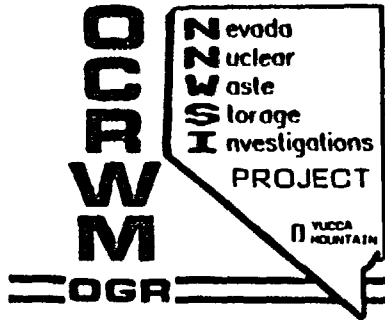
THE OBVIOUS LESSONS LEARNED FROM THE SHOREHAM EXPERIENCE

- o THE ESSENTIAL NEED FOR THE PROJECT TO FULLY DOCUMENT AND CONTROL ALL SAFETY-RELATED" CHANGES MADE IN RESPONSE TO:
 - CHANGING PLANS
 - CHANGING REGULATORY REQUIREMENTS
 - PROJECT DELAYS
- e.g., TRACEABILITY AND VERIFIABILITY
- o THE NEED FOR FULL, DOCUMENTED, AND CONTINUING COORDINATION BETWEEN MANAGEMENT, TECHNICAL PARTICIPANTS, AND THE QA FUNCTION
- o QA MUST BE PART OF THE "PROJECT TEAM" FROM THE VERY BEGINNING:
 - LATE STARTS LEAD TO ESCALATING QA PROBLEMS WHICH MAY ENDANGER A LICENSE APPLICATION IF NOT CORRECTED WELL IN ADVANCE OF HEARINGS



MAJOR "LESSONS LEARNED" APPLICABLE TO NNWSI PROJECT

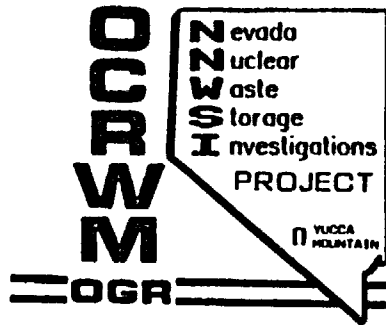
- o FAILURE OF THE QA LINK CAN RESULT IN DENIAL OF THE LICENSE APPLICATION - EVEN IF THERE IS NO HARD EVIDENCE THAT UNCORRECTED DEFICIENCIES (POTENTIALLY EFFECTING PUBLIC HEALTH AND SAFETY) ACTUALLY EXIST;
- o GOOD QA MUST FLOW FROM THE TOP RANKS OF PROJECT MANAGEMENT DOWN THROUGH EVERY LEVEL OF DOE AND CONTRACTOR ORGANIZATIONS TO ALL THE PEOPLE DOING THE ACTUAL WORK, WHETHER MANAGERS, TECHNICAL STAFF, OR CRAFTS PEOPLE;
- o RESPONSIBILITY FOR OPERATION OF CONTRACTOR QA PROGRAMS MAY BE DELEGATED TO THE CONTRACTORS BY DOE, BUT DOE ALONE WILL BE HELD RESPONSIBLE TO SEE THAT THE QA PROCEDURES AND PRACTICES ARE ADEQUATE TO SATISFY 10 CFR PART 50, APPENDIX B (QA CRITERIA);



MAJOR "LESSONS LEARNED" APPLICABLE
TO NNWSI PROJECT CONT.

- o QA DEPARTMENTS MUST BE INTEGRATED INTO "THE PROJECT TEAM," YET RETAIN ADEQUATE INDEPENDENCE FROM SCHEDULES, AND SUFFICIENT MANAGEMENT ACCESS TO ENABLE THEM TO RESOLVE PROBLEMS BEFORE THEY BECOME UNMANAGEABLE AND SERIOUS;
- o QA PROGRAMS MUST PROVIDE FORMAL MEANS FOR DOCUMENTING THE RESULTS OF CHANGES IN PLANS, SCHEDULES AND REGULATORY CRITERIA, AS WELL AS NON-CONFORMING WORK, IDENTIFYING "ROOT CAUSES" (NOT MERELY SYMPTOMS), TRACKING CORRECTIONS, AND TRENDING TO PERMIT EARLY DETECTION AND CORRECTION OF PATTERNS OF PROBLEMS;
- o GOOD QA CAN NOT ONLY SAVE TIME AND MONEY OVER THE LIFE OF THE PROJECT, BUT GOOD QA PRACTICE BY ALL PROJECT PERSONNEL WILL PROVIDE THE "PAPER TRAIL" NEEDED TO RESOLVE MOST SAFETY CONTENTIONS EITHER BY SUMMARY DISPOSITION OR THROUGH ADJUDICATION, EVEN THOUGH RESPONSIBLE PERSONNEL MAY CHANGE OVER THE YEARS.

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BUILDING THE LICENSING CASE

- IMMEDIATE NEEDS -

J. S. SZYMANSKI

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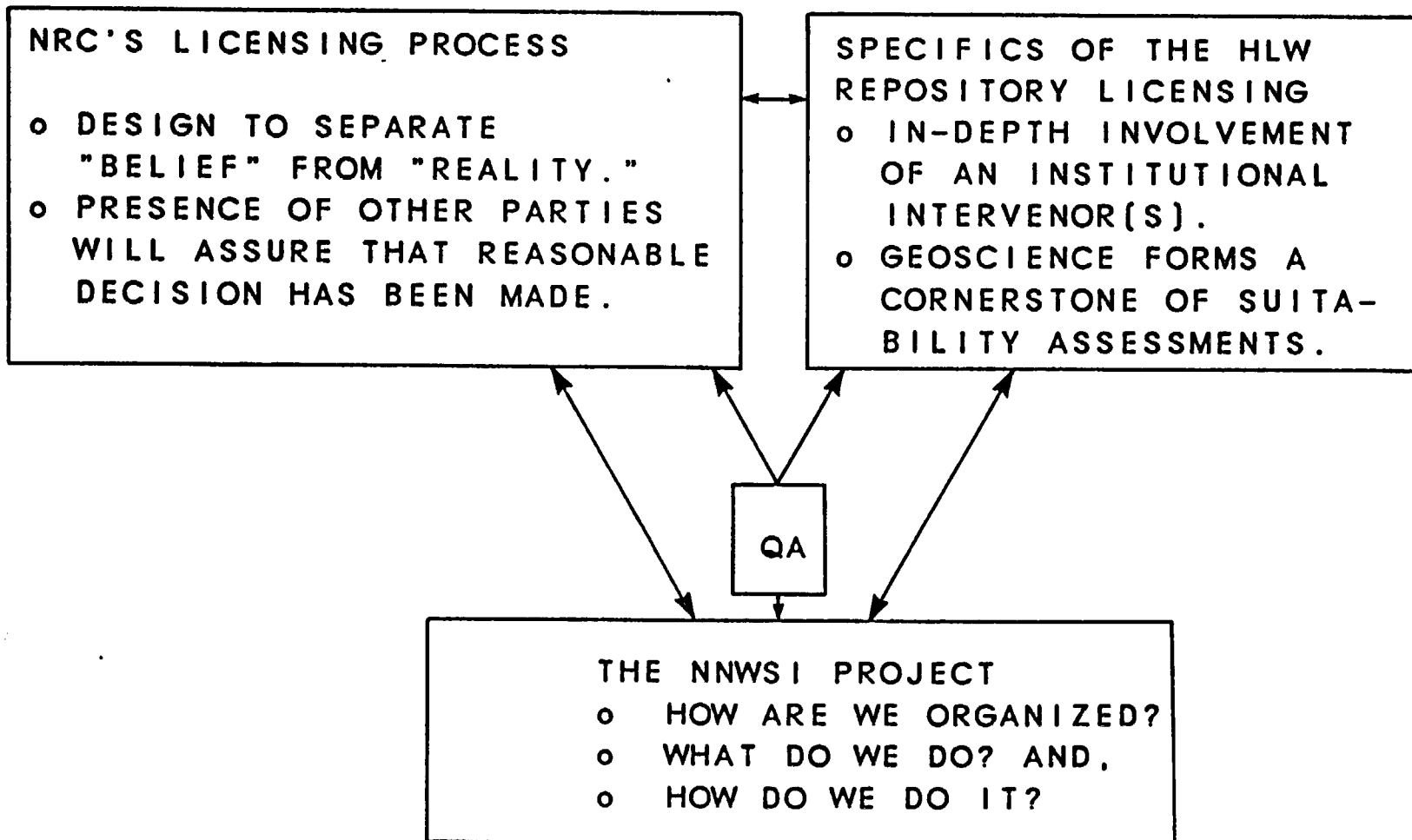
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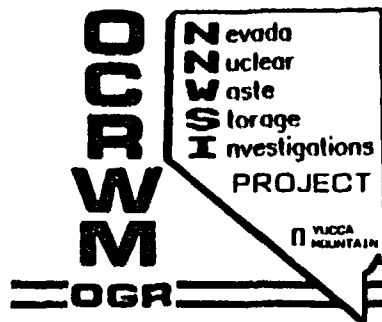
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EMPHASIS OF THIS PRESENTATION
BUILDING THE LICENSING CASE

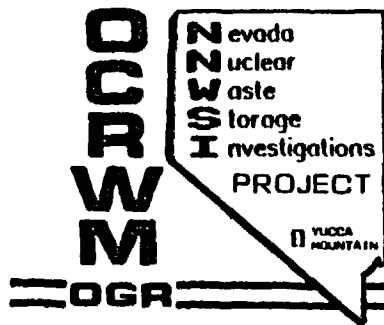


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THE NNWSI PROJECT

- WHAT DO WE DO?
- HOW ARE WE ORGANIZED? AND
- HOW DO WE DO IT?



WHAT DO WE DO?

STATUTORY DOCUMENTS

- o EA
- o SCP
- o SCP PROGRESS REPORTS
- o ISSUE RESOLUTION PAPERS
- o LA



. THIRD LEVEL OF INTEGRATION

PROJECT POSITIONS

- o COMPLIANCE STRATEGIES
- o DESIGN BASIS AND REQUIREMENTS
- o CONCEPTUAL AND NUMERICAL MODELS



. SECOND LEVEL OF INTEGRATION

REFERENCE DATA BASE

- o STATUS REPORTS
- o DATA REPORTS



. FIRST LEVEL OF INTEGRATION

RAW DATA

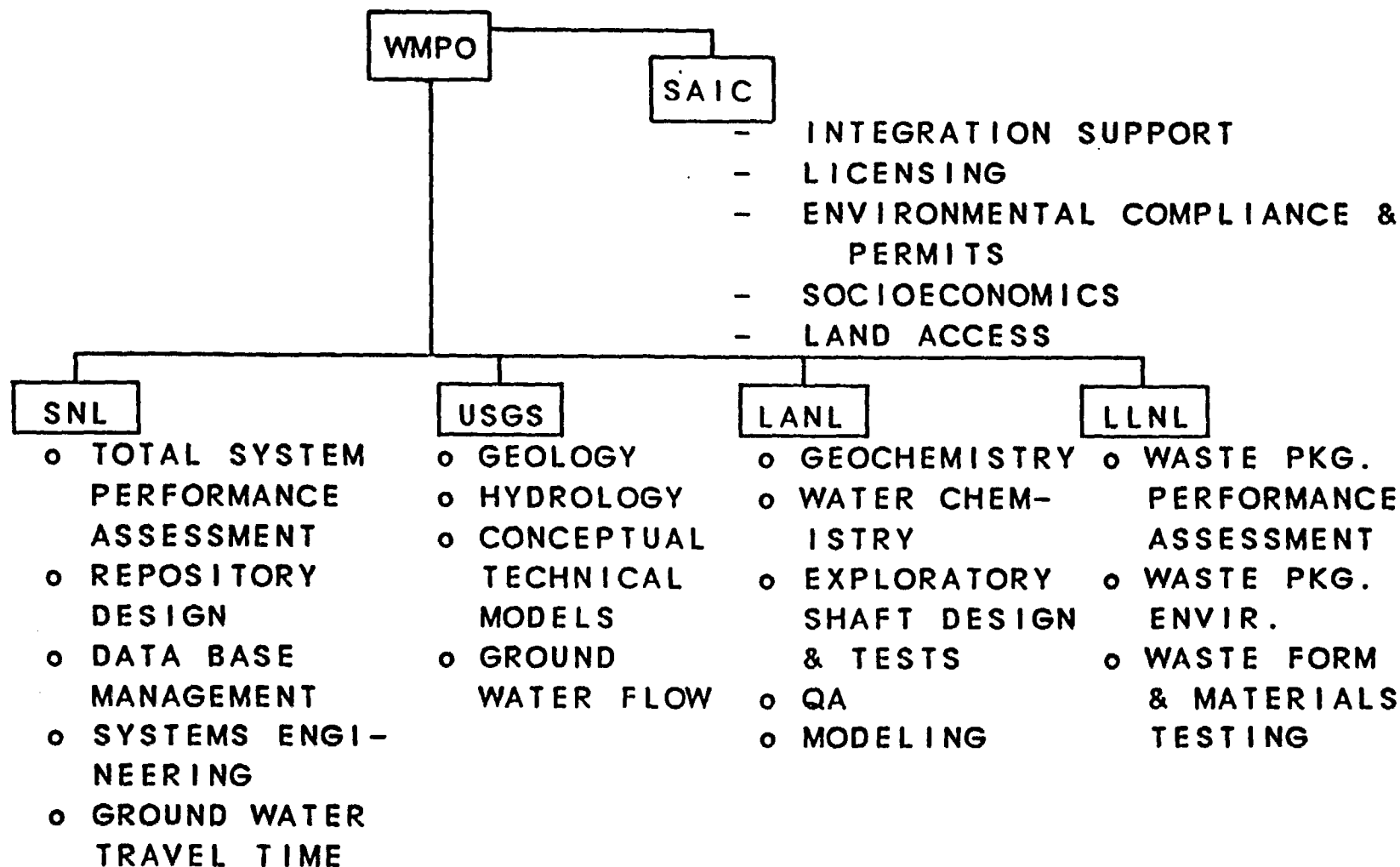
- o OBSERVATIONS
- o MEASUREMENTS
- o CALCULATIONS

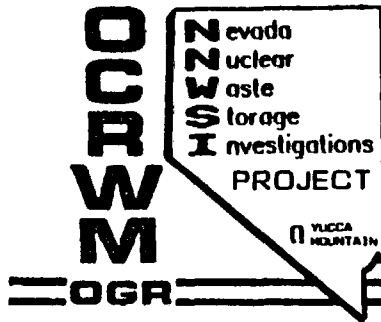
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CHARACTERISTICS OF THE PROJECT ORGANIZATION

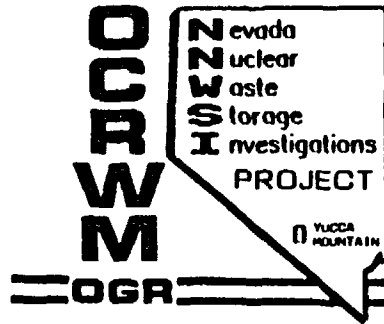




ORGANIZATION AND RESPONSIBILITIES OF THE NNWSI PROJECT

COMPARTMENTALIZED ORGANIZATION WHICH MAY HAVE A POTENTIAL
FOR LIMITING

- o PROJECT WIDE VISIBILITY OF THE "RAW DATA" AND
CONSEQUENTLY
- o COMPLETE AND CORRECT TRANSLATION OF THIS DATA BASE
INTO "STATUTORY DOCUMENTS" VIA
 - 1) REFERENCE DATA BASE AND
 - 2) PROJECT POSITIONS

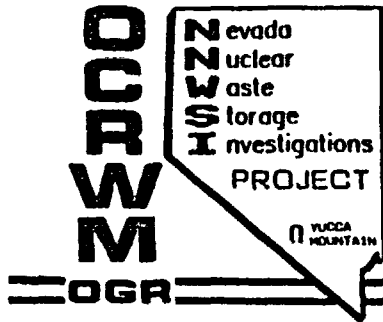


HOW DO WE DO IT?

THE NNWSI PROJECT QA CONTROLS

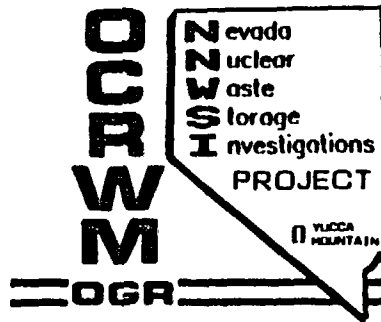
- EMPHASIS ON ASSURING TRACEABILITY OF THE "RAW DATA"
- LIMITED INVOLVEMENT IN ASSURING PROJECT WIDE VISIBILITY AND COMPLETENESS OF THE "RAW DATA" AS WELL AS COMPLETE AND CORRECT TRANSLATIONS OF THESE DATA INTO "STATUTORY DOCUMENTS."

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THE NRC'S LICENSING PROCESS

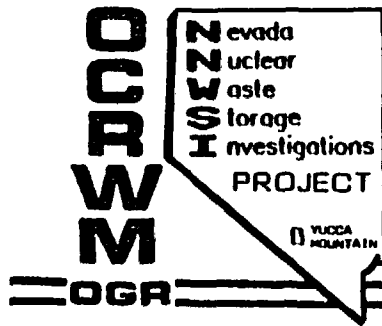
- o SUMMARY; AND
- o LICENSING CONCERNS



SUMMARY

THE LICENSING PROCESS IS:

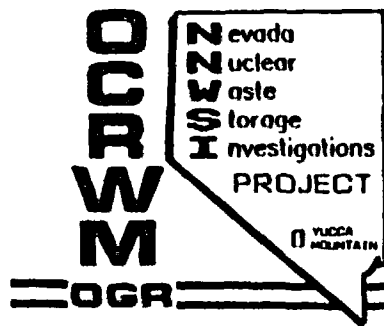
- o DESIGNED TO GET TO THE BOTTOM OF A GIVEN LICENSING CONCERN AND/OR ISSUE;
- o MAY BE STRIPPED OF "POLITICAL" CONCERNS; AND
- o IT'S EFFECTIVENESS IS A RESULT OF INTERACTION BETWEEN "SUPPLY PUSH," i.e., ACTIONS BY THE APPLICANT AND "DEMAND PULL," i.e., ACTIONS BY THE INTERVENOR



SUMMARY

CREDIBILITY OF THE PROJECT IS GIVEN IF:

- A) VALID DATA BASE IS BEING USED,
- B) COMPLETE DATA BASE IS BEING USED, i.e., SELECTIVE VIEWING OF THE DATA IS ELIMINATED,
- C) TRANSLATION OF THE "RAW DATA" INTO THE "REFERENCE DATA BASE" IS REASONABLE, i.e., NOT VIA PROCESS OF "WISHFUL" THINKING,
- D) TRANSLATION OF THE "REFERENCE DATA BASE" INTO THE "PROJECT POSITIONS" IS LIKEWISE REASONABLE, AND
- E) "PROJECT STATUTORY" DOCUMENTS ARE BASED ON VALID AND COMPLETE DATA BASE AS WELL AS REASONABLE INTERPRETATIONS OF THIS DATA BASE



LICENSING CONCERN

EROSION AND EVENTUAL LOSS OF CREDIBILITY LEADING TO
REJECTION OF LICENSING APPLICATION

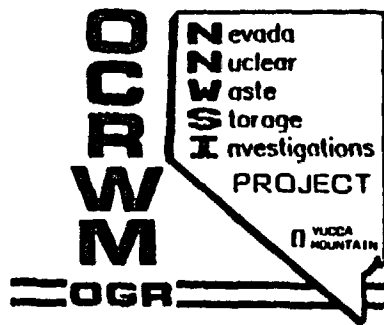
PROMOTING FACTORS

INSTITUTIONAL REVIEWS OF THE PROJECT "STATUTORY
DOCUMENTS" i.e., EA'S, SCP'S

PREVENTING FACTOR

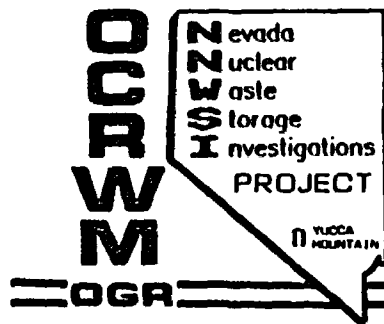
DEFENSIVE ACTIONS OF THE PROJECT

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SPECIFICS OF LICENSING THE HLW REPOSITORY

- IMPORTANCE OF GEOSCIENCE DATA AND INFORMATION, AND
- INVOLVEMENT OF INSTITUTIONAL INTERVENORS, IN OUR CASE THE STATE OF NEVADA.



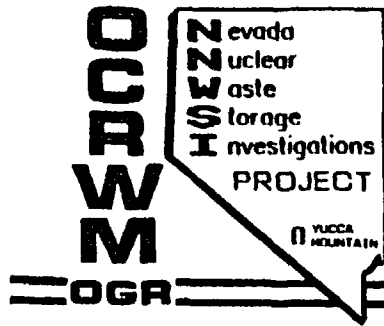
IMPORTANCE OF GEOSCIENCE DATA

D. L. VIETH

"DESCRIPTION OF THE EARTH"

GEOSCIENCE DATA AND THEIR INTERPRETATIONS ARE THE MOST IMPORTANT COMPONENTS OF DEMONSTRATING COMPLIANCE OF A GIVEN HLW REPOSITORY WITH REGULATORY REQUIREMENTS SET FORTH IN 10 CFR 60

GEOLOGY AND HYDROLOGY



INVOLVEMENT OF OTHER PARTIES

INSTITUTIONAL INTERVENOR, i.e., THE STATE OF NEVADA

- ATTITUDE
- RESOURCES AND COMMITMENTS
- INTENTIONS (EMPHASIS AND DIRECTION)
- LIKELY STRATEGY

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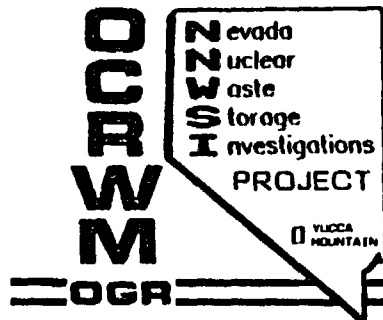
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ATTITUDE

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NEGATIVE

IN CONTRAST TO THE NNWSI PROJECT FUNDAMENTAL OBJECTIVES

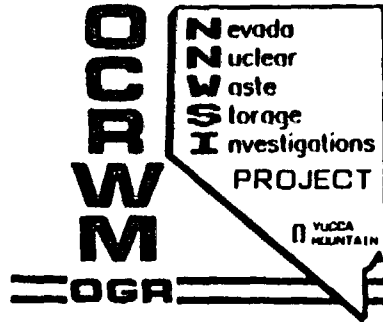


STATE RESOURCES AND COMMITMENTS

- o CURRENT STAFFING
 - NWPO PERMANENT STAFF ~ 21
 - NWPO CONSULTANTS ~ 9
- o LEGAL SUPPORT
 - SPECIAL DEPUTY ATTORNEY GENERAL
- o TECHNICAL SUPPORT - PARTIAL LISTING
 - UNIVERSITY OF NEVADA, DRI, SARGENT AND LUNDY, MIFFLIN AND ASSOCIATES, WESTERN INTERSTATE ENERGY BOARD
- o ESTIMATED TOTAL FUNDING AT LICENSE APPLICATION TIME
 - \$150-200 MILLION

BY COMPARISON

- INTERVENORS/PARTIES IN OTHER LICENSING PROCEEDINGS
GENERALLY FUNDED AT \$100,000 OR LESS

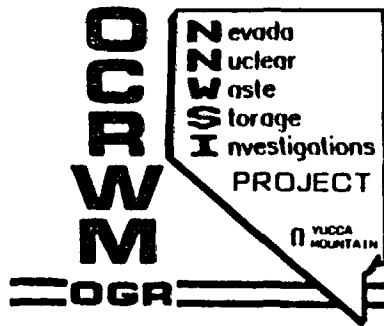


INTENTIONS

EMPHASIS - RAW DATA

- o REPEATED REQUESTS FOR DATA
- o PUBLIC STATEMENTS OF THE OTHER PARTIES

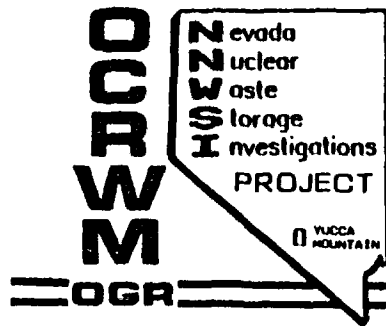
"IN ANOTHER SIGNIFICANT AREA WE ARE CONFUSED AS TO THE ROLE WHICH THE DEPARTMENT PROPOSES THAT THE NATIONAL ACADEMY OF SCIENCE IS TO PLAY IN THE SITE CHARACTERIZATION PROCESS. IT WAS ORIGINALLY OUR UNDERSTANDING THAT THE NAS WAS ASKED TO ACT AS A TECHNICAL REVIEWER OF THE ADEQUACY OF THE DEPARTMENT'S CHARACTERIZATION ACTIVITIES AT THREE SITES; AS SORT OF A SUPER PEER REVIEWER, IF YOU WILL. MORE RECENTLY, HOWEVER, WE ARE ADVISED THAT THE ACADEMY DOES NOT INTEND TO INDEPENDENTLY EXAMINE DOE'S RAW DATA, UPON WHICH MANY OF ITS CHARACTERIZATION ACTIVITIES AND DECISIONS WILL BE BASED.



INTENTIONS CONT.

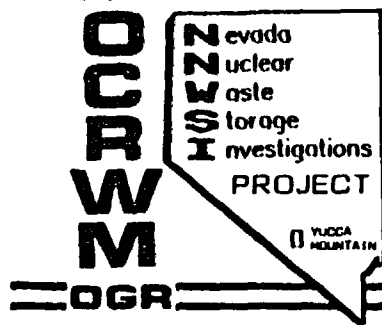
IT IS PRECISELY IN THAT AREA, OF COURSE, THAT MANY OF OUR, AS WELL AS THAT OF YOUR STAFF'S, MOST FUNDAMENTAL CONCERNS WITH DOE'S TECHNICAL PROGRAM LIE. WHAT SORT OF MEANINGFUL CONTRIBUTION CAN THE ACADEMY MAKE IN THIS AREA IF THEY ARE TO IGNORE TOTALLY ANY PROBLEMS ASSOCIATED WITH THE DEPARTMENT'S UNDERLYING DATA?"*

* STATEMENT OF MALACHY R. MURPHY, SPECIAL DEPUTY ATTORNEY GENERAL, STATE OF NEVADA BEFORE THE U.S. NRC, JUNE 16, 1987



INTENTIONS CONT.

- DIRECTION - GEOSCIENCE DATA OR, IN D. VIETH'S TERMINOLOGY,
"DESCRIPTION OF THE EARTH"
- EA REVIEW
- STATE OF NEVADA GRANT REQUEST



LIKELY STRATEGY OF THE STATE OF NEVADA

POINT OF ATTACK

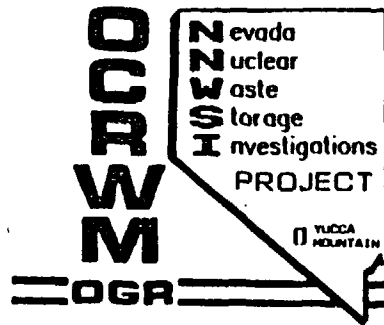
STATUTORY DOCUMENTS, i.e., EA, SCP, SCP PROGRESS REPORTS AND LA

- o DEMONSTRATE THAT THESE DOCUMENTS WERE DEVELOPED BASED ON:

- A) SELECTIVE UTILIZATION OF THE "RAW" DATA, AND
- B) INCOMPLETE AND/OR INCORRECT TRANSLATION OF (I) THE "RAW" DATA INTO REFERENCE DATA BASE, (II) "REFERENCE DATA BASE" INTO PROJECT POSITIONS, AND CONSEQUENTLY (III) PROJECT POSITIONS INTO "STATUTORY DOCUMENTS"

OBJECTIVE

INITIATE AND SUSTAIN ONGOING LOSS OF CREDIBILITY OF THE NNWSI PROJECT



FIRST STEP

- BUILDING THE LICENSING CASE
- FROM THE P.I.'S; PERSPECTIVE
- MANAGEMENT'S PERSPECTIVE

**O
C
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

BUILD AWARENESS AT INVESTIGATOR'S LEVEL

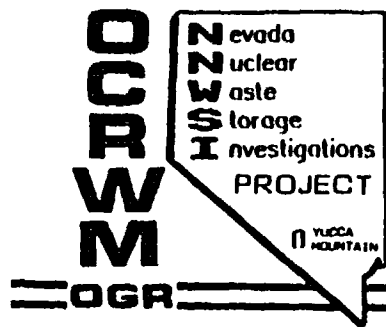
- o RAW DATA

DEFENSE OF THE DATA

- ACCOUNTABILITY

ADMISSIBILITY OF THE DATA

- TRACEABILITY



PROJECT LEVEL

- o BROADENING QUALITY ASSURANCE CONTROLS
 - EARLY VISIBILITY OF TOTAL DATA BASE
 - COMPLETE AND CORRECT TRANSLATION OF DATA INTO STATUTORY DOCUMENTS VIA

REFERENCE DATA BASE

AND

PROJECT POSITIONS

NNWSI PROJECT LICENSING BRIEFING

R. GOTCHY - L. BRENNER

The Role of Quality Assurance (QA) in NRC Hearing Decisions

A. Introduction

We have included in your written materials excerpts from Licensing and Appeal Board decisions on QA issues which were hotly litigated in the Byron and Shoreham nuclear power plant hearings. These excerpts show you the extensive breadth and depth of QA issues. And that is only where QA was the issue itself. QA issues also permeate every other effort including how you have prepared the expert analyses presented in your testimony. QA is far from limited to "hardware" type issues. It is an inherent part of every process, assessment, calculation, drill core logging, etc., which you as an individual perform and check, and which your organization verifies, coordinates, and keeps in an information base. The data in an information system in turn must demonstrably be controlled, updated, coordinated, traceable, and retrievable. QA applies to Judges too!

We've seen QA issues in case after case, and it is our view that when the construction and operations personnel view themselves as the "doers", and view the QA staff as a separate entity, "a necessary evil" to be tolerated only to the minimum degree necessary, then trouble with a capital "T" has arrived at our door step. Remember, QA can only be as good as we let it be. Good QA must be part of the DOE and supporting contractors' mission, and QA personnel must be well qualified, fairly compensated, and viewed as essential partners in assuring that the quality standards clearly (not just arguably) have been met. This can easily be shown by good records of what was done at each step of the way. This is especially important in an extended project where there will be turnover of expert personnel requiring other experts to support the validity of their predecessor's work ("ownership" of data).

You think you're too busy to worry about traceability and verifiability of what you're doing now? Then you'll always feel that way, even more so as you advance into site characterization. Our advice is, change your attitude now, or find another line of work, because you'll not only cause self-destruction someday of your valuable work, but you'll cause the denigration of the work of your colleagues. Bad QA is like the proverbial bad apple in

the barrel in the perception of others, including the NRC and its licensing boards. Those of you who are geologists, let me tell you! You think it takes a long time for mountains to form? Come to a hearing where the evidence begins to unveil existing defects, or even gaps in QA coverage, and in a flash you'll see mountains of litigation spring up out of what started out as molehills of issues.

During the next 25 minutes, we will present our reviews of two historic QA decisions, our perceptions of what went wrong, when, and why. Then we will discuss how these problems were resolved, and the relevant lessons that were learned from those projects.

B. Byron Case

January 16, 1984, Special Issue of Inside NRC:

"BOARD SHOCKS INDUSTRY WITH DENIAL OF LICENSE
FOR COMMONWEALTH'S BYRON"

"An Atomic Safety and Licensing Board's decision to deny Commonwealth Edison, the largest U.S. nuclear utility, an operating license for Byron -1 and -2 is sending shock waves through the industry and its opponents.

"The decision was the first denial ever by a licensing board, and Commonwealth Edison officials were considering appeal routes early this week in an attempt to avoid substantial delays in a planned Feb 15 fuel loading at Byron.

"Intervenor sources were also stunned.

"The board said it denied the license because Commonwealth failed to properly supervise contractors' quality assurance programs over a period of years.The board specified that it had not found, nor has the NRC staff reported, widespread hardware or construction problems. But we are not confident that such problems would have been discovered. [i.e., lacks "reasonable assurance"].

"Commonwealth is not 'institutionally incapable or unwilling to maintain an adequate quality assurance program', the order said, but the utility 'seems to have begun to meet its quality assurance responsibilities with respect to its Byron contractors very late'" (emphasis added).

What went wrong - when and why:

Numerous QA problems with several contractor organizations began to surface at Byron many years in advance of the OL hearings. In 1977 (6 years before the hearings began) there were obvious QA problems with safety-related electrical and control equipment (e.g., cable trays and supports, instrument racks, and main and local control boards), concrete and structural steel, and electrical cables. Other contractors, such as for HVAC and piping, also had marginal or inadequate QA programs in the early days of their work. These problems were exacerbated by rapid turnover of QA personnel to higher paying jobs in construction of Byron. As noted in the Viewgraph, the applicant reorganized Corporate QA in 1979 in an unsuccessful attempt to gain control over these early problems.

However, it is important to remember that the record did not establish the actual existence of any uncorrected construction deficiencies of potential safety significance. Rather, the lack of a demonstrably effective QA program precluded the "reasonable assurance" finding (required by the Atomic Energy Act) that any and all serious construction deficiencies had been found and corrected.

Those early QA problems were generally traceable to a lack of adequate QA oversight by the applicant and its contractors, a lack of independence of QA managers, and a lack of accessibility to top management (i.e., QA was relegated to the back burner and ignored). Although Appendix B to 10 CFR Part 50 permits an applicant to delegate the execution of its QA program to its many contractors, the responsibility for the overall success (or failure) of the contractors' QA efforts remain with the applicant. In the case of Byron, it appears, as the Board noted, that although the applicant itself had an overall QA organization within the corporate organization that

was "well-designed to provide quality assurance services in accordance with 10 CFR Part 50, Appendix B", it failed to assure that its contractors carried out their delegated quality assurance tasks. (LBP-84-2, 19 NRC 36, 42-44 (1984)). Many of these contractor problems involved sloppy documentation and failure to track and trend faulty work, "fraudulent and ineffective" QA programs, and failure to assure proper qualification, training, and certification of QA/QC inspectors.

In spite of these early failures, the Licensing Board did not conclude that the applicant was unable or unwilling to maintain a reliable QA program. Rather, the Board believed the applicant "began to deal effectively with its contractors' problems too late, but is catching up". A deeper understanding of these problems can be achieved by reading the excerpts in your handout.

How the QA problems were resolved:

As a result of the 1982 NRC Construction Assessment Team (CAT) identification of QA inspector certification deficiencies the applicant realized that its only recourse to demonstrate acceptable construction quality was to reinspect, to the extent possible, those structures, systems and components that are important to safety, and to demonstrate that its QA inspectors had been properly qualified to do their work, and had, in fact, done so. The applicant's response was the Byron Reinspection Program, which focused on the work done during the problem years preceding 1982. 1982 was a cutoff date because the applicant carried out a QA inspector recertification program between mid-1982 and early 1983. That program involved establishment of revised criteria for QA personnel and implementation of new procedures to assure that individuals participating in the reinspection program were qualified to do so. For many of the smaller contractors it was possible to do essentially a 100% reinspection of their construction efforts. However, for the large electrical and piping contractors at Byron, a 100% reinspection effort was physically impossible to perform, since much of their work was obscured by concrete, conduits, etc. As a result, a random sample of their QA inspectors early work was selected for reinspection, and the work of certain inspectors found questionable by the NRC was also reinspected. Reinspectors were carefully managed so as to prevent them from reinspecting work they had previously

inspected, and all reinspections were audited by an independent testing agency.

These reinspections of a representative sample of the safety-related work previously found acceptable by the QA/QC inspectors whose work was in question, were performed on work originally inspected during the first 90-day period of each inspector's work. The earliest work was selected to evaluate the inspectors' performance during the time of least proficiency (i.e., when they were still learning their trade). If the individual performing the reinspection agreed with at least 95% of the original inspectors decisions on objective attributes (e.g., measured "as built" dimensions, etc.), and 90% for subjective attributes (e.g., qualitative visual weld examinations), the original inspector was considered qualified regardless of record deficiencies (e.g., improper or missing certifications,). If the reinspection reflected an unacceptably high error rate in a particular area of inspection (e.g., welding) the original inspector's work was reexamined over the next 90 days of work. If that reinspection was unacceptable, all of the original inspector's remaining work in that area that was still accessible would be reinspected.

In August 1983, the NRC Licensing Board heard evidence on the preliminary development of reinspection sampling criteria and procedures, and the current status of the recertification and reinspection programs. But when the evidentiary record closed later that month, the reinspection program was still in progress.

By the end of December 1983, the Board and NRC staff had only a preliminary report on the results of the reinspection program (which was not in evidence and therefore could not be considered in the Board decision). Rather than awaiting publication of the final reinspection report and reopening the hearing to determine if the results of that two-year, multi-million dollar effort provided the "reasonable assurance" they found lacking when the record closed, the Board issued its January 1984 decision (which found for the applicant on essentially all the non-QA issues), declining to issue an operating license.

In its May 7, 1984 decision on Commonwealth Edison's appeal of the Licensing Board's decision (LBP-84-2, 19 NRC 36 (1984)), the Byron Appeal

Board remanded the record to the Byron Licensing Board to hear further evidence regarding the applicant's QA shortcomings. (ALAB-770, 19 NRC 1163 (1984)). Of special importance were the results of a large reinspection effort at Byron designed to determine if "as built" quality had been seriously affected by the QA failures. The Byron Reinspection Program was completed after the Licensing Board had closed the hearing record, and, therefore, the results had not been considered by the Licensing Board in its decision.

Following the Appeal Board remand, the Licensing Board subsequently was able to reach a reasonable assurance finding, and authorized the issuance of a full-power license for the Byron station. (LBP-84-41, 20 NRC 1203 (Oct. 16, 1984)).

Having retained jurisdiction of the applicant's appeal of the initial decision, the Appeal Board quickly affirmed the supplemental initial decision, and the initial decision on "issues other than construction quality assurance". (ALAB-793, 20 NRC 1591 (Dec. 20, 1984)).

The operating license was issued in February 1985. However, there were some expensive lessons, in terms of cost (100's of millions of dollars due to delays, finance charges and lost revenues), that are relevant to the NNWSI Project. We will review those "lessons learned" following the Shoreham discussion next, by Judge Brenner.

C. Shoreham

Attached to your handout are relatively brief excerpts from over 600 pages of a Licensing Board decision involving, among other things, vigorously contested Quality Assurance (QA) issues related to the construction, preoperational testing and proposed operation of the Shoreham nuclear power plant. Long Island Lighting Co., (Shoreham), LBP-83-57, 18 NRC 445 (September 21, 1983).

The excerpts are from the published "opinion" portion of the decision, which summarizes and reaches conclusions based on the more extensive unpublished "findings" which are referenced. These excerpts have been

chosen to give you a feel for the breadth and depth of QA issues in litigation. The table of contents (for both the published opinion and the unpublished findings), along with the introduction and summary of the contentions (issues) should give you a good idea.

The opinion on the so-called "specific subjects" of the utility's (LILCO's) audit and surveillance program demonstrate that QA involves more than fabrication, installation and inspection of hardware. It involves calculations, drawings, document control and updating, and reports on all changes, with proper assessments, coordinations and approvals.

The NRC Staff's role was also litigated both as a check on LILCO compliance and in order to judge the weight to be given to the Staff's views on QA for the Shoreham plant. You will read excerpts on this in the Construction Assessment Team (CAT) and Readiness Assessment Team (RAT) inspection subjects in the attachment.

The "name of the game" in QA is traceability and verifiability, through controlled and audited records as people come and go, of the quality of hardware, construction work, supporting data such as calculations, processes of design and installation, tests and inspections. One of the keys is how the organization analyzes deficiencies when the QA program, as expected, discovers them, in order to not only correct the example discovered, but to assure sufficient analyses to identify the "root cause" of the problem in order to be able to deduce where else it exists and correct it, and in order to avoid future recurrence of similar problems.

What went wrong--when and why:

Unlike Byron, the Licensing Board in the Shoreham operating license case found that, despite problems over the many years of planning and construction of the project, by the time of the hearing the QA was acceptable, met the regulations, and provided reasonable assurance that operation of Shoreham would not present an undue risk to the public health and safety. Like Byron, at Shoreham there were many instances of lack of control of design and construction activities, contrary to the way the QA program was supposed to work.

Shoreham was complicated by the fact that the project was put on hold for many years after construction had begun. Later, the QA program was not effectively revived as quickly as the construction program. Also, many changes were made in the project, partly due to regulatory changes and partly to changes in technology and changes to the utility's plans. The net effect of all this was that the "as built" nuclear power plant was much different than the originally controlled design. The vast numbers of changes had to be approved for QA control, but the QA program was not properly tracking them through such mechanisms as QA approval change requests, and later, integration into updated "as built" plans and drawings. Tracking of QA was getting vaguer and coordination among different organizations designing and constructing various parts of the plant was breaking down, as was coordination of QA with design and construction activities. In addition, coordination between job-site QA and QA of the main architect-engineer and the utility was not working as it should have. In fact, even documents being reviewed by the NRC Staff, such as the Safety Analysis Report, were not always timely updated.

The result was that during a time-frame many years into construction, but still several years before the operating license hearing and completion of Shoreham, it would have been difficult to verify, because of lack of traceability and control, the QA of the as-built facility. This cut across all disciplines of construction, from piping, to electrical work, to calculations of the seismic integrity of systems, to the supposed update of the drawings of the as-built plant.

How the QA problems were resolved:

Through a large-scale effort, the utility and its architect-engineer systematically traced all the change requests, verified the supporting bases, such as calculations, assured that the as-built condition of the power plant was correctly reflected in the drawings and the documents, walked-through systems of particular concern, hired outside groups to verify in-depth the condition of some systems and the acceptability of all the QA work and records for those systems. In general, the project was brought back into proper synchronization and coordination among design, construction and QA work, along with verification that significant defects did not remain in

the as-built plant due to the past lack of proper QA. This was done in time to be part of the evidence considered in the hearing by the Licensing Board.

You can appreciate, I am sure, how costly it is in terms of not just a tremendous amount of money, but time (measured in years), pressure on personnel, cost in credibility before and at a hearing, scope and length of a hearing, and possible denial of a license, to lose proper QA and then have to try to regain it and verify the past work. Proper QA should always be emphasized, for it can, step by step, be cumulatively lost before you know it. Once lost, the loss is not easily remedied.

D. Lessons Learned and Applicability to Licensing a Geologic HLW Repository

If time permitted, we could regale you with other cases where poor QA has either caused serious and expensive delays (e.g., Diablo Canyon where one unit's seismic support system should have been built as a mirror image rather than as a duplicate of the other), or caused outright abandonment (e.g., Zimmer; complete breakdown of QA program). However, the lessons learned are very much alike. By reading through the excerpts of Byron and Shoreham, you will find more than ample support for the "lessons learned" as summarized below:

- o Good QA must flow from the top ranks of project management down through every level of the applicant's and contractors' organizations;
- o It requires a commitment to excellence that carries down from top corporation and operations managers to all the people doing the actual work, whether technical staff or crafts people;
- o It must have adequate independence from construction and other work efforts and schedules, and access to upper management to resolve problems before they become unmanageable and serious;

- o Good QA practice and procedures will provide the "paper trail" needed to resolve most safety contentions either by summary disposition or through adjudication, even though responsible personnel will change over the years;
- o Responsibility for operation of contractor QA programs may be delegated to the contractors by an applicant, but the applicant alone is responsible to see that the procedures and practices are adequate to satisfy 10 CFR Part 50, Appendix B (QA criteria);
- o To assure itself that its desires for an effective QA program are implemented, an applicant must establish an internal QA organization capable of surveillance, audits, etc., and of responding to QA problems identified by the NRC during design, construction, and operation of a geologic repository in a timely and conscientious manner;
- o QA programs must provide formal means for documenting non-conforming work, identifying the root causes (not merely the symptoms), tracking corrections, and trending to permit early detection of patterns of problems in order to avoid expensive and time-consuming remediation late in the Project;
- o Good QA can save both time and money over the life of the Project;
- o Most QA contentions will come from a relatively few sources;
 - (1) NRC inspection reports
 - (2) Applicant QA audit results
 - (3) Applicant corrective action reports
 - (4) Current and former Project employees
- o All QA issues raised by Project employees must be carefully investigated, resolved, and reported to NRC. Attempts to coverup, etc., are illegal and only create greater problems, costs and delays.
- o Integration of QA organizations into the "Project Team" is needed to assure proper respect for QA personnel and maximum effectiveness of QA practices and procedures.

NNWSI PROJECT LICENSING BRIEFING
LARRY BRENNER

NRC Hearings and You

(or, What's an expert like you doing in a place like this?)

A. Introduction

Why are you here? What am I doing here? After all, NRC hearings are years away.

1. The work you are doing now could well be part of the hearing. NRC hearings often focus on work done years before. In order for you to communicate effectively as a witness at a hearing, you had better begin now to think about the way you are going about your work.
2. For example, what are the bases for your conclusions? Are you documenting them, so that someone reviewing your work can see that your conclusions are based on logical, well-supported facts; which facts in turn are logically based on documented, verifiable sources.
3. As another example, will some of your data be based on field studies and sampling, such as drill cores? Then you need to know now, years before the hearing, that those cores, or samples of anything, have to be catalogued and maintained in a verifiable, traceable system, and that includes a quality assurance system which checks this.

We will have more to say about QA later.

4. My message is simple: missing links, or unverifiable links which are no better than missing ones and arguably worse, cannot be corrected easily, if at all, as you begin your final preparation a few short months before the hearing even if you are the smoothest, smartest, (not to mention most modest) witness ever to come down the pike!

B. Planning for Successful Adjudication

I do not expect you to remember, especially years from now, everything we will tell you today. But you will be given some written materials, and I hope you agree that it is in your own best interest to read them soon, and then review them from time to time.

The "logic of the law" may be very different from the scientific reasoning process you are used to. Therefore, information material (relevant) to the legal question may not be material to your technical approach, and vice-versa. I have included in the written materials a satirical decision in the case of Regina v. Ojibway to illustrate this different logic.

I would like you to keep a few of the key points in mind, as you do your work from now on:

Think about:

1. Will you obtain peer review of your work at critical junctures ?
2. Will your work verifiably illustrate (i.e., including documentation) that you kept an open mind, that you were alert for differing possible conclusions at critical junctures, and that you reasonably investigated such other possibilities before reaching your conclusions?
3. How will you explain your work, especially the logical steps which support your conclusion, to someone who is not an expert in your field ?
4. How will you assure that the supporting field data, literature sources, scientific principles, and whatever else you base your analyses on, will always be available for someone else to check, especially in an extended project as people come and go?

5. How will you explain to a non-expert why you did not need to perform further analyses, or gather further data, to reach your conclusions?

C. Definition of an Expert Witness

It has been said that an expert is someone who knows a lot about little. Since a lawyer is someone who knows little about lots of things (and demonstrates this at every opportunity), you can see there is a good basis, and a great need, for a cooperative, symbiotic relationship among the lawyers and experts working together. Another definition of an expert witness is someone giving testimony more than 100 miles from home, and getting paid to do it. In reality, an expert witness is someone who is demonstrably qualified by education or experience to have special knowledge to tell about facts and reach judgments based on those facts.

D. Differences between NRC "administrative law" hearings and typical civil or criminal court trials:

1. NRC hearings are multi-party rather than two party
2. "Relaxed" rules of evidence for NRC hearings. The reality is the rules of evidence are adjusted always in the direction of permitting a more rigorous, probing inquiry of a witness than would otherwise be possible. This is especially true for applicants' expert witnesses who must bear the burden of proving clearly that the applicant has satisfied all the requirements.
3. Instead of a single judge, or a judge and jury, there is a Licensing Board of three judges: two technical experts and a lawyer who is the Chairman of the Board.

There is also the possibility of other judges assisting as expert questioners and advisers on particular subjects, or more than one Board presiding over different groupings of issues at separate hearings.

4. In a "normal" court trial, even the abnormal ones you may have seen on TV, the witnesses testify and the lawyers argue. It should be the same for administrative hearings, but there's a mocking definition of an administrative hearing as a "trial where the lawyers testify and the witnesses argue." That happens. It's wrong when a lawyer lapses into testifying, although the lawyer's testimony is sometimes so absurd as to become funny. It's much less tolerated for a witness to lapse into argument with a questioner. By the way, it's a judge's job not to laugh at a lawyer's argument or a witness's testimony, no matter how absurd. It's your job as a witness not to make the judge's job hard.
- E. NRC adjudicatory hearings are marked by length and complexity, and complexity and length, and length and ... you get the idea!
1. A very lengthy prehearing phase (with important roles for experts)
 - a. Issue ("contention") identification (scoping).
 - b. Discovery (Negotiated Rulemaking, interrogatories, depositions). (10 CFR 2.740.)
 - c. Summary disposition (judgment) on the pleadings. (10 CFR 2.749.)
 - d. Prehearing conferences with Licensing Board and the parties. (10 CFR 2.751a and 2.752.)
 - e. Informal meetings and negotiations among parties. (10 CFR 2.756.)

- f. Prepare written testimony (which is filed before the hearing starts). (10 CFR 2.743 (b).)

2. A lengthy hearing phase

- a. The evidentiary hearing revolves around facts and expert opinions based on those facts--not abstract legal principles.

- b. The only facts which will count are the ones which clearly get into evidence. (Materials obtained during discovery, including depositions, are not in evidence, unless someone successfully puts them into evidence at the hearing, e.g., 10 CFR 2.740a(g)). There are different mechanical means of doing this, and an expert witness may be involved in all of them during a hearing:

- (1) Present prefiled written testimony (direct testimony; it can be in question and answer format)
- (2) Exhibits
- (3) Voir Dire (questions of experts regarding their qualifications)
- (4) Cross-examination (questions by lawyers for other participants)
- (5) Redirect (questions by your own lawyer)
- (6) Recross-examination
- (7) Board examination
- (8) Rebuttal testimony (by you or experts who disagree with you)

Oral testimony is recorded in a formal, typed transcript.

- c. Panels of witnesses for the same party are often put together to testify. This is a powerful way of presenting testimony, since all needed subject matter experts are on the stand together to give the best answer to each question (after conferring if necessary). There is also

the possibility that witnesses for different parties will be put together to testify on a particular point.

3. Lengthy post-hearing and Appeals phases.

a. Written Licensing Board decision(s).

b. Appeal Board review.

c. Commission review.

d. Federal Courts (Circuit Court of Appeals and U.S. Supreme Court).

e. Role of Expert Witnesses - Post Hearing

(1) Help attorneys correct serious errors in record and help prepare Proposed Findings of Fact and Conclusions of Law.

(2) Help attorneys prepare responses to motions to reopen, stay motions, appeal briefs (Appeal Board, Commission).

(3) Help attorneys prepare briefs for appeals in Federal Courts (U.S. Courts of Appeals, U.S. Supreme Court).

F. Relationship With Your Lawyers:

It is one of mutual dependence on each other's expertise. It is a continuous process of educating each other in order that you may both work as a team on:

1. Preparation of your testimony and your lawyer's cross-examination of other witness' testimony.

2. Your lawyer's ability to raise proper objections, often "on the spot," is dependent on how well you have taught your lawyer the technical facts involved.

G. Relationship with Board and Other Parties:

1. The Ex Parte Rule

- a. Preferably, do not talk privately with the Licensing Board, Appeal Board, Commissioners, or their personal staffs about anything substantive from now on.
- b. For sure, after a hearing has been "noticed" (formal acceptance for review by NRC of the construction authorization application), do not talk with them about anything which arguably could be related to your work or anyone else's work in the NNWSI Project.
- c. It is permissible to talk with the NRC Staff about your work, as distinguished from the personal staff advising Board Members or Commissioners.

(Videotape - Tape #1, 1 min. Hearing Board lecture re: ex parte, etc.)

2. At the hearing be your usual pleasant, courteous and serious self. (If that's not you, do not be yourself.)

H. The Contents of Written Direct Testimony

1. The direct testimony of an expert witness consists of four parts: (1) his qualifications as an expert, (2) the data from which he fashions his opinion, (3) the reasoning by which he progresses from the data to his conclusion or opinion, and (4) the conclusion or opinion itself.
2. In the ordinary course of events the qualifications of an expert are demonstrated by: (1) his practical experience in fields related to his expertise, (2) his education, (3) his

acceptance as an expert on the subject by other tribunals before which he has testified, (4) his membership in professional societies, (5) his authorship of papers or books on the subject of his expertise, and (6) honors or other recognitions by colleagues or by the public. Of course, all of these indicia of qualifications may not exist in a particular expert; a graduate engineer may later become an expert in some other field, or an expert may never have testified before. Generally speaking, the more qualified an individual is with respect to those categories, the more weight will be given his expert conclusions. It should also be noted that in combination with these "paper" qualifications, the cogency of the substantive analysis presented by the witness is a prime factor in demonstrating his expertise.

3. In sum, regardless of whether evidence is first hand, or based on reports of others ("hearsay")*, the "weight" a judge will give your evidence depends on:

- a. Supporting bases
- b. Your expertise
- c. Your credibility
- d. Internal logic and consistency
- e. Verification by objective tests
- f. Corroboration by other experts

"Only relevant, material, and reliable evidence which is not unduly repetitious will be admitted" (10 CFR 2.743 (c))

*Note: Use of hearsay evidence may be of great significance in long-term projects since it permits subject matter experts to adopt the work of others (who may no longer be with the Project) and defend it at hearings as their own. That also highlights the importance of good QA in documenting data and decisions that may be critical at hearings many years later.

4. In formal legal procedure, the witness is sworn in and the professional qualifications statement is moved into evidence ahead of the substantive testimony. At that point, a process known as "voir dire", i.e. "to speak the truth", may take place. This is where the witness is questioned on his qualifications as an expert by the parties or the Board. Proposed expert testimony may be disallowed where the voir dire shows the witness lacks the requisite expert qualifications. In the alternative, the results of the voir dire may strongly affect the relative weight which a Board gives to contradictory testimony by different witnesses.
5. In common, but somewhat more informal practice, the qualifications statement is admitted into evidence at the same time as the rest of the testimony. However, the admission is subject to a motion to strike (remove) the testimony from evidence on the grounds that the cross-examination shows that the witness lacks the requisite expert qualifications. Under this less formal procedure, the cross-examiner may normally ask his voir dire type questions as part of his overall questioning.
6. The mechanics of moving prepared written testimony into evidence is generally as follows (with minor variations where there are multiple documents, several witnesses sponsoring the same document, or referenced exhibits): Your attorney identifies the documents by heading and number of pages and asks if you have a copy before you. You are then asked:

Question: Was this document prepared by you or under your supervision?

Question: Do you have any corrections, clarifications, or updates (as the case may be) to this document? (Make sure you have told your attorney well in advance of the day you take the stand if you have made any changes).

Question: As corrected, is this document true and correct to the best of your knowledge?

Question: Do you adopt this document as your testimony in this proceeding?

Your attorney will then request the Board to admit your testimony into evidence and bind it into the transcript as if read.

7. It is not uncommon for your attorney to then ask you to briefly summarize your testimony orally for the benefit of the members of the public and the press who may be present. You will have been asked to prepare this brief summary in advance.
8. Remember, the Board will not be interested or impressed by mere conclusory opinions in your testimony. They are interested in the supporting material you use, and will be impressed by the reasoning you follow. You must expressly set forth the detailed bases in your testimony to support your reasoning and the conclusions drawn from that reasoning.

I. Probable Order of Presentation of Testimony at Hearing (for each issue being litigated) ("Issue by Issue Trial")

- a. Applicant (DOE)
- b. Intervenors
- c. States and Tribes
- d. NRC Staff

The order may depend on the substantive position of the party on the particular issue. The only sure thing is that the Applicant (DOE) will testify first.

J. The "Burden of Proof" is with and stays with, the Applicant (DOE).

K. There are sanctions for falsehoods and defaults, as follows

1. Perjury: criminal sanction for lying under oath. (e.g., 10 CFR 50.110)
2. Material false statement: action by NRC and/or Department of Justice; possibility of a fine and even rejection of application.
3. Dismissal of party by Board for discovery failures or other failures to comply with Board orders. (10 CFR 2.707).
4. Dismissal of representative of Party for failure to comply with Board orders. (10 CFR 2.713(c)).
5. Rejection of all or part of proffered testimony for lack of professional qualifications or relevance to admitted contention. (10 CFR 2.743)

L. Bear in mind that your work, both written and oral, also could be used in other forums, including environmental scoping hearings held by DOE, and prudence of expenditure inquiries and hearings held by State public utility rate setting commissions. These prudence hearings could focus on the prudence of costs being paid by electric utilities for the NNWSI project. Such hearings are becoming common for nuclear power plants.

M. Presenting Testimony at the Hearing - The Do's and Don't's

1. Introduction

We thought it might be helpful to give you some practical "tips" on things you should know and traps you should watch

out for while you are actually answering questions at the hearing. These "Do's and Don't's" will not make you a good witness. The best testimony technique in the world will not, at an NRC hearing, camouflage the fact that a witness is not really expert in the subject, or did not perform a thorough well-reasoned analysis, or did not prepare the written direct testimony so as to thoroughly and verifiably demonstrate the data and reasoning process which support the expert opinions of the witness. But, assuming you have done your job well in preparing your substantive work and written direct testimony, there are still certain practical hearing dynamics which you need to be aware of. Otherwise, your oral answers could be poorly presented and thereby get in the way of the good substantive quality of your written and oral testimony.

The "Do's and Don't's" are important because failure to observe them could lead you into digressive situations where you will feel awkward and unnecessarily stressful, thereby distracting you from concentrating on the substance of your testimony. Also, as you will see in going through the Do's and Don't's, witnesses who do not keep these guideposts in mind can detract from their own testimony, and unnecessarily cause the participants and judges to give less weight to that testimony.

By the way, witnesses who have done an inadequate job in their substantive preparation are the same witnesses who tend to violate the practical guidance of the Do's and Don't's when testifying at the hearing. After going through the Do's and Don't's which follow, you can probably deduce why this is true. Lawyers and judges know this, so when a witness begins to exhibit more and more "Don't" behavior, this becomes an additional reason to step up the pressure of more intense cross-examination and thereby develop additional "ammunition" on the transcript to discredit such a witness.

2. The Do's and Don'ts

TELL THE TRUTH

Do: Tell the truth, the whole truth, so help you--you're under oath! Be courteous and respectful of the parties, Board and proceedings.

Don't: Lie under oath, or testify on subjects outside your area of expertise! Sanctions could hurt, and a sharp cross-examiner could impeach you as a witness.

ENGAGE BRAIN BEFORE PUTTING MOUTH IN GEAR

DO: Take time to compose your answer - it also gives your attorney an opportunity to object to questions that are improper (i.e., misleading, irrelevant, or outside the scope of the admitted contention). Remember, testifying successfully is a team effort.

Don't: Shoot from the lip or attempt to stall or stonewall a party or the Board; such behavior can damage your credibility and reduce the weight of your testimony.

WHAT'D HE SAY?

Do: Give loud, clear answers so all in attendance (including the court reporter) can hear you.

Don't: Mumble, or nod your head in answer to a question.

NOTE: Don't say don't (or orally use other contractions), where the listeners, including the court reporter, can confuse a positive with a negative answer.

ANSWER THE QUESTION (IF YOU CAN)

Do: Make sure you understand and answer the question asked - if you don't understand it say so (you may also ask to have the court reporter read the question back to you).

Don't: Answer the question you want asked. Answer the question which was asked if you can.

TRUTH MEANS SOMETIMES HAVING TO SAY "I DO NOT KNOW"

Do: If you do not know the answer, say so.

Don't: Try to fake it, give "cute" or gratuitous answers, or argue with the cross-examiner. The hearing process is serious business and merits your respect.

LOOK IT UP! (IT'S O.K.)

Do: Refer to any notes, reports, or data if necessary before answering a question. Remember, hearsay is admissible evidence if you are qualified as an expert to testify on the subject. You must bring all references (at least excerpts) relied on in your testimony with you, since the references are subject to reviews by other parties.

Don't: Use more references than you need to establish your point. This can sidetrack you from your own analysis. Unnecessary references are a burden to carry on travel, and can increase the length and depth of cross-examination without adding useful information.

YOU TESTIFY! LAWYERS ARGUE

Do: Calmly assert your right to complete your answer if the cross-examiner interrupts you - your attorney will help you

if he's aware you have not been allowed to complete your answer.

Don't: Argue with the cross-examiner (leave that for your attorney) or become emotional.

SCIENTIFIC INQUIRY: IF THE IMPORTANT PART OF YOUR ANSWER IS SURROUNDED BY UNNECESSARY VERBIAGE, AND NO ONE IS LEFT AWAKE TO HEAR IT, HAVE YOU SAID ANYTHING?

Do: Answer each question as concisely as possible without omitting important information. Simple yes or no answers may be followed by explanatory testimony that sets out assumptions and conditions critical to your answer.

Don't: Lecture the Board and parties or go beyond the need to fully and accurately answer the question; avoid jargon.

LISTEN UP!

Do: Listen carefully to all objections made by your attorney; he may be trying to keep you out of a trap, or prevent attempts to go outside the scope of the issues of controversy.

Don't: Answer any questions after an objection until the Board rules on the objection or directs you to answer.

JACK OF ALL TRADES AND ...

Do: If you are a member of a panel of expert witnesses, or if you know of another expert scheduled to testify who is better able to answer a question, you may defer the question to the appropriate witness, or inform the Board and parties of the scheduled testimony of the expert who is better qualified to answer the question.

Don't: Attempt to answer questions that are outside your area of expertise; it's generally unproductive and may damage the credibility of your testimony in areas in which you are expert.

NOBODY'S PERFECT

Do: Ask permission to correct an inadvertent, incorrect or misleading answer while on the stand. If you are off the stand before you realize your error, inform your attorney immediately; it may be possible to have you return to the stand to correct the error. If you are unsure about how to correct your answer, wait until the next break and discuss it with your attorney (corrections can also be made on redirect).

Don't: Ask permission to confer with your attorney or anyone not on a panel with you while responding to questions.

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PDR ☒

*LPDR ☒ (N)

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