

BIBLIOGRAPHY OF  
RADIOACTIVE WASTE MANAGEMENT  
PUBLICATIONS AT  
LAWRENCE LIVERMORE NATIONAL LABORATORY  
(MAY 1982 through JUNE 1990)

YUCCA MOUNTAIN PROJECT (YMP)  
FORMALLY  
NEVADA NUCLEAR WASTE STORAGE INVESTIGATION (NNWSI)

JULY 1990

9008200088 900815  
PDR WASTE PDC  
WM-11

**Copies of UCRL-50,000 Series and UCID reports published by  
Lawrence Livermore National Laboratory are available at nominal  
cost from:**

**National Technical Information Services  
U.S. Department of Commerce  
5385 Port Royal Road,  
Springfield, Virginia 22161.**

**Inquires about the availability of other material should be addressed to:**

**D. Kiraly  
Lawrence Livermore National Laboratory  
Mail Stop L-204  
P.O. Box 808  
Livermore, California 94550**

YUCCA MOUNTAIN PROJECT  
PUBLICATION LISTING  
July 1990

- 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     Development of Waste Packages for Tuff, A. J. Rothman, Proceedings of the NWTs Program Information Meeting, Las Vegas, NV (December 14-16, 1982) DOE/NWTs-30, pp. 119-122, also available as Lawrence Livermore National Laboratory Report UCRL-88175, September 20, 1982.
- 3     Handling Encapsulated Spent Fuel in a Geologic Repository Environment, L. B. Ballou, Radioactive Waste Management, Vol. 3, IAEA-CN-43/223, International Atomic Energy Agency, Vienna (1984), pp. 463-472, also available as Lawrence Livermore National Laboratory Report UCRL-87872, February 1983.
- 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, Proceedings of the ANS/ASME Waste Management '83 Meeting in Tucson, AZ (February 27-March 3, 1983), Vol. 2, pp. 3-9, also available as Lawrence Livermore National Laboratory Report UCRL-88192, February 1983.
- 5     EQ3NR, A Computer Program for Geochemical Aqueous Speciation-Solubility Calculations: Users Guide and Documentation, T. Wolery, Lawrence Livermore National Laboratory Report UCRL-53414, April 1983.
- 6     Planning Exploratory Drilling: The Effect of Blind Zones and Level of Logging Effort, J. L. Yow, Jr. and D. G. Wilder, Proceedings of the 24th Symposium on Rock Mechanics at Texas A&M University (June 20, 1983), pp. 807-812, also available as Lawrence Livermore National Laboratory Report UCRL-88374, June 1983.
- 7     Reliability of Instrumentation in a Simulated Nuclear-Waste Repository Environment, W. C. Patrick and N. L. Rector, Proceedings of the International Symposium on Field Measurements in Geomechanics, Zurich, Switzerland (September 5-8, 1983), Ed. K. Kovari, pp. 1431-1440, also available as Lawrence Livermore National Laboratory Report UCRL-88806, June 1983.

- 8      Reaction of Bullfrog Tuff with J-13 Well Water at 90°C and 150°C, V. M. Oversby and K. G. Knauss, Lawrence Livermore National Laboratory Report UCRL-53442, September 15, 1983.
- 9      Initial Specifications for Nuclear Waste Package External Dimensions and Materials, D. W. Gregg and W. C. O'Neal, Lawrence Livermore National Laboratory Report UCID-19926, September 1983.
- 10     Petrologic and Geochemical Characterization of the Bullfrog Member of the Crater Flat Tuff: Outcrop Samples Used in Waste Package Experiments, K. G. Knauss, Lawrence Livermore National Laboratory Report UCRL-53470, September 1983.
- 11     Containment Barrier Metals for High-Level Waste Packages in a Tuff Repository, E. W. Russell, R. D. McCright, and W. C. O'Neal, Lawrence Livermore National Laboratory Report UCRL-53449, October 12, 1983.
- 12     Uncertainty Analysis: An Illustration from Nuclear Waste Package Development, William G. Sutcliffe, in Nuclear and Chemical Waste Management Journal, Vol. 5, pp. 131-140 (1984), also available as Lawrence Livermore National Laboratory Report UCRL-90042, October 1983.
- 13     Selection of Barrier Metals for a Waste Package in Tuff, E. W. Russell, R. D. McCright, and W. C. O'Neal, Proceedings of the Materials Research Society Meeting, Vol. 26, pp. 763-772 (1984), also available as Lawrence Livermore National Laboratory Report UCRL-89404, Rev. 1, October 1983.
- 14     Post Emplacement Environment of Waste Packages, K. G. Knauss, V. M. Oversby, and T. J. Wolery, Proceedings of the Materials Research Society Meeting, Symposium Proc. Vol. 26, pp. 301-308 (1984), also available as Lawrence Livermore National Laboratory Report UCRL-89475, November 1983.
- 15     The NNWSI Waste Form Test Program, V. M. Oversby, Proceedings of the Materials Research Society Meeting, Vol. 26, pp. 319-327 (1984), also available as Lawrence Livermore National Laboratory Report UCRL-89477, November 1983.
- 16     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, Proceedings of the Materials Research Society Meeting, Vol. 26, pp. 309-318 (1984), also available as Lawrence Livermore National Laboratory Report UCRL-89476, November 1983.

- 17      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, Corrosion/84 Conference, National Association of Corrosion Engineers, Houston, TX (April 1984), paper #198, also available as Lawrence Livermore National Laboratory Report UCRL-89988, November 1983.
- 18      Performance Testing of Waste Forms in a Tuff Environment, V. M. Oversby, Proceedings of the Civilian Radioactive Waste Management Information Meeting, Washington, DC (December 12-15, 1983), CONF. 831217, pp. 270-279, also available as Lawrence Livermore National Laboratory Report UCRL-90045, November 1983.
- 19      Waste Package for a Repository Located in Tuff, L. B. Ballou, Proceedings of the Civilian Radioactive Waste Management Information Meeting, Washington, DC (December 12-15, 1983), CONF. 831217, pp. 265-269, also available as Lawrence Livermore National Laboratory Report UCRL-90044, November 1983.
- 20      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, Westinghouse Electric Corporation, Waste Technology Services Division, Pittsburgh, PA, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-15575, December 1983.
- 21      An Overview of Low Temperature Sensitization, M. J. Fox and R. D. McCright, Lawrence Livermore National Laboratory Contractor Report UCRL-15619, December 1983.
- 22      Nuclear Waste Package Design for the Vadose Zone in Tuff, W. C. O'Neal, L. B. Ballou, D. W. Gregg, and E. W. Russell, Proceedings of the ANS/ASME Waste Management 84 Meeting, Tucson, AZ (March 11-15, 1984), Vol. 1, pp. 547-551, also available as Lawrence Livermore National Laboratory Report UCRL-89830, February 1984.
- 23      Thermal Modeling of Nuclear Waste Package Designs for Disposal in Tuff, J. N. Hockman and W. C. O'Neal, Proceedings of the ANS/ASME Waste Management 84 Meeting, Tucson, AZ (March 11-15, 1984), Vol. 1, pp. 441-448, also available as Lawrence Livermore National Laboratory Report UCRL-89820, Rev. 1, February 1984.
- 24      Spent Fuel Cladding Containment Credit Tests, C. N. Wilson and V. M. Oversby, Proceedings of the ANS/ASME Waste Management 84 Meeting, Tucson, AZ (March 11-15, 1984), Vol. 1, pp. 569-572, also available as Lawrence Livermore National Laboratory Report UCRL-89869, February 1984.

- 25     Hydrothermal Interaction Studies of Bullfrog Member Tuff Core Wafers in I-13 Water at 150°C Quantitative Analyses of Aqueous and Solid Phases, K. Knauss, Lawrence Livermore National Laboratory Report UCRL-53521, February 1984.
- 26     Reference Waste Forms and Packing Material for the Nevada Nuclear Waste Storage Investigations Project, V. M. Oversby, Lawrence Livermore National Laboratory Report UCRL-53531, April 1984.
- 27     EO3/6 Geochemical Modeling Task Plan for Nevada Nuclear Waste Storage Investigations (NNWSI), D. Isherwood and T. Wolery, Lawrence Livermore National Laboratory Report UCID-20069, April 1984.
- 28     Thermal Analysis of NNWSI Conceptual Waste Package Designs, W. Stein, J. Hockman, and W. O'Neal, Lawrence Livermore National Laboratory Report UCID-20091, April 1984.
- 29     Overview of Geochemical Modeling Needs for Nuclear Waste Management, D. Isherwood and T. Wolery, Proceedings of the Workshop on Fundamental Geochemistry Needs for Nuclear Waste Isolation, Los Alamos, NM, pp. 183-191 (June 20-22, 1984), also available as Lawrence Livermore National Laboratory Report UCRL-90846, May 1984.
- 30     Hydrothermal Interaction of Topopah Spring Tuff w/I-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, Vol. 44, pp. 539-546 (November 1984), also available as Lawrence Livermore National Laboratory Report UCRL-90853, May 1984.
- 31     Reaction of the Topopah Spring Tuff with I-13 Well Water at 90°C and 150°C, V. Oversby, Lawrence Livermore National Laboratory Report UCRL-53552, May 1984.
- 32     Petrologic & Geochemical Characterization of the Topopah Spring Member of the Paintbrush Tuff: Outcrop Samples Used in Waste Package Experiments, K. Knauss, Lawrence Livermore National Laboratory Report UCRL-53558, June 1984.
- 33     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, Lawrence Livermore National Laboratory Report UCID-20174, June 1984.

- 34     Reaction of the Topopah Spring Tuff with J-13 Water at 120°C, V. Oversby, Lawrence Livermore National Laboratory Report UCRL-53574, July 1984.
- 35     Report on Static Hydrothermal Alteration Studies of Topopah Spring Tuff Core Wafers in J-13 Water at 150°C, K. Knauss and J. Beiriger, Lawrence Livermore National Laboratory Report UCRL-53576, August 1984.
- 36     NNWSI Interim Acceptance Specifications for Defense Waste Processing Facility and West Valley Demonstration Project Waste Forms and Canisterized Waste, V. Oversby, Lawrence Livermore National Laboratory Report UCID-20165, August 1984.
- 37     Potential Corrosion and Degradation Mechanisms of Zircaloy Cladding on Spent Nuclear Fuel in a Tuff Repository, A. Rothman, Lawrence Livermore National Laboratory Report UCID-20172, September 1984.
- 38     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.
- 39     Transport Properties of Topopah Spring Tuff, W. Lin and W. Daily, Lawrence Livermore National Laboratory Report UCRL-53602, October 1984.
- 40     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, Lawrence Livermore National Laboratory Report UCRL-53595, November 1984.
- 41     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.
- 42     The Behavior of Actinide Containing Glasses During Gamma Irradiation in a Saturated Tuff Environment, J. Bates and V. Oversby, Proceedings of the Material Research Society Meeting, Vol. 44, pp. 257-264, Boston, MA (November 1984), also available as Lawrence Livermore National Laboratory Report UCRL-90818, November 1984.

- 43 Behavior of Stressed and Unstressed 304L Specimens in Tuff Repository Environmental Conditions, M. Juhas, D. McCright, and R. E. Garrison, Corrosion 85, Boston, MA (March 25-29, 1985), paper #117, also available as Lawrence Livermore National Laboratory Report UCRL-91804, November 1984.
- 44 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, MA (November 1984), also available as Lawrence Livermore National Laboratory Report UCRL-90855, Rev. 1, November 1984.
- 45 Laboratory Experiments Designed to Provide Limits on the Radionuclide Source Term for the NNWSI Project, V. M. Oversby and R. D. McCright, in the Proceedings of Workshop on the Source Term for Radionuclide Migration from HLW or Spent Nuclear Fuel, Albuquerque, NM (November 13-15, 1984), SAND85-0380, Hunter and Muller (Eds), pp. 175-186, also available as Lawrence Livermore National Laboratory Report UCRL-91257, November 1984.
- 46 Preliminary Evaluation of Alterant Geophysical Tomography in Welded Tuff, A. Ramirez and W. Daily, Lawrence Livermore National Laboratory Report UCID-20289, December 1984.
- 47 EO3/6: Status and Applications, T. J. Wolery, D. J. Isherwood, K.J. Jackson, J. M. Delany, and I. Puigdomenech, in Jacobs, G. K., and Whatley, S. K., eds., Proceedings of the Conference on the Application of Geochemical Models to High-Level Nuclear Waste Repository Assessment, Oak Ridge, TN, October 2-5, 1984, NUREG/CP-0062, ORNL/TM-9285, pp. 54-65 (1985), also available as Lawrence Livermore National Laboratory Report UCRL-91884, December 1984.
- 48 Fixed Fugacity Option for the EO6 Geochemical Reaction Path Code, J. Delany and T. Wolery, Lawrence Livermore National Laboratory Report UCRL-53598, December 1984.
- 49 Parametric Testing of a DWPF Borosilicate Glass, F. Bazan and J. Rego, Proceedings of the Materials Research Society Meeting, Vol. 44, pp. 303-310, Boston, MA (1984), also available as Lawrence Livermore National Laboratory Report UCRL-90857, January 1985.
- 50 Preliminary Evaluation of Alterant Geotomography in Welded Tuff, A. Ramirez and W. Daily, Proceedings of the 26th U.S. Symposium on Rock Mechanics, Rapid City, SD, pp. 807-816 (June 26-28, 1985), also available as Lawrence Livermore National Laboratory Report UCRL-92229, February 1985.



- 51     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, in Corrosion Science, Vol. 26, No. 8, pp. 577-590 (1986), also available as Lawrence Livermore National Laboratory Report UCRL-92311, February 1985.
- 52     Parametric Testing of a DWPF Glass, F. Bazan and J. Rego, Lawrence Livermore National Laboratory Report UCRL-53606, March 1985.
- 53     Radionuclide Release From PWR Fuels in a Reference Tuff Repository Groundwater, 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.
- 54     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.
- 55     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, Lawrence Livermore National Laboratory Contractor Report UCRL-15667, March 1985.
- 56     The Reaction of Topopah Spring Tuff with I-13 Water at 150°C - Samples From Drill Cores USWG-1, USWGU-3, USW G-4, and UE-25h#1, V. Oversby, Lawrence Livermore National Laboratory Report UCRL-53629, March 1985.
- 57     Improvements in the Solid Solution Modeling Capabilities of the EQ3/6 Geochemical Code, W. L. Bourcier, Lawrence Livermore National Laboratory Report UCID-20587, November 1985.
- 58     Field Investigation of Keyblock Stability, J. Yow, Jr., Lawrence Livermore National Laboratory Report UCRL-53632, April 1985.
- 59     Application of the Ruthenium and Technetium Thermodynamic Data Bases Used in the EQ3/6 Geochemical Codes, D. Isherwood, Lawrence Livermore National Laboratory Report UCRL-53594, April 1985.

- 60 Metallurgical Analysis of a 304L Stainless Steel Canister from the Spent Fuel Test-Climax, H. Weiss, R. A. Van Konynenburg, and R. D. McCright, Lawrence Livermore National Laboratory Report UCID-20436, April 1985.
- 61 Hydrothermal Interaction of Crushed Topopah Spring Tuff and I-13 Water at 90°C, 150°C, and 250°C Using Dickson-Type Gold Bag Rocking Autoclaves, K. Knauss, W. Beiriger, and D. Peifer, Lawrence Livermore National Laboratory Report UCRL-53630, May 1985.
- 62 Concept for Waste Package Environment Tests in the Yucca Mountain Exploratory Shaft, J. L. Yow, Jr., Lawrence Livermore National Laboratory Report UCID-20450, May 1985.
- 63 Spent Fuel Cladding Corrosion Under Tuff Repository Conditions - Initial Observations, H. D. Smith and V. M. Oversby, Lawrence Livermore National Laboratory Report UCID-20499, June 1985.
- 64 Blind Zones in Acquisition of Discontinuity Orientation Data, J. L. Yow, Jr., in International Journal of Rock Mechanics and Mining Sciences and Geomechanics Abstracts, Vol. 24, No. 5, pp. 317-318 (October 1987), also available as Lawrence Livermore National Laboratory Report UCRL-89960, July 1985.
- 65 FY85 Status Report on Feasibility Assessment of Copper-Base Waste Package Container Materials in a Tuff Repository, R. D. McCright, Lawrence Livermore National Laboratory Report UCID-20509, September 1985.
- 66 Corrosion Processes of Austenitic Stainless Steels and Copper-Based Materials in Gamma-Irradiated Aqueous Environments, R. Glass, R. Van Konynenburg, and G. Overturf, in Corrosion 86, paper #258 (March 17-21, 1986), Houston, TX, also available as Lawrence Livermore National Laboratory Report UCRL-92941, September 1985.
- 67 Derivation of a Waste Package Source Term for NNWSI from the Results of Laboratory Experiments, V. M. Oversby and C. N. Wilson, in Proceedings of the Materials Research Society Symposium on the Scientific Basis for Nuclear Waste Management, Stockholm, Sweden, Vol. 50, pp. 337-346, (1985) also available as Lawrence Livermore National Laboratory Report UCRL-92096, September 1985.
- 68 Water Transport in Topopah Spring Tuff--Implications for a Nuclear Waste Repository in Tuff, W. Lin and W. Daily, Lawrence Livermore National Laboratory Report UCRL-93382 (Preprint only), September 1985.

- 69     A Ground Reaction Curve Based Upon Block Theory, J. L. Yow, Jr. and R. Goodman, in *Journal of Rock Mechanics and Rock Engineering*, Vol. 20, No. 3, pp. 167-190 (July-September 1987), also available as Lawrence Livermore National Laboratory Report UCRL-93431, September 1985.
- 70     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. Piwinskii, Lawrence Livermore National Laboratory Report UCRL-53645, September 1985.
- 71     Reaction of Topopah Spring Tuff with J-13 Water: A Geochemical Modeling Approach Using the EQ3/6 Reaction Path Code, J. Delany, Lawrence Livermore National Laboratory Report UCRL-53631, November 1985.
- 72     Hydrological Properties of Topopah Spring Tuff - Laboratory Measurements, W. Daily, W. Lin, and T. Buscheck, in *Journal of Geophysical Research*, Vol. 92, No. B8, pp. 7854-7864 (July 10, 1987), also available as Lawrence Livermore National Laboratory Report UCRL-94363, December 1985.
- 73     Effectiveness of Geologic Characterization Techniques, Climax Granite Stock, Nevada Test Site, D. G. Wilder and J. L. Yow, Jr., in *Bulletin of the Association of Engineering Geologists*, Vol. XXIV, No. 4, 1987, pp. 537-548, also available as Lawrence Livermore National Laboratory Report UCRL-92687, January 1986.
- 74     Evaluation of Alterant Geophysical Tomography in Welded Tuff, A. Ramirez and W. Daily, in *Journal of Geophysical Research*, Vol. 92, No. B8, pp. 7843-7853 (July 1987), also available as Lawrence Livermore National Laboratory Report UCRL-94291, January 1986.
- 75     An Exact Similarity Solution for Coupled Deformation and Fluid Flow in Discrete Fractures, A. M. Wijesinghe, Lawrence Livermore National Laboratory Report UCID-20675, February 1986.
- 76     Important Radionuclides in High Level Nuclear Waste Disposal: Determination Using a Comparison of the EPA and NRC Regulations, V. Oversby, in *Nuclear and Chemical Waste Management*, Vol. 7, No. 2, pp. 149-161 (1987), Lawrence Livermore National Laboratory Report UCRL-94222, February 1986.
- 77     The PLUS Family A Set of Computer Programs to Evaluate Analytical Solutions of the Diffusion Equation, D. N. Montan, Lawrence Livermore National Laboratory Report UCID-20680, February 1986.

- 78      Proton Procession Magnetometer, R. Stager, Lawrence Livermore National Laboratory Report UCID-21113, March 1986.
- 79      Analysis and Observation of Keyblock Occurrence in Tunnels in Granite, J. L. Yow, Jr., in Proceedings of the 27th Rock Mechanics Symposium, Alabama, pp. 827-833 (June 23-25, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-93412, March 1986.
- 80      Inelastic Deformations of Fault and Shear Zones in Granitic Rock, D. G. Wilder, in Proceedings of the 27th Rock Mechanics Symposium, Alabama, pp. 868-873 (June 23-25, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-93422, March 1986.
- 81      Some Forms of Transition State Theory, Including Non-Equilibrium Steady State Forms, and Their Applications in Geochemistry, T. J. Wolery, American Journal of Science, also available as Lawrence Livermore National Laboratory Report UCRL-94221, March 1986.
- 82      An Application of Software Quality Assurance to a Specific Scientific Code Development Task, J. J. Dronkers, presented at the 17th California Quality Week, Santa Clara, CA, March 21-22, 1986, also available as Lawrence Livermore National Laboratory Report UCRL-94600, March 1986.
- 83      Thermomechanical Scoping Calculations for the Waste Package Environment Tests, T. R. Butkovich and J. L. Yow, Jr., Lawrence Livermore National Laboratory Report UCID-20758, March 1986.
- 84      Thermal Calculations Pertaining to Experiments in the Yucca Mountain Exploratory Shaft, D. N. Montan, Lawrence Livermore National Laboratory Report UCID-20780, March 1986.
- 85      Estimates of Radionuclide Release From Glass Waste Forms in a Tuff Repository and the Effects on Regulatory Compliance, R. D. Aines, in Advances in Ceramics, Vol. 20, Nuclear Waste Management II, pp. 91-98, the American Ceramic Society, 3rd International Symposium on Nuclear Waste Disposal, Chicago, ILL (April 1986), also available as Lawrence Livermore National Laboratory Report UCRL-93735, April 1986.
- 86      A Monte Carlo Investigation of a Proposed Screen for NX-Borehole Jack Data, M. C. Alexrod, S. P. Verrill, W. C. Patrick, and J. L. Yow, Jr., in ASTM Geotechnical Testing Journal, Vol. 11, No. 1, pp. 20-29, (March 1988), also available as Lawrence Livermore National Laboratory Report UCRL-94087, April 1986.

- 87     Radiation Chemical Effects in Experiments to Study the Reaction of Glass in a Gamma-Irradiated Air Groundwater and Tuff Environment, R. A. Van Konynenburg, Lawrence Livermore National Laboratory Report UCRL-53719, May 1986.
- 88     Application of EO3/6 to Modeling of Nuclear Waste Glass Behavior in a Tuff Repository, R. Aines, Lawrence Livermore National Laboratory Report UCID-20895, May 1986.
- 89     Precipitation Kinetics Option for the EO3/6 Geochemical Reaction Path Code, J. Delany, I. Puigdomenech, and T. Wolery, Lawrence Livermore National Laboratory Report UCRL-53642, May 1986.
- 90     Geochemical Gradients in the Topopah Spring Member of the Paintbrush Tuff: Evidence for Eruption across a Magmatic Interface, B. C. Schuraytz, T. Vogel, and L. Younker, Lawrence Livermore National Laboratory Report UCRL-53698, June 1986.
- 91     The Tuff Reaction Vessel Experiment, F. Bazan and J. H. Rego, Lawrence Livermore National Laboratory Report UCRL-53735, June 1986.
- 92     Geochemical Modeling (EO3/6) Plan Office of Civilian Radioactive Waste Management Program, W. McKenzie, T. Wolery, J. Delany, R. Silva, K. Jackson, W. Bourcier, and D. Emerson, Lawrence Livermore National Laboratory Report UCID-20864, August 1986.
- 93     Feasibility Assessment of Copper-Based Waste Package Container Materials in Tuff Repository, C. Acton and R. McCright, Lawrence Livermore National Laboratory Report UCID-20847, August 1986.
- 94     Reference Waste Package Environment Report, W. Glassley, Lawrence Livermore National Laboratory Report UCRL-53726, October 1986.
- 95     Waste Package Assessment: Deterministic System Model Program Scope and Specification, W. O'Connell and R. Drach, Lawrence Livermore National Laboratory Report UCRL-53761, October 1986.
- 96     Carbon-14 in Waste Packages for Spent Fuel in a Tuff Repository, R. Van Konynenburg, C. Smith, C. Culham, and H. D. Smith, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 185-196, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-94708, October 1986.

- 97      Scientific Investigation Plan for NNWSI, WBS Element 1.2.2.5.L, NNWSI Waste Package Performance Assessment, K. Eggert, W. O'Connell, and D. Lappa, Lawrence Livermore National Laboratory Report UCID-20967, October 1986.
- 98      Reaction of Vitric Topopah Spring Tuff and I-13 Ground Water Under Hydrothermal Conditions Using Dickson-Type, Gold-Bag Rocking Autoclaves, K. Knauss and D. Peifer, Lawrence Livermore National Laboratory Report UCRL-53795, November 1986.
- 99      The Effects of Gamma Radiation on Groundwater Chemistry and Glass Reaction in a Saturated Tuff Environment, W. L. Ebert, J. K. Bates, T. J. Gerding, and R. A. Van Konynenburg, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 613-622, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-95884, December 1986.
- 100     Experimental Study of the Dissolution of Spent PWR Fuel at 85°C in Natural Groundwater, C. Wilson and H. Shaw, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 123-130, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-94633, December 1986.
- 101     Integrated Testing of SRL-165 Glass Waste Form, D. Phinney, R. Ryerson, V. Oversby, R. Lanford, R. Aines, and J. Bates, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 433-446, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-94658, December 1986.
- 102     Spent Fuel as a Waste Form - Data Needs to Allow Long Term Performance Assessment Under Repository Disposal Conditions, V. M. Oversby, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 87-101, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-94659, December 1986.
- 103     Zeolitization of Glassy Topopah Spring Tuff Under Hydrothermal Conditions, K. G. Knauss, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 737-745, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-94664, December 1986.

- 104     Copper Corrosion in Irradiated Environments. The Influence of H<sub>2</sub>O<sub>2</sub> on the Electrochemistry of Copper Dissolution in HCl Electrolyte, W. H. Smyrl, B. T. Bell, R. T. Atanasoski, and R. S. Glass, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 591-601, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-95961, December 1986.
- 105     Hydrogen Speciation in Hydrated Layers on Nuclear Waste Glass, R. D. Aines, H. C. Weed, and J. K. Bates, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 547-558, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-95962, January 1987.
- 106     Leaching of Actinide-Doped Nuclear Waste Glass in a Tuff-Dominated System, F. Bazan, J. Rego, and R. Aines, in Materials Research Society Symposium Proceedings, Vol. 84, pp. 447-458, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-94721, January 1987.
- 107     Preliminary Evaluation of an Electromagnetic Experiment to Map In Situ Water in Heated Welded Tuff, W. Daily and A. Ramirez, Water Resources Research, Vol. 25, No. 6, pp 1083-1096 (June 1989), also available as Lawrence Livermore National Laboratory Report UCRL-96816, February 1987.
- 108     The PLUS Family - A Set of Computer Programs to Evaluate Analytical Solutions of the Diffusion Equation and Thermoelasticity, D. Montan, Lawrence Livermore National Laboratory Report UCID-21099, February 1987.
- 109     Influence of Stress-Induced Deformation on Observed Water Flow in Fractures at the Climax Granitic Stock, D. G. Wilder, in 28th U.S. Symposium on Rock Mechanics, Tucson, AZ, pp. 491-500 (June 26-July 1, 1987), also available as Lawrence Livermore National Laboratory Report UCRL-95539, March 1987.
- 110     Electromagnetic Experiment to Map In Situ Water in Heated Welded Tuff: Preliminary Results, A. Ramirez and W. Daily, in 28th U.S. Symposium on Rock Mechanics, Tucson, AZ, pp. 37-46 (June 26-July 1, 1987), also available as Lawrence Livermore National Laboratory Report UCRL-96318, March 1987.
- 111     An Experiment to Determine Drilling Water Imbibition by In Situ Densely Welded Tuff, W. Daily and A. Ramirez, Lawrence Livermore National Laboratory Report UCID-21249, Rev. 1, April 1987.

- 112      Thermomechanical Calculations Pertaining to Experiments in the Yucca Mountain Exploratory Shaft, D. Montan, Lawrence Livermore National Laboratory Report UCID-21100, April 1987.
- 113      Hydrothermal Interaction of Solid Wafers of Topopah Spring Tuff with I-13 Water at 90°C and 150°C Using Dickson-Type, Gold-Bag Rocking Autoclaves: Long-Term Experiments, K. Knauss, W. Beiriger, and D. Peifer, Lawrence Livermore National Laboratory Report UCRL-53722, May 1987.
- 114      Plan for Integrated Testing for NNWSI Non EO3/6 Data Base Portion, V. M. Oversby, Lawrence Livermore National Laboratory Report UCID-21274, May 1987.
- 115      Test Concept for Waste Package Environment Tests at Yucca Mountain, J. L. Yow, Jr., in 28th U.S. Symposium on Rock Mechanics, Tucson, AZ, pp. 1035-1042 (June 26-July 1, 1987), also available as Lawrence Livermore National Laboratory Report UCRL-95568, June 1987.
- 116      Synthesis and Characterization of Uranium Silicate Minerals, S. Nguyen, R. Silva, and H. Weed, Report included in LLNL Nuclear Chemistry Division Annual Report, Lawrence Livermore National Laboratory, August 1987.
- 117      The Dissolution Kinetics of Quartz as a Function of pH and Time at 70°C, K. Knauss and T. Wolery, in *Geochimica and Cosmochimica Acta*, Vol. 52, No. 1, pp. 43-53 (January 1988), also available as Lawrence Livermore National Laboratory Report UCRL-96071, September 1987.
- 118      Plan for Glass Waste Form Testing for NNWSI, R. D. Aines, Lawrence Livermore National Laboratory Report UCID-21190, September 1987.
- 119      Estimates of the Hydrologic Impact of Drilling Water on Core Samples Taken from Partially Saturated Densely Welded Tuff, T. Buscheck and J. Nitao, Lawrence Livermore National Laboratory Report UCID-21294, September 1987.
- 120      Impact of Phase Stability on the Corrosion Behavior of the Austenitic Candidate Materials for NNWSI, D. Bullen, G. Gdowski, and D. McCright, in Materials Research Society Symposium Proceedings, Boston, MA (November 30-December 5, 1987), Vol. 112, pp 795-803, also available as Lawrence Livermore National Laboratory Report UCRL-97562, October 1987.



- 121 Thermodynamic Data Bases for Multivalent Elements: An Example for Ruthenium, J. A. Rard, International Conference on Thermodynamics of Aqueous Systems with Industrial Applications, Warrenton, VA (May 10-14, 1987), (to be published in Thermo-dynamics of Aqueous Systems), also available as Lawrence Livermore National Laboratory Report UCRL-96555, November 1987.
- 122 Plan for Spent Fuel Waste Form Testing for NNWSI, H. Shaw, Lawrence Livermore National Laboratory Report UCID-21272, November 1987.
- 123 Geochemical Simulation of Reaction between Spent Fuel Waste Form and I-13 Water at 25 and 90°C, C. Bruton and H. Shaw, in Materials Research Society Symposium Proceedings, Boston, MA (November 30-December 5, 1987), Vol. 112, pp 485-494, also available as Lawrence Livermore National Laboratory Report UCRL-96702, November 1987.
- 124 Geochemical Simulation of Dissolution of West Valley and DWPF Glasses in I-13 Water at 90°C, C. Bruton, in Materials Research Society Symposium Proceedings, Boston, MA (November 30-December 5, 1987), Vol. 112, pp. 607-619, also available as Lawrence Livermore National Laboratory Report UCRL-96703, November 1987.
- 125 An Approximate Calculation of Advective Gas Phase Transport of <sup>14</sup>C at Yucca Mountain, Nevada, R. Knapp, Nuclear and Chemical Waste Management Journal, also available as Lawrence Livermore National Laboratory Report UCRL-97805, November 1987.
- 126 Preliminary Technique Assessment for Nondestructive Evaluation Certification of the NNWSI Disposal Container Closure, R. A. Day, Lawrence Livermore National Laboratory Report UCID-21323, November 1987.
- 127 Progress Report on the Results of Testing Advanced Conceptual Design Metal Barrier Materials Under Relevant Environmental Conditions for a Tuff Repository, D. McCright, W. Halsey, and R. Van Konynenburg, Lawrence Livermore National Laboratory Report UCID-21044, December 1987.
- 128 Spent Fuel Performance Data: An Analysis of Data Revelant to the NNWSI Project, V. Oversby and H. Shaw, Lawrence Livermore National Laboratory Report UCID-20926, December 1987.
- 129 Interim Report on Modeling Sorption with EQ3/6, B. Viani, Lawrence Livermore National Laboratory Report UCID-21308, January 1988.

- 130 Plan for Waste Package Environment for NNWSI, W. Glassley, Lawrence Livermore National Laboratory Report UCID-21326, February 1988.
- 131 Plan for Design, Fabrication, and Prototype Testing for NNWSI, E. W. Russell and T. A. Nelson, Lawrence Livermore National Laboratory Report UCID-21347, February 1988.
- 132 Plan for Metal Barrier Selection and Testing for NNWSI, W. G. Halsey and R. D. McCright, Lawrence Livermore National Laboratory Report UCID-21262, April, 1988.
- 133 Hydrological Properties of Topopah Spring Tuff Under a Thermal Gradient Laboratory Results, W. Lin and W. Daily, International Journal of Rock Mechanics (*in press* 1990), also available as Lawrence Livermore National Laboratory Report UCRL-96926, April 1988.
- 134 MCRT User's Guide and Documentation, K. Jackson, T. Wolery, W. Bourcier, J. Delany, R. Moore, M. Clinnick, and S. Lundeen, Lawrence Livermore National Laboratory Report UCID-21406, November 1988.
- 135 Numerical Modeling of the Thermal and Hydrological Environment around a Nuclear Waste Package using the Equivalent Continuum Approximation: Horizontal Emplacement, John Nitao, Lawrence Livermore National Laboratory Report UCID-21444, May 1988.
- 136 Estimates of the Width of the Wetting Zone Along a Fracture Subjected to an Episodic Infiltration Event in Variably Saturated, Densely Welded Tuff, T. Buscheck and J. Nitao, Lawrence Livermore National Laboratory Report UCID-21579, May 1988.
- 137 Assessment of Engineered Barrier Systems and Design of Waste Packages, L. Ramspott, American Nuclear Society Meeting, San Diego, CA, June 1988, also available as Lawrence Livermore National Laboratory Report UCRL-98029, June 1988.
- 138 Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Overview, J. C. Farmer, R. D. McCright, and J. N. Kass, Lawrence Livermore National Laboratory Report UCID-21362 Overview, June 1988.
- 139 Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Volume 1, Phase Stability, D. B. Bullen and G. E. Gdowski (Science & Engineering Associates, Inc.), Lawrence Livermore National Laboratory Report UCID-21362 Vol. 1, August 1988.

- 140     Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Volume 2, Oxidation and Corrosion, D. B. Bullen and G. E. Gdowski (Science & Engineering Associates, Inc.), Lawrence Livermore National Laboratory Report UCID-21362 Vol. 2, August 1988.
- 141     Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Volume 3, Localized Corrosion and Stress Corrosion Cracking of Austenitic Alloys, J. C. Farmer, R. A. Van Konynenburg, D. McCright (LLNL), and D. B. Bullen (Science & Engineering Associates, Inc.), Lawrence Livermore National Laboratory Report UCID-21362 Vol. 3, April 1988.
- 142     Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Volume 4, Stress Corrosion Cracking of Copper-Based Alloys, J. C. Farmer, R. A. Van Konynenburg, R. D. McCright (LLNL), and G. E. Gdowski (Science & Engineering Associates, Inc.), Lawrence Livermore National Laboratory Report UCID-21362 Vol. 4, May 1988.
- 143     Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Volume 5, Localized Corrosion of Copper-Based Alloys, J. C. Farmer, R. A. Van Konynenburg, R. D. McCright (LLNL), and G. E. Gdowski (Science & Engineering Associates, Inc.), Lawrence Livermore National Laboratory Report UCID-21362 Vol. 5, June 1988.
- 144     Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Volume 6, Effects of Hydrogen in Austenitic and Copper-Based Alloys, G. E. Gdowski and D. B. Bullen (Science & Engineering Associates, Inc.), Lawrence Livermore National Laboratory Report UCID-21362 Vol. 6, August 1988.
- 145     Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Volume 7, Weldability of Austenitic Alloys, M. J. Strum, H. Weiss, and J. C. Farmer (LLNL), and D. B. Bullen (Science & Engineering Associates, Inc.), Lawrence Livermore National Laboratory Report UCID-21362 Vol. 7, June 1988.
- 146     Survey of Degradation Modes of Candidate Materials for High-Level Radioactive Waste Disposal Containers, Volume 8, Weldability of Austenitic Alloys, D. B. Bullen and G. E. Gdowski (Science & Engineering Associates, Inc.), and H. Weiss (LLNL), Lawrence Livermore National Laboratory Report UCID-21362 Vol. 8, June 1988.

- 147 Simulations of the Transport of Radionuclides by Liquid Diffusion at Yucca Mountain - Comparisons With and Without Backfill, J. Nitao, UCID-21466, July 1988.
- 148 Annotated History of Container Candidate Material Selection, R. McCright, Lawrence Livermore National Laboratory Report UCID-21472, July 1988.
- 149 Thermal Performance of a Buried Nuclear Waste Storage Container Storing a Hybrid Mix of PWR and BWR Spent Fuel Rods, G. Johnson, Lawrence Livermore National Laboratory Report UCID-21414, September 1988.
- 150 Uranium Transport in Topopah Spring Tuff: An Ion-Microscope Investigation, K. McKeegan, D. Phinney, V. Oversby, M. Buckholtz-ten Brink, and D. K. Smith, Materials Research Society, Scientific Basis for Nuclear Waste Management XII, Vol. 127, pp. 813-821, Berlin, Germany (October 1988), also available as Lawrence Livermore National Laboratory Report UCRL-99734, Rev. 1, October 1988.
- 151 Localized Corrosion and Stress Corrosion Cracking of Candidate Materials for High-Level Radioactive Waste Disposal Containers in US: A Literature Review, J. Farmer and D. McCright, Materials Research Society (October 1988), UCRL-98756, November 1988.
- 152 Preliminary Scoping Calculations of Hydrothermal Flow in Variably Saturated, Fractured, Welded Tuff During the Engineered Barrier Design Test at the Yucca Mountain Exploratory Shaft Test Site, T. Buscheck and J. Nitao, UCID-21571, November 1988.
- 153 Performance Implications of Waste Package Emplacement Orientation, D. Wilder, Lawrence Livermore National Laboratory Report UCID-21607, November 1988.
- 154 A Review of Models Relevant to the Predication of Performance of High-Level Radioactive Waste Disposal Containers, J. Farmer and D. McCright, Proceedings of the National Association Corrosion Engineers Conference, New Orleans, LA, (April 17-21, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100172, November 1988.
- 155 Geochemical Modeling of Radioactive Waste Glass Dissolution Using EQ3/6: Preliminary Results and Data Needs, W. L. Bourcier, Lawrence Livermore National Laboratory Report UCID-21869, January 1990.

- 156 Waste Package Performance Assessment for the Yucca Mountain Project, W. O'Connell, D. Lappa, and R. Thatcher, Proceedings for the Waste Management '89 Symposia, Tucson, AZ (March 1-3, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100395, January 1989.
- 157 Chemical Thermodynamics of Technetium, J. Rard, submitted for inclusion in the book in Chemical Thermodynamics of Technetium, Nuclear Energy Agency, Paris, France, Lawrence Livermore National Laboratory Report UCRL-100554, February 1989.
- 158 Evaluation of the Post-Emplacement Environment of High-Level Radioactive Waste Packages at Yucca Mountain, Nevada, W. Glassley, Proceedings for the Waste Management '89 Symposia, Tucson, AZ (March 1-3, 1989), Vol. 1, pp. 477-483, also available as Lawrence Livermore National Laboratory Report UCRL-100603, March 1989.
- 159 Fabrication and Closure Development of Nuclear Waste Containers for Storage at Nevada's Yucca Mountain, E. W. Russell, T. Nelson, H. Domian, D. LaCount, E. Robitz, and K. Stein, Proceedings of the First International High-Level Radioactive Waste Management Conference, Las Vegas, NV (April 8-12, 1990), also available as Lawrence Livermore National Laboratory Report UCRL-99513, April 1989.
- 160 Yucca Mountain Project Container Fabrication, Closure, and Non-Destructive Evaluation Development Activities, E. Russell and T. Nelson, Proceedings of the Workshop on Corrosion of Nuclear Waste Containers, Winnipeg, Canada (February 9-10, 1988), also available as Lawrence Livermore National Laboratory Report UCRL-101183, June 1989.
- 161 Yucca Mountain Project Waste Package Design for MRS System Studies, T. Nelson, E. Russell, G. L. Johnson, R. Morissette, D. Stahl, L. LaMonica and G. Hertel, Lawrence Livermore National Laboratory Report UCID-21700, April 1989.
- 162 On the Movement of a Liquid Front in an Unsaturated, Fractured Porous Medium, Part I, J. Nitao and T. Buscheck, Lawrence Livermore National Laboratory Report UCID-21714, April 1989.
- 163 Evaluation of Copper, Aluminum Bronze, and Copper-Nickel for YMP Container Material, J. Kass, Proceedings of the Workshop on Corrosion of Nuclear Waste Containers, Winnipeg, Canada (February 9-10, 1988), also available as Lawrence Livermore National Laboratory Report UCRL-101097, May 1989.

- 164     A Kinetic Model for Dissolution of Borosilicate Glass, W. L. Bourcier, K. G. Knauss and C. I. Merzbacher, the Proceedings of the 6th International Symposium on Water-Rock Interaction, pp. 107-110, Malvern, United Kingdom (August 3-8, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-101285, May 1989.
- 165     The EQ3/6 Software Package for Geochemical Modeling: Current Status, T. J. Wolery, K. J. Jackson, W. L. Bourcier, C. J. Bruton, B. E. Viani, K. G. Knauss, and J. M. Delany, Proceedings of the American Chemical Society Conference, pp. 104-116, Los Angeles, CA (September 25-30, 1988), also available as Lawrence Livermore National Laboratory Report UCRL-98729, June 1989.
- 166     A Lagrangian Reactive Transport Simulator with Multiple Paths and Stationary-States: Concepts, Implementation and Verification, R. Knapp, Materials Research Society, Proceedings Scientific Basis for Nuclear Waste Management XIII, Vol. 176, pp. 695-702, Boston, MA (September 27-30, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100952, June 1989.
- 167     Laboratory Determined Suction Potential of Topopah Spring Tuff, W. Daily and W. Lin, submitted to Water Resources Research, also available as Lawrence Livermore National Laboratory Report UCRL-102127, June 1989.
- 168     Prototype Engineered Barrier System Field Tests -- Progress Report, A. Ramirez, J. Beatty, T. Buscheck, R. Carlson, W. Daily, R. LaTorre, K. Lee, W. Lin, N. Mao, J. Nitao, D. Towse, T. Ueng, D. Watwood, and D. Wilder, American Nuclear Society, Proceedings Nuclear Waste Isolation in an Unsaturated Zone, Focus '89, pp.30-37, Las Vegas, NV (September 17-21, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-101615, July 1989.
- 169     Microwave Measurements of Water Vapor Partial Pressure at Temperatures up to 350°C, V. Latorre, American Nuclear Society, Proceedings Nuclear Waste Isolation in an Unsaturated Zone, Focus '89, pp. 434-440, Las Vegas, NV (September 17-21 1989) also available as Lawrence Livermore National Laboratory Report UCRL-101866, July 1989.
- 170     Current Status of Waste Package Designs for the Yucca Mountain Project, L. B. Ballou, Proceedings of the Institute of Nuclear Materials Management 30th Annual Meeting, Orlando, FL., (July 9-12, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100790, July 1989.

- 171 Laboratory Study of Fracture Healing in Topopah Spring Tuff - Implications for Near Field Hydrology, W. Lin, American Nuclear Society, Proceeding Nuclear Waste Isolation in an Unsaturated Zone, Focus '89, pp. 443-449, Las Vegas, NV (September 17-21, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100624, July 1989.
- 172 On the Movement of a Liquid Front in an Unsaturated, Fractured Porous Medium, Part II -- Mathematical Theory, J. Nitao, Lawrence Livermore National Laboratory Report UCID-21743, July 1989.
- 173 On the Infiltration of a Liquid Front In an Unsaturated, Fractured Porous Medium, J. Nitao and T. Buscheck, American Nuclear Society, Proceedings Nuclear Waste Isolation in an Unsaturated Zone, Focus '89, pp. 381-397, Las Vegas, NV (September 17-21, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100777, August 1989.
- 174 Calibration of a High Frequency Electromagnetic Measurement System Used in Geophysics, W. D. Daily, V. R. Latorre, and H. M. Buettner, submitted to IEEE Geoscience and Remote Sensing Journal, also available as Lawrence Livermore National Laboratory Report UCRL-102049, September 1989.
- 175 Statistical Model for Grain Boundary and Grain Volume Oxidation Kinetics in UO<sub>2</sub> Spent Fuel, R. Stout, H. Shaw, and R. Einziger, Materials Research Society, Proceedings Scientific Basis for Nuclear Waste Management XIII, Vol. 176, pp. 475-488, Boston, MA (November 27-30, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100859, September 1989.
- 176 High Frequency Electromagnetic Tomography, W. Daily, A. Ramirez, T. Ueng, and R. Latorre, American Nuclear Society, Proceedings Nuclear Waste Isolation in an Unsaturated Zone, Focus '89, pp. 409-416, Las Vegas, NV (September 17-21, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-101865, September 1989.
- 177 Dissolution Kinetics of a Simple Analogue Nuclear Waste Glass as a Function of pH, Time and Temperature, K. G. Knauss, W. L. Bourcier, K. D. McKeegan, C. I. Merzbacher, S. N. Nguyen, F. J. Ryerson, D. K. Smith, and H. C. Weed, Materials Research Society, Proceedings Scientific Basis for Nuclear Waste Management XIII, Vol. 176, pp. 371-381, Boston, MA (November 27-30, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-101112, September 1989.

- 178     A Kinetic Model for Borosilicate Glass Dissolution Based on the Dissolution Affinity of a Surface Alteration Layer, W. L. Bourcier, D. W. Peiffer, K. G. Knauss, K. D. McKeegan, and D. K. Smith, Materials Research Society, Proceedings Scientific Basis for Nuclear Waste Management XIII, Vol. 176, pp. 209-216, Boston, MA (November 27-30, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-101107, September 1989.
- 179     Selection Criteria for Container Materials at the Proposed Yucca Mountain High Level Nuclear Waste Repository, W. G. Halsey, National Association of Corrosion Engineers, Las Vegas, NV (April 23-28, 1990), also available as Lawrence Livermore National Laboratory Report UCRL-102285, October 1989.
- 180     A Deformation and Thermodynamic Model for Hydride Precipitation Kinetics in Spent Fuel Cladding, R. B. Stout, Lawrence Livermore National Laboratory Report UCRL-100860, October 1989.
- 181     Fabrication and Closure Development of Corrosion Resistant Containers for Nevada's Yucca Mountain High-Level Nuclear Waste Repository, E. W. Russell, T. A. Nelson, H. A. Domian, D. F. LaCount, E. S. Robitz, and K. O. Stein, NACE Corrosion/90 Conference, Las Vegas, NV (April 23-27, 1990), also available as Lawrence Livermore National Laboratory Report UCRL-102081, November 1989.
- 182     Preclosure Safety Analysis for a Prospective Yucca Mountain Conceptual Design Repository, C. W. Ma, (Bechtel) and L. J. Jardine, High Level Radioactive Waste Management Conference (April 8-12, 1990), Las Vegas, NV, Vol. 1, pp 370-379, also available as Lawrence Livermore National Laboratory Report UCRL-102115, December 1989.
- 183     Geochemical Modeling: An Integrated Approach to Nuclear Waste Disposal Issues, C. J. Bruton, B. E. Viani, W. L. Bourcier, K. J. Jackson, and R. D. Aines, High Level Radioactive Waste Management Conference (April 8-12, 1990), Las Vegas, NV, Vol. 1, pp 594-595, also available as Lawrence Livermore National Laboratory Report UCRL-102019, December 1989.
- 184     Status of Integrated Performance Assessment of the Waste Packages and Engineered Barrier System, W. J. O'Connell, High Level Radioactive Waste Management Conference (April 8-12, 1990), Las Vegas, NV, Vol. 1, pp 380-387, also available as Lawrence Livermore National Laboratory Report UCRL-102114, December 1989.



- 185     The Use of Performance Assessments in Yucca Mountain Repository Waste Package Design Activities, L. J. Jardine, High Level Radioactive Waste Management Conference (April 8-12, 1990), Vol. 2, pp. 1284-1286, Las Vegas, NV, also available as Lawrence Livermore National Laboratory Report UCRL-102116, January 1990.
- 186     Prototype Heater Test of the Environment Around a Simulated Waste Package, A. L. Ramirez, T. A. Buscheck, R. Carlson, W. Daily, V. R. Latorre, K. Lee, W. Lin, N. Mao, D. Towse, T. S. Ueng, and D. Watwood, High Level Radioactive Waste Management Conference (April 8-12, 1990), Las Vegas, NV, Vol. 2, pp. 870-881, also available as Lawrence Livermore National Laboratory Report UCRL-101693, December 1989.
- 187     Container Material Performance Assessment Modeling and Failure Modes, W. L. Clarke, J. C. Farmer, W. G. Halsey, and R. D. McCright, High Level Radioactive Waste Management Conference (April 8-12, 1990), Las Vegas, NV, Vol. 1, pp 437-442, also available as Lawrence Livermore National Laboratory Report UCRL-101877, January 1990.
- 188     Natural Glass Analogues to Alteration of Nuclear Waste Glass: A Review and Recommendations for Further Study, W. F. McKenzie, Lawrence Livermore National Laboratory Report UCID-21871 Report, January 1990.
- 189     Chemical Thermodynamics of Technetium II, J. A. Rard, prepared for inclusion in the book of Chemical Thermodynamics of Technetium, Nuclear Energy Agency, Paris, France, also available as Lawrence Livermore National Laboratory Report UCRL-102708, November 1989
- 190     V-TOUGH - An Enhanced Version of the TOUGH Code for the Thermal and Hydrologic Simulation of Large-Scale Problems in Nuclear Waste Isolation, J. J. Nitao, Lawrence Livermore National Laboratory Report UCID-21954 Report, September 1989.

## RELATED REPORTS BY OTHER AGENCIES

- OA-1    Permeability and Pore-Fluid Chemistry of the Bullfrog Tuff in a Temperature Gradient: Summary of Results, J. D. Byerlee, C. A. Morrow, and D. E. Moore, U.S. Geological Survey Open-File Report 83-475, also available as Lawrence Livermore National Laboratory Contractor Report UCRL-15790, June 1983.
  
- OA-2    The Characteristics of Spent LWR Fuel Relevant to its Storage in Geologic Repositories, R. E. Woodley, Hanford Engineering Development Laboratory, HEDL TME 83-28, submitted to Lawrence Livermore National Laboratory under subcontract, October 1983.
  
- OA-3    Permeability and Pore-Fluid Chemistry of the Topopah Spring Member of the Paintbrush Tuff, Nevada Test Site, in a Temperature Gradient: Application to Nuclear Waste Storage, C. A. Morrow, D. E. Moore, and J. D. Byerlee, Proceedings of the Materials Research Society Symposium, Boston, MA, Vol. 26, pp. 883-890 (1984), November 1983.
  
- OA-4    Test Plan for Spent Fuel Cladding Containment Credit Tests, C. N. Wilson, Hanford Engineering Development Laboratory, HEDL TC-2353-2, submitted to Lawrence Livermore National Laboratory under subcontract, November 1983.
  
- OA-5    Changes in Permeability and Fluid Chemistry of the Topopah Spring Member of the Paintbrush Tuff (NTS) When Held in a Temperature Gradient: Summary of Results, D. E. Moore, C. A. Morrow, and J. D. Byerlee, USGS (USGS O.F. 84-273), submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-15620, June 1984.
  
- OA-6    Effects of Tuff Waste Package Components on Release From 76-68 Simulated Waste Glass, G. L. McVay and G. R. Robinson, Pacific Northwest Laboratory, PNL-4897, submitted to Lawrence Livermore National Laboratory under subcontract, August 1984.
  
- OA-7    Test Plan for Series 2 Spent Fuel Cladding Containment Credit Tests, C. N. Wilson, Hanford Engineering Development Laboratory, HEDL-TC-2353-3, submitted to Lawrence Livermore National Laboratory under subcontract, October 1984.
  
- OA-8    Spent Fuel Cladding Characteristics and Choice of Experimental Specimens for Cladding-Corrosion Evaluation Under Tuff Repository Conditions, H. D. Smith, Hanford Engineering Development Laboratory, HEDL-TC-2530, submitted to Lawrence Livermore National Laboratory under subcontract, November 1984.

- OA-9 NNWSI Waste Form Performance Test Development, J. K. Bates and T. J. Gerding, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Proceedings of the Materials Research Society Meeting, Vol. 44, pp. 295-302, Boston, MA (November 1984).
- OA-10 Zircaloy Spent Fuel Cladding Electrochemical Corrosion Scoping Experiment, H. D. Smith, Hanford Engineering Development Laboratory, HEDL-TC-2562, submitted to Lawrence Livermore National Laboratory under subcontract, December 1984.
- OA-11 NNWSI Phase II Materials Interaction Test Procedure and Preliminary Results, J. K. Bates and T. J. Gerding, Argonne National Laboratory, ANL 84-81, submitted to Lawrence Livermore National Laboratory under subcontract, January 1985.
- OA-12 Low Temperature Spent Fuel Oxidation Under Tuff Repository Conditions, R. E. Einziger and R. E. Woodley, Proceedings of the Waste Management 85 Meeting, Vol. 1, pp. 505-512, Tucson, AZ (March 25-29, 1985), Hanford Engineering Development Laboratory Report, HEDL-SA-3271FP, submitted to Lawrence Livermore National Laboratory under subcontract, February 1985.
- OA-13 NNWSI Waste Form Test Method for Unsaturated Disposal Conditions, J. K. Bates and T. J. Gerding, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Proceedings of the Waste Management 85 Meeting, Vol. 1, pp. 459-465, Tucson, AZ (March 25-29, 1985), also available as Lawrence Livermore National Laboratory Contractor Report UCRL-15723, March 1985.
- OA-14 Evaluation of the Potential for Spent Fuel Oxidation Under Tuff Repository Conditions, R.E. Einziger and R. E. Woodley, Hanford Engineering Development Laboratory, HEDL 7452, submitted to Lawrence Livermore National Laboratory under subcontract, March 1985.
- OA-15 Microstructural Characteristics of PWR Spent Fuel Relative to Its Leaching Behavior, C. N. Wilson, Hanford Engineering Development Laboratory, HEDL-SA-3313, submitted to Lawrence Livermore National Laboratory under subcontract, American Ceramic Society 87th Annual Meeting, Cincinnati, OH (May 5-9, 1985), also available as Lawrence Livermore National Laboratory Contractor Report UCRL-15976, April 1985.

- OA-16 Results from NNWSI Series 1 Spent Fuel Leach Tests, C. N. Wilson, Hanford Engineering Development Laboratory, HEDL-TME 84-30, submitted to Lawrence Livermore National Laboratory under subcontract, May 1985.
- OA-17 Technical Test Description of Activities to Determine the Potential for Spent Fuel Oxidation in a Tuff Repository, R. E. Einziger, Hanford Engineering Development Laboratory, HEDL-7540, submitted to Lawrence Livermore National Laboratory under subcontract, June 1985.
- OA-18 Zircaloy Cladding Degradation in a Tuff Repository, Initial Experimental Plan, H. D. Smith, Hanford Engineering Development Laboratory, HEDL-7455, Rev. 1, submitted to Lawrence Livermore National Laboratory under subcontract, July 1985.
- OA-19 High Temperature Permeability of Some Nevada Test Site Tuffs, D. E. Moore, C. A. Morrow, and J. L. Byerlee, USGS, in *Journal of Geophysical Research*, Vol. 91, No. B2, pp. 2163-2171, February 1986.
- OA-20 Test Plan for Series 2 Thermogravimetric Analyses of Spent Fuel Oxidation, R. E. Einziger and R. E. Woodley, Hanford Engineering Development Laboratory, HEDL-7556, submitted to Lawrence Livermore National Laboratory under subcontract, February 1986.
- OA-21 The Reaction of Glass During Gamma Irradiation in a Saturated Tuff Environment, Part I: SRL 165 Glass, J. K. Bates, D. F. Fischer, and T. J. Gerding, Argonne National Laboratory Report, ANL 85-62, submitted to Lawrence Livermore National Laboratory under subcontract, February 1986.
- OA-22 "C-Ring" Stress Corrosion Cracking Scoping Experiment for Zircaloy Spent Fuel Cladding, H. D. Smith, Hanford Engineering Development Laboratory, Report HEDL-7546, submitted to Lawrence Livermore National Laboratory under subcontract, March 1986.
- OA-23 NNWSI Waste Form Testing at Argonne National Laboratory, Semi-annual Report, July-December 1985, J. K. Bates, T. J. Gerding, T. A. Abrajano, Jr., and W. Ebert, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-15801, March 1986.
- OA-24 Zircaloy Spent Fuel Cladding Electrochemical Corrosion Experiment at 170 and 120 PSIA H<sub>2</sub>O, H. D. Smith, Hanford Engineering Development Laboratory Report, HEDL-7545, submitted to Lawrence Livermore National Laboratory under subcontract, April 1986.

- OA-25 Test Plan for Series 3 NNWSI Spent Fuel Leaching/Dissolution Tests, C. N. Wilson, Hanford Engineering Development Laboratory, HEDL-7577, submitted to Lawrence Livermore National Laboratory under subcontract, April 1986.
- OA-26 The Effects of Gamma Radiation on Groundwater Chemistry and Glass Leaching as Related to the NNWSI Repository Site, T. A. Abrajano, J. K. Bates, W. L. Ebert, and T. J. Gerding, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contract Report UCRL-15825, May 1986.
- OA-27 Test Plan for Long-Term, Low-Temperature Oxidation of Spent Fuel Series 1, R. E. Einziger, Westinghouse Hanford Company Report, HEDL-7560, submitted to Lawrence Livermore National Laboratory under subcontract, June 1986.
- OA-28 Corrosion of Copper-Based Materials in Gamma Radiation, W. Yunker, Hanford Engineering Development Laboratory Report, HEDL-7612, submitted to Lawrence Livermore National Laboratory under subcontract, June 1986.
- OA-29 One-Year Results of the NNWSI Unsaturated Test Procedure: SRL 165 Glass Application, J. K. Bates and T. J. Gerding, Argonne National Laboratory, ANL-85-41, submitted to Lawrence Livermore National Laboratory under subcontract, August 1986.
- OA-30 Transport and Reaction Kinetics at the Glass: Solution Interface Regions: Results of Repository Oriented Leaching Experiments, T. A. Abrajano and J. K. Bates, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society Symposium Proceedings, Vol. 84, pp. 533-546, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Contractor Report UCRL-15881, December 1986.
- OA-31 Long-Term Corrosion Behavior of Copper-Based Materials in a Gamma-Irradiated Environment, W. Yunker and R. S. Glass, Westinghouse Hanford Company, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society Symposium Proceedings, Vol. 84, pp. 579-590, Boston, MA (December 1-5, 1986), also available as Lawrence Livermore National Laboratory Report UCRL-94500, December 1986.

- OA-32 Predicting Spent Fuel Oxidation States in a Tuff Repository, R. E. Einziger and R. Woodley, Hanford Engineering Development Laboratory, HEDL-SA-3627, submitted to Lawrence Livermore National Laboratory under subcontract, Workshop on Chemical Reactivity of Oxide Fuel and Fission Product Release, Berkeley, England, April 1987.
- OA-33 Recent Results from NNWSI Spent Fuel Leaching/Dissolution Tests, C. N. Wilson, Westinghouse Hanford Co., HEDL-SA-3700FP, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-21019, April 1987.
- OA-34 Results From Cycles 1 and 2 of NNWSI Series 2 Spent Fuel Dissolution Tests, C. N. Wilson, Westinghouse Hanford Company, HEDL-TME 85-22, submitted to Lawrence Livermore National Laboratory under subcontract, May 1987.
- OA-35 The Influence of Copper Zircaloy Spent Fuel Cladding Degradation Under a Potential Tuff Repository Condition, H. D. Smith, Westinghouse Hanford Co., HEDL-SA-3583, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-15993, May 1987.
- OA-36 NNWSI Waste Form Testing at Argonne National Laboratory Semiannual Report: January-June 1986, J. K. Bates, T. J. Gerding, T. A. Abrajano, and W. L. Ebert, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contract Report UCRL-15801-86-1, July 1987.
- OA-37 Summary of Results from the Series 2 and 3 NNWSI Bare Fuel Dissolution Tests, C. N. Wilson, Westinghouse Hanford Co., Pacific Northwest Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society Symposium Proceedings, Boston, MA (Nov. 30 - Dec. 5, 1987), August 1987.
- OA-38 Thermochemistry of Uranium Compounds, XVI. Calorimetric Determination of the Standard Molar Enthalpy of Formation at 298.25°K. Low-Temperature Heat Capacity, and High-Temperature Enthalpy Increments of  $\text{UO}_2(\text{OH})_2(\text{OH})_2 \cdot \text{H}_2\text{O}$  (Schoepite), I. R. Tasker, P. A. G. O'Hare, B. Lewis, G. Johnson, and E. Cordfunke, Argonne National Laboratory, in The Canadian Journal of Chemistry, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-21055, August 1987.
- OA-39 Electrochemical Corrosion Scoping Experiments--An Evaluation of the Results, H. D. Smith, Westinghouse Hanford Co., WHC-EP-0065 (formerly HEDL-7637), submitted to Lawrence Livermore National Laboratory under subcontract, September 1987.

- OA-40 The Performance of Actinide-Containing SRL-165 Type Glass in Unsaturated Conditions, J. K. Bates and T. J. Gerding, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society Symposium Proceedings, Vol. 112, pp 651-662, Boston, MA (November 30-December 5, 1987), October 1987.
- OA-41 Effect of Ionizing Radiation on Moist Air Systems, D. T. Reed and R. A. Van Konynenburg, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society Symposium Proceedings, Boston, MA (November 30-December 5, 1987) Vol. 112, pp. 393-404, also available as Lawrence Livermore National Laboratory Report UCRL-97936, November 1987.
- OA-42 Initial Report on Stress-Corrosion-Cracking Experiments Using Zircaloy-4 Spent Fuel Cladding C-Rings, H. D. Smith, Westinghouse Hanford Company, WHC-EP-0096 (formerly HEDL-7665), submitted to Lawrence Livermore National Laboratory under subcontract, November 1987.
- OA-43 Corrosion Testing of Type 304L Stainless Steel in Tuff Groundwater Environments, R. Westerman, S. Pitman, and J. Haberman, Pacific Northwest Laboratory, PNL 5829, submitted to Lawrence Livermore National Laboratory under subcontract, also available as Lawrence Livermore National Laboratory Contract Report UCRL-21005, November 1987.
- OA-44 The Reaction of Glass in a Gamma Irradiated Saturated Tuff Environment: Part II. Data Package for ATM-1c and ATM-8 Glass, J. K. Bates, T. J. Gerding, D. F. Fischer, and W. L. Ebert, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor's Report UCRL-15991, November 1987 (No distribution).
- OA-45 Thermochemistry of Uranium Compounds XVII. Standard Molar Enthalpy of Formation at 298.15° K of Dehydrated Schoepite  $\text{UO}_3 \cdot 0.9\text{H}_2\text{O}$ . Thermodynamics of (Schoepite + Dehydrated Schoepite + Water), P. A. G. O'Hare and S. N. Nguyen, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-21053, January 1988.
- OA-46 Measurement of the Oxidation of Spent Fuel Between 140° and 225°C, R. E. Woodley, R. E. Einziger, and H. C. Buchanan, Pacific Northwest Laboratory, PNL-SA-15496, submitted to Lawrence Livermore National Laboratory under subcontract, January 1988.

- OA-47 The Reaction of Glass in a Gamma-Irradiated Saturated Tuff Environment Part III: Long Term Experiments at  $1 \times 10^4$  Rad/hour, T. A. Abrajano, J. K. Bates, T. J. Gerding, and W. L. Ebert, ANL-88-14, Argonne National Laboratory, submitted under subcontract to Lawrence Livermore National Laboratory, February 1988.
- OA-48 Long-Term, Low-Temperature Oxidation of PWR Spent Fuel Interim Transition Report, R. E. Einziger and H. C. Buchanan, WHC-EP-0070, Westinghouse Hanford Company, submitted under subcontract to Lawrence Livermore National Laboratory, February 1988.
- OA-49 NNWSI Waste Form Testing at Argonne National Laboratory Semiannual Report, July-December 1986, J. K. Bates, T. J. Gerding, T. A. Abrajano, W. L. Ebert, and J. J. Mazer, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-15801-86-2, February 1988.
- OA-50 Measurement of the Oxidation of Spent Fuel between  $140^\circ$  and  $225^\circ\text{C}$  by Thermogravimetric Analysis, R. Woodley, R. Einziger, and H. Buchanan, Westinghouse Hanford Co., WHC-EP-0107, submitted to Lawrence Livermore National Laboratory under subcontract, March 1988.
- OA-51 NNWSI Waste Form Testing at Argonne National Laboratory Semiannual Report, January-June 1987, J. K. Bates, T. J. Gerding, A. Abrajano, W. Ebert, and J. Mazer, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-21060-87-1, April 1988.
- OA-52 Americium (III) Carbonate Complexation in Aqueous Perchlorate Solution, H. Nitsche, E. M. Standifer, and R. J. Silva, Lawrence Berkeley Laboratory, LBL-25118, submitted to Lawrence Livermore National Laboratory under subcontract, in *Radiochimica Acta* Journal, Vol. 46, pp. 185-189, (1989), April 1988.
- OA-53 Microstructural Examination of Oxidized Spent PWR Fuel by Transmission Electron Microscope, L. Thomas, R. E. Einziger, and R. E. Woodley, Pacific Northwest Laboratory submitted to Livermore National Laboratory under subcontract, in *Journal of Nuclear Materials* 166 (1989), pp.243-251, also available as PNL-SA-15796, May 1988.
- OA-54 Electrochemical Corrosion Studies on Copper-Base Waste Package Container Materials in Unirradiated 0.1 N  $\text{NaNO}_3$  at  $95^\circ\text{C}$ , M. Akkaya and E. D. Verink with forward by R. A. Van Konynenburg (LLNL), University of Florida, FL, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-281076, May 1988.



- OA-55 Background Studies in Support of a Feasibility Assessment on the Use of Copper-Base Materials for Nuclear Waste Packages in a Repository in Tuff, K. A. Kundig, W. S. Lyman, M. Prager, J. R. Meyers, I. S. Servi, and R. A. Van Konynenburg, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-21082, May 1988.
- OA-56 The Reaction of Reference Commercial Nuclear Waste Glasses During Gamma Irradiation in a Saturated Tuff Environment, J. K. Bates, W. L. Ebert, D. F. Fischer, and T. J. Gerding, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, in *Journal of Materials Research* 3 (3), pp. 576-597, May/June 1988.
- OA-57 The Reaction of Glass During Gamma Irradiation in a Saturated Tuff Environment Part 4: SRL 165, ATM-1c, and ATM-8 Glasses at 1E3 R/h and O R/h, W. L. Ebert, J. K. Bates, and T. J. Gerding, ANL-90/13, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, August 1988.
- OA-58 Application of the NNWSI Unsaturated Test Method to Actinide Doped SRL 165 Type Glass, J. K. Bates and T. J. Gerding, Argonne National Laboratory, ANL-90/24 submitted to Lawrence Livermore National Laboratory under subcontract, July 1988.
- OA-59 An Experimental Investigation of Copper-Zircaloy Interactions Under Potential Tuff Repository Conditions, H. D. Smith, WHC-EP-0173, Pacific Northwest Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-21115, September 1988.
- OA-60 NNWSI Waste Form Testing at Argonne National Laboratory - Semiannual Report, July-December 1987, J. K. Bates, T. J. Gerding, W. L. Ebert, J. J. Mazer, and B. M. Biwer, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Contractor Report UCRL-21060-87-2, October 1988.
- OA-61 Test Plan for Long-Term, Low Temperature Oxidation of BWR Spent Fuel, R. E. Einziger, Pacific Northwest Laboratory, PNL-6427, submitted to Lawrence Livermore National Laboratory under subcontract, December 1988.
- OA-62 Test Plan for Thermogravimetric Analysis of BWR Spent Fuel Oxidation, R. Einziger, Pacific Northwest Laboratory, PNL-6745, submitted to Lawrence Livermore National Laboratory under subcontract, December 1988.

- OA-63 Studies on Spent Fuel Dissolution Behavior under Yucca Mountain Repository Conditions, C. N. Wilson and C. Bruton, Pacific Northwest Laboratory, PNL-SA-16832, submitted to Lawrence Livermore National Laboratory under subcontract, Proceedings of American Ceramic Society Annual Meeting, Indianapolis, IN (April 23-27, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100223, March 1989.
- OA-64 Dissolution and Precipitation Kinetics of Kaolinite: Initial Results at 80°C with Application to Porosity Evolution in a Sandstone, K. L. Nagy, C. I. Steefel, A. E. Blum, and A. C. Lasaga, submitted to Lawrence Livermore National Laboratory under subcontract, AAPG Memoir volume, "Prediction of Reservoir Quality through Chemical Modeling, July 1989.
- OA-65 Results from NNWSI Series 3 Spent Fuel Dissolution Tests, C. N. Wilson, Pacific Northwest Laboratory, PNL-7170, submitted to Lawrence Livermore National Laboratory under subcontract, August 1989.
- OA-66 An Investigation of Thermal Release of 14°C from PWR Spent Fuel Cladding, H. D. Smith and D. Baldwin, Pacific Northwest Laboratory, PNL-SA-16606, submitted to Lawrence Livermore National Laboratory under subcontract, American Nuclear Society, Proceedings Nuclear Waste Isolation in the Unsaturated Zone, Focus '89, pp. 46-49, Las Vegas, (September 17-21, 1989), August 1989.
- OA-67 Spent Fuel Drybath Oxidation Testing, R. E. Einziger, Pacific Northwest Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, American Nuclear Society, Proceedings Nuclear Waste Isolation in the Unsaturated Zone, Focus '89, pp 38-40, Las Vegas, NV (September 17-21, 1989).
- OA-68 Modeling of Zircaloy Cladding Degradation Under Repository Conditions, L. Santanam, H. F. Shaw, and B. A. Chin, University of Auburn, AL, submitted to Lawrence Livermore National Laboratory under subcontract, American Nuclear Society, Proceedings Nuclear Waste Isolation in an Unsaturated Zone, Focus '89, pp. 41-45, Las Vegas, NV (September 17-21, 1989), also available as Lawrence Livermore National Laboratory Report UCRL-100211, September 1989.
- OA-69 Thermodynamic Studies of Zeolites: Clinoptilolite<sup>a</sup>, G. K. Johnson, I. R. Tasker, R. Jurgens, and P. A. G. O'Hare, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, submitted to Journal of Chemical Thermodynamics, September 1989.

- OA-70 Comparison of the Layer Structure of Vapor Phase Leached SRL Glass by Use of AEM, B. M. Biwer, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society, Proceedings Scientific Basis for Nuclear Waste Management XIII, Vol. 176, pp. 255-263, Boston, MA, (November 27-30, 1989), October 1989.
- OA-71 The Reaction of Synthetic Nuclear Waste Glass in Steam and Hydrothermal Solution, W. L. Ebert and J. K. Bates, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society, Proceedings Scientific Basis for Nuclear Waste Management XIII, Vol. 176, pp. 339-346, Boston, MA (November 27-30, 1989), October 1989.
- OA-72 Parametric Effects of Glass Reaction Under Unsaturated Conditions, J. K. Bates, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society, Proceedings Scientific Basis for Nuclear Waste Management XIII, Vol. 176, pp. 347-354, Boston, MA, (November 27-30, 1989), October 1989.
- OA-73 Corrosion Product Identification and Relative Rates of Corrosion of Candidate Metals in an Irradiated Air-Steam Environment, D. T. Reed, V. Swayambunathan, and R. A. Van Konynenburg, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Materials Research Society, Proceedings Scientific Basis for Nuclear Waste Management XIII, Vol. 176, pp. 517-524, Boston, MA (November 27-30, 1989), also available as Lawrence Livermore National Laboratory UCRL-102597.
- OA-74 Vapor Hydration and Subsequent Leaching of Transuranic-Containing SRL and WV Glasses, J. K. Bates, W. L. Ebert, and T. J. Gerding, Argonne National Laboratory, submitted to Lawrence Livermore National Laboratory under subcontract, Proceedings International High Level Radioactive Waste Management, Vol. 2, pp. 1095-1102, Las Vegas, Nevada (April 8-12, 1990), December 1989.
- OA-75 Effects of Water Composition on the Dissolution Rate of  $\text{UO}_2$  Under Oxidizing Conditions, C. N. Wilson and W. J. Gray, Pacific Northwest Laboratory, PNL-SA-17574, submitted to Lawrence Livermore National Laboratory under subcontract, Proceedings International High Level Radioactive Waste Management Conference, Vol. 2, pp. 1431-1436, Las Vegas, Nevada (April 8-12, 1990), December 1989.

**LAWRENCE LIVERMORE NATIONAL LABORATORY  
YUCCA MOUNTAIN PROJECT  
LISTING BY AUTHOR**

Abrajano, T. A.:	OA-23, OA-26, OA-30, OA-36, OA-47, OA-49, OA-51
Acton, C.:	93
Aines, R.:	85, 88, 101, 105, 106, 118, 183
Akkaya, M.:	OA-54
Alexrod, M. C.:	86
Atanasoski, R. T.:	104
Baldwin, D.:	OA-66
Ballou, L. B.:	3, 16, 19, 22, 170
Bates, J. K.:	42, 99, 101, 105, OA-9, OA-11, OA-13, OA-21, OA-23, OA-26, OA-29, OA-30, OA-36, OA-40, OA-44, OA-47, OA-49, OA-51, OA-56, OA-57, OA-58, OA-60, OA-71, OA-72, OA-74
Bazan, F.:	49, 52, 91, 106
Beatty, J.:	168
Beiriger, J.:	30, 35
Beiriger, W.:	61, 70, 113
Bell, B. T.:	104
Bibler, N.:	41
Biwer, B. M.:	OA-60, OA-70
Blum, A. E.:	OA-64
Bourcier, W. L.:	57, 92, 134, 155, 164, 165, 177, 178, 183
Bruton, C.:	123, 124, 165, 183, OA-63
Buchanan, H. C.:	OA-46, OA-48, OA-50
Buettner, H. M.:	174
Bullen, D. B.:	120, 139, 140, 141, 144, 145, 146
Buckholtz-ten Brink, M.:	150

Buscheck, T. A.:	72, 119, 136, 152, 162, 168, 173, 186
Butkovich, T. R.:	83
Byerlee, J. D.:	55, OA-1, OA-3, OA-5, OA-19
Capo, M. A.:	20
Carlson, R.:	168, 186
Chin, B. A.:	OA-68
Clarke, W. L.:	187
Clinnick, M.:	134
Cordfunke, E.:	OA-38
Culham, H. W.:	44, 96
Daily, W. D.:	39, 46, 50, 68, 72, 74, 107, 110, 111, 133, 167, 168, 174, 176, 186
Day, R. A.:	126
Delany, J. M.:	30, 47, 48, 71, 89, 92, 134, 165
Domian, H. A.:	159, 181
Drach, R.:	95
Dronkers, J. J.:	82
Ebert, W. L.:	99, OA-23, OA-26, OA-36, OA-44, OA-47, OA-49, OA-51, OA-56, OA-57, OA-60, OA-71, OA-74
Eggert, K.:	97
Einziger, R. E.:	175, OA-12, OA-14, OA-17, OA-20, OA-27, OA-32, OA- 46, OA-48, OA-50, OA-53, OA-61, OA-62, OA-67
Emerson, D.:	92
Farmer, J. C.:	138, 141, 142, 143, 145, 151, 154, 187
Fischer, D. F.:	OA-21, OA-44, OA-56
Fox, M. J.:	21

Garrison, R. E.:	33, 43
Gerding, T. J.:	99, OA-9, OA-11, OA-13, OA-21, OA-23, OA-26, OA-29, OA-36, OA-40, OA-44, OA-47, OA-49, OA-51, OA-56, OA-57, OA-58, OA-60, OA-74
Gdowski, G. E.:	120, 139, 140, 142, 143, 144, 146
Goodman, R.:	69
Glass, R. S.:	33, 51, 66, 104, OA-31
Glassley, W.:	94, 130, 158
Gray, W. J.:	OA-75
Gregg, D. W.:	4, 9, 22, 40
Haberman, J.:	OA-43
Halsey, W. G.:	127, 132, 179, 187
Hertel, G.:	161
Hockman, J. N.:	4, 23, 28, 40
Isherwood, D. J.:	27, 29, 47, 59
Jackson, K. J.:	47, 92, 134, 165, 183
Jardine, L. J.:	182, 185
Johnson, G. L.:	149, 161
Johnson, G. K.:	OA-38, OA-69
Juhas, M. C.:	17, 43
Jurgens, R.:	OA-69
Kass, J. N.:	138, 163
Knapp, R.:	125, 166
Knauss, K. G.:	8, 10, 14, 25, 30, 32, 35, 61, 70, 98, 103, 113, 117, 164, 165, 177, 178
Kundig, K. A.:	OA-55

LaCount, D. F.:	159, 181
LaMonica, L.:	161
Lanford, R.:	101
Lappa, D.:	97, 156
Lasaga, A.:	OA-64
Latorre, V. R.:	168, 169, 174, 176, 186,
Lee, K.:	168, 186
Lewis, B.:	OA-38
Lin, W.:	39, 68, 72, 133, 167, 168, 171, 186
Logan, R. W.:	17
Lundeen, S.:	134
Lyman, W. S.:	OA-55
Ma, C. W.:	182
Mao, N.:	168, 186
Mazer, J. J.:	OA-49, OA-51, OA-60
Merzbacher, C. I.:	164, 177
Meyers, J. R.:	OA-55
McCright, R. D.:	11, 13, 16, 17, 21, 33, 38, 43, 45, 51, 54, 60, 65, 93, 120, 127, 132, 138, 141, 142, 143, 148, 151, 154
McKeegan, K. D.:	150, 177, 178, 187
McKenzie, W. F.:	92, 188
McVay, G. L.:	OA-6
Montan, D. N.:	77, 84, 108, 112
Moore, D. E.:	55, , OA-1, OA-3, OA-5, OA-19
Moore, R.:	134
Morissette, R.:	161
Morrow, C. A.:	55, OA-1, OA-3, OA-5, OA-19

Nagy, K. L.:	OA-64
Nelson, T. A.:	131, 159, 160, 161, 181
Nguyen, S. N.:	116, 177, OA-45
Nitao, J. J.:	119, 135, 136, 147, 152, 162, 168, 172, 173, 190
Nitsche, H.:	OA-52
O'Connell, W. J.:	95, 97, 156, 184
O'Hare, P. A. G.:	OA-38, OA-45, OA-69
O'Neal, W. C.:	4, 9, 11, 13, 20, 22, 23, 28, 40
Otto, C. H.:	44
Oversby, V. M.:	1, 8, 14, 15, 18, 24, 26, 31, 34, 36, 41, 42, 45, 53, 56, 63, 67, 76, 101, 102, 114, 128, 150
Overturf, G. E.:	33, 51, 66
Patrick, W. C.:	7, 86
Peifer, D. W.:	30, 61, 70, 98, 113, 178
Phinney, D.:	101, 150
Pitman, S.:	OA-43
Piwinskii, A.:	70
Prager, M.:	OA-55
Puigdomenech, I.:	47, 89
Ramirez, A. L.:	46, 50, 74, 107, 110, 111, 168, 176, 186
Ramspott, L. D.:	137
Rard, J. A.:	121, 157, 189
Rector, N. L.:	7
Reed, D. T.:	OA-41, OA-73
Rego, J. H. :	49, 52, 91, 106



Revelli, M. A.:	4
Robinson, G. R.:	OA-6
Robitz, E. S.:	159, 181
Rothman, A. J.:	2, 4, 37
Russell, E. W.:	4, 11, 13, 22, 40, 131, 159, 160, 161, 181
Ryerson, R. J.:	101, 177
Santanam, L.:	OA-68
Schornhorst, J. R.:	4
Schuraytz, B. C.:	90
Servi, I. S.:	OA-55
Shaw, H.:	100, 122, 123, 128, 175, OA-68
Silva, R.J.:	92, 116, OA-52
Smyrl, W. H.:	104
Smith, C. F.:	44, 96
Smith, D. K.:	150, 177, 178
Smith, H. D.:	63, 96, OA-8, OA-10, OA-18, OA-22, OA-24, OA-35, OA-39, OA-42, OA-59, OA-66
Stager, R.:	78
Stahl, D.:	161
Standifer, E.:	OA-52
Steefel, C. I.:	OA-64
Stein, K. O.:	159, 181
Stein, W.:	28, 40
Stout, R. B.:	175, 180
Strum, M. J.:	145
Sutcliffe, W. G.:	12
Swayambunathan, V.:	OA-73

Tasker, I. R.:	OA-38, OA-69
Thatcher, R.:	156
Thomas, L.:	OA-53
Towse, D.:	168, 186
Ueng, T. S.:	168, 176, 186
Van Konynenburg, R. A.:	16, 44, 51, 54, 60, 66, 87, 96, 99, 127, 141, 142, 143, OA-41, OA-54, OA-55, OA-73
Verink, E. D.:	OA-54
Verrill, S. P.:	86
Viani, B.:	129, 165, 183
Vogel, T.:	90
Watwood, D.:	168, 186
Weed, H. C.:	105, 116, 177
Weiss, H.:	17, 38, 60, 145, 146
Weren, B. H.:	20
Westerman, R.:	OA-43
Wicks, G.:	41
Wijesinghe, A. M.:	75
Wilder, D. G.:	6, 73, 80, 109, 153, 168
Wilson, C. N.:	24, 53, 67, 100, OA-4, OA-7, OA-15, OA-16, OA-25, OA-33, OA-34, OA-37, OA-63, OA-65, OA-75
Wolery, T. J.:	5, 14, 27, 29, 47, 48, 81, 89, 92, 117, 134, 165
Woodley, R. E.:	OA-2, OA-12, OA-14, OA-20, OA-32, OA-46, OA-50, OA-53
Younker, L.:	90
Yow, J. L.:	6, 58, 62, 64, 69, 73, 79, 83, 86, 115
Yunker, W.:	OA-28, OA-31

**LAWRENCE LIVERMORE NATIONAL LABORATORY  
YUCCA MOUNTAIN PROJECT  
LISTING BY SUBJECT**

**PROJECT OVERVIEW**

2, 3, 19, 22, 137, 170, 182

**CONTAINER MATERIALS MODELING AND TESTING**

11, 13, 16, 17, 21, 33, 37, 38, 40, 43, 44, 45, 51, 54, 60, 65, 66, 87, 93, 96, 104, 120, 126, 127, 132, 138, 139, 140, 141, 142, 143, 144, 145, 146, 148, 149, 151, 154, 159, 160, 161, 163, 179, 181, 187, OA-28, OA-31, OA-43, OA-54, OA-55, OA-73

**GEOCHEMICAL MODELING**

5, 27, 29, 47, 48, 57, 59, 81, 82, 88, 89, 92, 121, 123, 129, 134, 155, 157, 165, 183, 189, OA-52

**NEAR-FIELD ENVIRONMENT MODELING AND TESTING**

6, 7, 8, 10, 14, 25, 30, 31, 32, 34, 35, 39, 46, 50, 55, 56, 58, 61, 62, 64, 68, 69, 70, 71, 72, 73, 74, 75, 78, 79, 80, 83, 84, 86, 90, 91, 94, 98, 103, 107, 109, 110, 111, 112, 113, 115, 117, 119, 125, 130, 133, 135, 136, 147, 152, 153, 158, 162, 166, 167, 168, 169, 171, 172, 173, 174, 176, 186, 190, OA-1, OA-3, OA-5, OA-19, OA-52, OA-64, OA-69

**PERFORMANCE ASSESSMENT**

12, 45, 76, 95, 97, 137, 156, 184, 185

**SPECIAL STUDIES**

4, 9, 23, 28, 77, 108, 131

**WASTE FORM MODELING AND TESTING**

1, 15, 18, 20, 24, 26, 36, 37, 41, 42, 45, 49, 52, 53, 63, 67, 76, 85, 99, 100, 101, 102, 105, 106, 114, 116, 118, 122, 124, 128, 150, 164, 175, 177, 178, 180, 188, OA-2, OA-4, OA-6, OA-7, OA-8, OA-9, OA-10, OA-11, OA-12, OA-13, OA-14, OA-15, OA-16, OA-17, OA-18, OA-20, OA-21, OA-22, OA-23, OA-24, OA-25, OA-26, OA-27, OA-29, OA-30, OA-32, OA-33, OA-34, OA-35, OA-36, OA-37, OA-38, OA-39, OA-40, OA-41, OA-42, OA-44, OA-45, OA-46, OA-47, OA-48, OA-49, OA-50, OA-51, OA-53, OA-56, OA-57, OA-58, OA-59, OA-60, OA-61, OA-62, OA-63, OA-65, OA-66, OA-67, OA-68, OA-70, OA-71, OA-72, OA-74, OA-75