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TO: King Stablein
FROM: Paul T. Prestholt, Sr. OR - NNWSI
DATE: August 8, 1986
SUBJECT: DOE QA AUDIT SCHEDULE FOR FY 86 and
LAWRENCE LIVERMORE NATIONAL LABORATORY WASTE PACKAGE TASK
PUBLICATION LIST, APRIL 1986

Please find enclosed the above-referenced information.

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JUL 31 1986

Those on Attached List

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS (NNWSI) PROJECT FY 1986 AUDIT SCHEDULE

The latest revision of the audit schedule of proposed Waste Management Project Office (WMP0) audits for FY 1986 is enclosed for guidance to the participating organizations and support contractors.

This change to the audit schedule is due to the WMP0 stop work orders issued to the participating organizations on June 9 and 10, 1986.

Please review the enclosed schedule and provide WMP0 with any comments. Questions concerning the latest audit schedule should be brought to the attention of James Blaylock, Project Quality Manager, (FTS 575-1125) for resolution.

A handwritten signature in black ink, reading "Donald L. Vieth", is positioned above the typed name.

Donald L. Vieth, Director
Waste Management Project Office

WMP0:JB-1722

Enclosure:
As stated

QA AUDIT SCHEDULE FOR FY 86

AUDIT NO.	TARGET DATE	ORGANIZATION	ACTIVITIES	REQUIREMENTS
86-1	February - WK of 3rd	LLNL	NNWSI Project Activity	NVO-196-17 (Rev. 3) and Implementing QA Procedures
86-2	March - WK of 10th Postponed Until Further Notice	a-USGS/Denver b-USGS/Menlo Park	NNWSI Project Activity NNWSI Project Activity	NVO-196-17 (Rev. 3) and Implementing QA Procedures
86-3	April - WK of 14	REECo	NNWSI Project Activity	NVO-196-17 (Rev. 3) and Implementing QA Procedures
86-4	June - WK of 16th	F&S	NNWSI Project Activity	NVO-196-17 (Rev. 3) and Implementing QA Procedures
86-5	Postponed Until Further Notice	Los Alamos	NNWSI Project Activity	NVO-196-17 (Rev. 4) and Implementing QA Procedures
86-6	Postponed Until Further Notice	WMPO/NV :		NVO-196-18 (Rev. 2) and Implementing QMPs
86-7	Postponed Until Further Notice	H&N	NNWSI Project Activity	NVO-196-17 (Rev. 4) and Implementing QA Procedures

AUDIT NO.	TARGET DATE	ORGANIZATION	ACTIVITIES	REQUIREMENTS
86-8	Postponed Until Further Notice	SNL	NNWSI Project Activity	NVO-196-17 (Rev. 4) and Implementing QA Procedures
86-9	Postponed Until Further Notice	SAIC/T&MSS	NNWSI Project Activity	NVO-196-17 (Rev. 4) and Implementing QA Procedures

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LAWRENCE LIVERMORE NATIONAL LABORATORY
WASTE PACKAGE TASK
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1 APRIL 1986

- 1 "Leach Testing of Waste Forms--Interrelationship of ISO and MCC Type Tests," V. M. Oversby, published in "Workshop on Leaching Mechanisms of Nuclear Waste Forms, May 19-21, 1982", PNL-4382, pp 97-129, (also available as Lawrence Livermore National Laboratory Report UCRL 87621, May 1982).
- 2 "Nuclear Waste Package Program for High-Level Isolation in Nevada Tuff," A. J. Rothman, presented at the American Nuclear Society Annual Meeting, Los Angeles, June 6-11, 1982, (also available as Lawrence Livermore National Laboratory Report UCRL 87091, June 1982).
- 3 "Development of Waste Packages for Tuff," A. J. Rothman, submitted for NWTs Program Information Meeting, Las Vegas, December 14-16, 1982, (also available as Lawrence Livermore National Laboratory Report UCRL 88175).
- 4 "Design of a Nuclear Waste Package for Emplacement in Tuff," W. C. O'Neal, A. J. Rothman, D. W. Gregg, J. N. Hockman, M. A. Revelli, E. W. Russell, and J. R. Schornhorst, for ANS/ASME Waste Management '83, Tucson, AZ, (also available as Lawrence Livermore National Laboratory Report UCRL 88192), February 1983.
- 5 "Handling Encapsulated Spent Fuel in a Geological Repository Environment," L. B. Ballou, presented at IAEA International Conference Radioactive Waste Management, Seattle, WA, May 15-20, 1983 (also available as Lawrence Livermore National Laboratory Report UCRL 87872).
- 6 "Petrologic and Geochemical Characterization of the Bullfrog Member of the Crater Flat Tuff: Outcrop Samples Used in Waste Package Experiments," K. G. Knauss, UCRL 53470, September 1983.
- 7 "Reaction of Bullfrog Tuff with J-13 Well Water at 90°C and 150°C," V. M. Oversby and K. G. Knauss, UCRL 53442, September 1983.
- 8 "Initial Specifications for Nuclear Waste Package External Dimensions and Materials," D. W. Gregg and W. C. O'Neal, UCID 19926, September 1983.
- 9 "Containment Barrier Metals for High-Level Waste Packages in a Tuff Repository," E. W. Russell, R. D. McCright, and W. C. O'Neal, UCRL 53449, October 1983.

- 10 "Uncertainty Analysis: An Illustration from Nuclear Waste Package Development," W. G. Sutcliffe, for publication in Journal of Nuclear and Chemical Waste Management, (also available as Lawrence Livermore National Laboratory Report UCRL 90042, October 1983).
- 11 "Canister Materials for a Nuclear Waste Package in a Tuff Repository," R. D. McCright and L. B. Ballou, for the October 1983 American Nuclear Society Meeting in San Francisco, CA (also available as Lawrence Livermore National Laboratory Report UCRL 89467).
- 12 "Corrosion Test Plan to Guide Canister Material Selection and Design for a Tuff Repository," R. D. McCright, R. A. Van Konynenburg, and L. B. Ballou, for Materials Research Society Symposium, Boston, MA, November 1983 (also available as Lawrence Livermore National Laboratory Report UCRL 89476).
- 13 "Post Emplacement Environment of Waste Packages," K. G. Knauss, V. M. Oversby, and T. J. Wolery, for Materials Research Society Symposium, Boston, MA, November 1983 (also available as Lawrence Livermore National Laboratory Report UCRL 89475).
- 14 "Selection of Barrier Metals for A Waste Package in Tuff," E. W. Russell, R. D. McCright, and W. C. O'Neal, for Materials Research Society Symposium, Boston, MA, November 1983 (also available as Lawrence Livermore National Laboratory Report UCRL 89404, Rev. 1).
- 15 "The NNWSI Waste Form Testing Program," V. M. Oversby, for Materials Research Society Symposium, Boston, MA, November 1983 (also available as Lawrence Livermore National Laboratory Report UCRL 89477).
- 16 "Nuclear Criticality Safety Analysis of a Spent Fuel Waste Package in a Tuff Repository," B. H. Weren, M. A. Capo, and W. C. O'Neal, December 1983. Submitted to Lawrence Livermore National Laboratory by Westinghouse Electric, Pittsburgh, PA, December 1983, Contractor Report UCRL 15575.
- 17 "Performance Testing of Waste Forms in a Tuff Environment," V. M. Oversby, for Civilian Radioactive Waste Management Information Meeting, Washington, D. C., December 1983 (also available as Lawrence Livermore National Laboratory Report UCRL 90045).
- 18 "Waste Package for a Repository Located in Tuff," L. B. Ballou, for Civilian Radioactive Waste Management Information Meeting, Washington, D. C., December 1983 (also available as Lawrence Livermore National Laboratory Report UCRL 90044).
- 19 "Reference Waste Forms and Packing Material for the Nevada Nuclear Waste Storage Investigations Project," V. M. Oversby, UCRL 53531, March 1984.

- 20 "Nuclear Waste Package Design for the Vadose Zone in Tuff," W. C. O'Neal, L. Ballou, D. Gregg, J. Hockman, E. Russell, J. Schornhorst, and B. Weren, for ANS/ASME Waste Management '84, Tucson, AZ, March 1984 (also available as Lawrence Livermore National Laboratory Report UCRL 89830).
- 21 "Spent Fuel Cladding Containment Credit Tests," C. N. Wilson and V. M. Oversby, for Waste Management '84 Conference, March 1984 (also available as Lawrence Livermore National Laboratory Report UCRL 89869).
- 22 "Thermal Modeling of Nuclear Waste Package Designs for Disposal in Tuff," J. N. Hockman and W. C. O'Neal, for ANS/ASME Waste Management '84, Tucson, AZ, March 1984 (also available as Lawrence Livermore National Laboratory Report UCRL 89820 Rev. 1).
- 23 "Selection of Candidate Canister Materials for High-Level Nuclear Waste Containment in a Tuff Repository," R. D. McCright, H. Weiss, M. C. Juhas, and R. W. Logan, for National Association of Corrosion Engineers' Meeting, New Orleans, LA, April 1984 (also available as Lawrence Livermore National Laboratory Report UCRL 89988).
- 24 "Thermal Analysis of NNWSI Conceptual Waste Package Designs," W. Stein, J. N. Hockman, and W. C. O'Neal, UCID 20091, April 1984.
- 25 "Reaction of the Topopah Spring Tuff with J-13 Well Water at 90°C and 150°C," V. M. Oversby, UCRL 53552, May 1984.
- 26 "Hydrothermal Interaction of Topopah Spring Tuff w/J-13 Water as a Function of Temperature," K. Knauss, J. Delany, J. Beiriger, and D. Peifer, Proceedings of the Materials Research Society Meeting, Boston, MA, pp 539-546, November 1984, (also available as Lawrence Livermore National Laboratory Report UCRL 90853, May 1984).
- 27 "An Overview of Low-Temperature Sensitization," M. J. Fox and R. D. McCright, June 1984, Submitted to Lawrence Livermore National Laboratory by M. J. Fox, Consultant, Cupertino, CA, Contractor Report UCRL 15619.
- 28 "Petrologic & Geochemical Characterization of the Topopah Spring Member of the Paintbrush Tuff: Outcrop Samples Used in Waste Package Experiments," K. G. Knauss, UCRL 53558, June 1984.
- 29 "Electrochemical Determination of the Corrosion Behavior of Candidate Alloys Proposed for Containment of High Level Nuclear Waste in Tuff," R. S. Glass, G. E. Overturf, R. E. Garrison, and R. D. McCright, UCID 20174, June 1984.
- 30 "Reaction of the Topopah Spring Tuff with J-13 Water at 120°C," V. Oversby, Report UCRL 53574, July 1984.

- 31 "Parametric Testing of a DWPB Borosilicate Glass," F. Bazan and J. Rego, Proceedings of the Materials Research Society Meeting, Vol. 44, pp. 303-310, Boston, MA, November 1984, (also available as Lawrence Livermore National Laboratory Report UCRL 90857, July 1984).
- 32 "Report on Static Hydrothermal Alteration Studies of Topopah Spring Tuff Core Wafers in J-13 Water at 150°C," K. G. Knauss and J. Beiriger, UCRL 53576, August 1984.
- 33 "NNWSI Interim Acceptance Specifications for Defense Waste Processing Facility and West Valley Demonstration Project Waste Forms and Canisterized Waste," V. M. Oversby, UCID 20165, August 1984.
- 34 "Potential Corrosion and Degradation Mechanisms of Zircaloy Cladding on Spent Nuclear Fuel in a Tuff Repository," A. Rothman, UCID 20172, September 1984.
- 35 "Transport Properties of Topopah Spring Tuff," W. Lin and W. Daily, UCRL 53602, October 1984.
- 36 "Corrosion Behavior of Carbon Steels Under Tuff Repository Environmental Conditions," R. D. McCright and H. Weiss, Proceedings of the Materials Research Society Meeting, Vol. 44, pp. 287-294, Boston, MA, November 1984, (also available as Lawrence Livermore National Laboratory Report UCRL 90875, October 1984).
- 37 "Leaching Savannah River Plant Nuclear Waste Glass in a Saturated Tuff Environment," N. Bibler, G. Wicks, and V. Oversby, Proceedings of the Materials Research Society Meeting, Vol. 44, pp 247-256, Boston, MA, November 1984, (also available as Lawrence Livermore National Laboratory Report UCRL 91258, November 1984).
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- 40 "Behavior of Carbon-14 in Waste Packages for Spent Fuel in a Repository in Tuff," R. A. Van Konynenburg, C. F. Smith, H. W. Culham, and C. H. Otto, Proceedings of the Materials Research Society Meeting, Vol. 44, pp 405-412, Boston, Massachusetts, November 1984, (also available as Lawrence Livermore National Laboratory Report UCRL 90855, Rev. 1, November 1984).

- 41 "Laboratory Experiments Designed to Provide Limits on the Radionuclide Source Term for the NNWSI Project," V. M. Oversby and R. D. McCright, Proceedings of Workshop on the Source Term for Radionuclide Migration from HLW or Spent Nuclear Fuel, Albuquerque, NM, November 13-15, 1984, (also available as Lawrence Livermore National Laboratory Report UCRL 91257, November 1984).
- 42 "Pre-Closure Analysis of Conceptual Waste Package Designs for a Nuclear Waste Repository in Tuff," W. O'Neal, D. Gregg, J. Hockman, E. Russell and W. Stein, UCRL 53595, November 1984.
- 43 "Dachiardite Formation by Hydrothermal Alteration of a Devitrified High-Silica Rhyolite," K. Knauss and J. Beiriger, submitted to Am. Mineral, (also available as Lawrence Livermore National Laboratory Report UCRL 90872, November 1984).
- 44 "Preliminary Evaluation of Alterant Geophysical Tomography in Welded Tuff," A. Ramirez and W. Daily, UCID 20289, December 1984.
- 45 "Hydrothermal Interaction Studies of Bullfrog Member Tuff Core Wafers in J-13 Water at 150°C Quantitative Analyses of Aqueous and Solid Phases," K. G. Knauss, UCRL 53521, 1984.
- 46 "Gamma Radiation Effects on Corrosion: I Electrochemical Mechanisms for the Aqueous Corrosion Processes of Austenitic Stainless Steels," R. S. Glass, G. E. Overturf III, R. A. Van Konynenburg, and R. D. McCright, submitted to Corrosion Science, (also available as Lawrence Livermore National Laboratory Report UCRL 92311, February 1985).
- 47 "Preliminary Evaluation of Alterant Geotomography in Welded Tuff," A. Ramirez and W. Daily, Proceedings of the U.S. Symposium on Rock Mechanics, Rapid City, SD, June 26-28, 1985, (also available as Lawrence Livermore National Laboratory Report UCRL 92229, February 1985).
- 48 "Radionuclide Release From PWR Fuels in J-13 Well Water," V. Oversby and C. Wilson, Proceedings of the Waste Management 85 Meeting, Vol. 1, pp. 497-503, Tucson, AZ, March 25-29, 1985, (also available as Lawrence Livermore National Laboratory Report UCRL 91464, March 1985).
- 49 "Corrosion Performance of Metals and Alloys in a Tuff Geochemical Environment," R. A. Van Konynenburg and R. D. McCright, Proceedings of the Waste Management '85 Meeting, Vol. 1, pp. 453-457; Tucson, AZ, March 25-29, 1985, (also available as Lawrence Livermore National Laboratory Report UCRL 91740, March 1985).
- 50 "Parametric Testing of a DWP Glass," F. Bazan and J. Rego, UCRL 53606, March 1985.
- 51 "The Reaction of Topopah Spring Tuff with J-13 Water at 150°C - Samples USW G-4, and UE-25h#1," V. M. Oversby, UCRL 53629, March 1985.

- 52 "Permeability and Fluid Chemistry Studies of the Topopah Spring Member of the Paintbrush Tuff, Nevada Test Site: Part II," D. E. Moore, C. A. Morrow, and J. D. Byerlee, Contractor Report UCRL 15667, March 1985.
- 53 "NNWSI Waste Form Test Method for Unsaturated Disposal Conditions," J. Bates and T. Gerding, Proceedings of the Waste Management 85 Meeting, Vol. 1, pp. 459-465, Tucson, AZ, March 25-29, 1985, Contractor Report UCRL 15723, March 1985.
- 54 "Metallurgical Analysis of a 304L Stainless Steel Canister from the Spent Fuel Test-Climax," H. Weiss, R. A. Van Konynenburg, and R. D. McCright, UCID 20436, April 1985.
- 55 "Field Investigation of Keyblock Stability," J. L. Yow, Jr., UCRL 53632, April 1985.
- 56 "Concept for Waste Package Environment Tests in the Yucca Mountain Exploratory Shaft," J. L. Yow, Jr., UCID 20450, May 1985.
- 57 "Hydrothermal Interaction of Crushed Topopah Spring Tuff and J-13 Water at 90°C, 150°C, and 250°C Using Dickson-Type Gold Bag Rocking Autoclaves," K. Knauss, J. Beiriger, and D. Pelfer, UCRL 53630, May 1985.
- 58 "Spent Fuel Cladding Corrosion Under Tuff Repository Conditions - Initial Observations," H. D. Smith and V. M. Oversby, UCID 20499, June 1985.
- 59 "LWR Spent Fuel Characteristics Relevant to Performance as a Wasteform in a Potential Tuff Repository," C. N. Wilson, R. E. Einziger, R. E. Woodley, and V. M. Oversby, submitted to American Nuclear Society Winter Meeting, November 10-14, 1985, San Francisco, CA, (also available as Lawrence Livermore National Laboratory Report UCRL 92891, June 1985).
- 60 "Blind Zones in Acquisition of Discontinuity Orientation Data," J. L. Yow, Jr., submitted to International Journal of Rock Mechanics and Mining Sciences, (also available as Lawrence Livermore National Laboratory Report UCRL 89960, July 1985).
- 61 "FY85 Status Report on Feasibility Assessment of Copper-Base Waste Package Container Materials in a Tuff Repository," R. D. McCright, UCID 20509, September 1985.
- 62 "Water Transport in Topopah Spring Tuff--Implications for a Nuclear Waste Repository in Tuff," W. Lin and W. Daily, submitted to SCIENCE, (also available as Lawrence Livermore National Laboratory Report UCRL 93382, September 1985).

- 63 "Corrosion Processes of Austenitic Stainless Steels and Copper-Based Materials in Gamma-Irradiated Aqueous Environments," R. Glass, R. Van Konynenburg, and G. Overturf, submitted to Corrosion 86, March 17-21, 1986, Houston, TX, (also available as Lawrence Livermore National Laboratory Report UCRL 92941, September 1985).
- 64 "Derivation of a Waste Package Source Term for NNWSI from the Results of Laboratory Experiments," V. M. Oversby and C. N. Wilson; Materials Research Society 1985 Symposium on the Scientific Basis for Nuclear Waste Management, Stockholm, Sweden, (also available as Lawrence Livermore National Laboratory Report UCRL 92096, September 1985).
- 65 "A Ground Reaction Curve Based upon Block Theory," J. L. Yow, Jr. and R. E. Goodman, submitted to Rock Mechanics and Rock Engineering (also available as Lawrence Livermore National Laboratory Report UCRL 93431, October 1985).

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- OA-1 "Chapter V, Reaction of Glass with Water," in Fuel Cycle Programs Quarterly Progress Report April - June 1983, J. K. Bates, T. J. Gerding, and P. L. McDaniel, ANL-83-78, pp 67-81, 1983.
- OA-2 Chapter V, Reaction of Glass with Water," in Fuel Cycle Programs Quarterly Progress Report July - September 1983, J. K. Bates, T. J. Gerding, P. L. McDaniel, and R. A. Wigeland, ANL-83-88, pp 69-80, 1983.
- OA-3 "The Characteristics of Spent LWR Fuel Relevant to its Storage in Geologic Repositories," R. E. Woodley, HEDL TME 83-28, October 1983.
- OA-4 "Test Plan for Spent Fuel Cladding Containment Credit Tests," C. N. Wilson, HEDL TC-2353-2, November 1983.
- OA-5 "Permeability and Pore-Fluid Chemistry of the Topopah Spring Tuff, Nevada Test Site, in a Temperature Gradient," C. A. Morrow, D. E. Moore, and J. D. Byerlee, for Materials Research Society Symposium, Boston, MA, November 1983.
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- OA-9 "Permeability and Pore-Fluid Chemistry of the Bullfrog Tuff in a Temperature Gradient," C. Morrow, D. Moore, and J. Byerlee, Proceedings 24th Symposium on Rock Mechanics, pp 819-828, 1983.
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- OA-12 "Effects of Tuff Waste Package Components on Release From 76-68 Simulated Waste Glass," G. L. McVay and G. R. Robinson, PNL-4897, August 1984.
- OA-13 "Test Plan for Series 2 Spent Fuel Cladding Containment Credit Tests," C. N. Wilson, HEDL-TC-2353-3, October 1984.
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- OA-15 "NNWSI Waste Form Performance Test Development," J. K. Bates and T. J. Gerding, Proceedings of the Materials Research Society Meeting, Vol. 44, pp 295-302, Boston, MA, November 1984.
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- OA-17 "Changes in Permeability and Fluid Chemistry of the Topopah Spring Member of the Paintbrush Tuff (Nevada Test Site) When Held in a Temperature Gradient," D. E. Moore, C. A. Morrow and J. D. Byerlee, U.S. Geological Survey Open-File Report 84-273, 1984 (also available as Lawrence Livermore National Laboratory Report UCRL 15620).
- OA-18 "NNWSI Phase II Materials Interaction Test Procedure and Preliminary Results," J. K. Bates and T. J. Gerding, ANL 84-81, January 1985.
- OA-19 "High Temperature Permeability of Some Nevada Test Site Tuffs," D. Moore, C. Morrow, and J. Byerlee, USGS, for submittal to Journal of Geophysical Research, February 1985.
- OA-20 "Low Temperature Spent Fuel Oxidation Under Tuff Repository Conditions," R. Einziger and R. Woodley, Proceedings of the Waste Management 85 Meeting, Vol. 1, pp. 505-512, Tucson, AZ, March 25-29, 1985.
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- OA-23 "Technical Test Description of Activities to Determine the Potential for Spent Fuel Oxidation in a Tuff Repository," R. Einziger, HEDL-7540, June 1985.

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- OA-26 "Microstructural Characteristics of PWR Spent Fuel Relative to Its Leaching Behavior," C. N. Wilson, for presentation at American Ceramic Society 87th Annual Meeting, Cincinnati, OH, May 5-9, 1985, HEDL-SA-3313, November 1985.
- OA-27 "One Year Results of the NNWSI Unsaturated Test Procedure: SRL 165 Glass Application," J. Bates and T. Gerding, ANL-85-41, November 1985.

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"Structural Analysis of Conceptual Waste Package Designs for a Tuff Repository," E. W. Russell and W. C. O'Neal.

"Economic Analysis of Conceptual Waste Package Designs for the Tuff Repository," D. W. Gregg and W. C. O'Neal.

"Report on the System Model for Waste Package Performance Analysis," M. A. Revelli.

"Corrosion Performance of Austenitic Stainless Steels for NNWSI Conceptual Waste Package Designs," C. Acton and R. D. McCright

"Test Plan for Series 3 NNWSI Spent Fuel Leaching Dissolution Tests," C. N. Wilson, HEDL-7577.

Zircaloy Spent Fuel Cladding Electrochemical Corrosion Experiment at 170°C and ~120 PSIA H₂O," H. Smith, HEDL-7545.

"Geochemical Gradients in the Topopah Spring Member of the Paintbrush Tuff: Evidence for Eruption Across a Magmatic Interface," B. C. Schuraytz.

"Evaluation of Alterant Geophysical Tomography in Welded tuff," A. Ramirez and W. Daily.

"Hydrothermal Interaction of Solid Wafers of Topopah Spring Tuff with J-13 Water and Distilled Water at 90°, 150°, and 250°C Using Dickson-Type, Gold-Bag Rocking Autoclaves," K. Knauss, W. Beiriger, D. Peifer, and A. Piwinski, UCRL 53645.

"Important Radionuclides in High Level Nuclear Waste Disposal: Determination Using a Comparison of the EPA and NRC Regulations," V. M. Oversby.

"A Monte Carlo Investigation of a Proposed Screen for NX Borehole Jack Data," M. C. Axelrod, S. P. Verrill, W. C. Patrick, and J. L. Yow, Jr.

"Analysis and Observation of Keyblock Occurrence in Tunnels in Granite," J. L. Yow, Jr.

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