

# **International High-Level Radioactive Waste Management Conference (IHLRWM 2022)**

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Volume 1 of 2

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- 714 Structural Properties of Organically Modified Aluminum Oxyhydroxide Nanomaterials from Molecular Simulation—*Jeffery A. Greathouse (Sandia), Philippe F. Weck (Sandia), Edward N. Matteo (Sandia)*

## 719 Advanced Monitoring and Characterization: I

- 720 Numerical Investigation of the Helium/Air Ratio Effects on Acoustic Wave Transmission—*Luyu Bo (Mississippi State), Jiali Li (Mississippi State), Teng Li (Mississippi State), Zhenhua Tian (Virginia Polytechnic Institute and State University)*
- 723 Experimental Study of Ultrasonic Crosstalk Cancellation on SNF Canister Mock-up—*Bozhou Zhuang (Univ. Southern California), Bora Gencturk (Univ. Southern California), Iman Asareh (Univ. Southern California), Assad Oberai (Univ. Southern California), Ryan Meyer (PNNL)*
- 733 Computational Modeling in Support of Non-Invasive Water Detection in Dry Storage Casks—*Ryan M. Meyer (PNNL), Morris S. Good (PNNL), Chen Zhang (PNNL), Naveen Karri (PNNL)*

## 739 Thursday, November 17

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### 741 Transportation: II

- 742 Updated San Onofre Nuclear Power Plant Site Evaluation—*Steven Maheras (PNNL), Erica Bickford (U.S. Dept. of Energy), Matthew Feldman (PNNL), Rebecca Kreuzer (PNNL)*
- 752 A Database for Type B Package Transportation Incidents—*Kevin J. Connolly (ORNL), Ingrid K. Busch (ORNL)*
- 758 Reactivating RISKIND to Support Transportation Risk Analyses—*David J. LePoire (ANL), Margaret M. MacDonell (ANL), Milos I. Atz (ANL), Steven J. Maheras (PNNL), Matthew R. Feldman (PNNL)*

- 764 3D Metrology Analysis of Structural Damages on Type B Shipping Container After Completion of Normal Conditions of Transportation and Hypothetical Accident Conditions Regulatory Testing—*Abiodun Adeniyi (ORNL), Oscar Martinez (ORNL), Paul Nogradi (ORNL), Ross Wittenbarger (Y-12 Nat'l Security Complex), Ryan Fisher (Y-12 Nat'l Security Complex), Austin Mclaurine (Y-12 Nat'l Security Complex)*
- 767 Updated Draft Railcar Safety Inspection Protocol for Shipments of Spent Nuclear Fuel—*Steven Maheras (PNNL), Erica Bickford (U.S. Dept. of Energy)*

### 775 Disposal: X

- 776 Geologic Disposal Safety Assessment (GDSA) Biosphere Model Development—*Caitlin Condon (PNNL), Saikat Ghosh (PNNL), Bruce Napier (PNNL), Glenn Hammond (PNNL), Harish Gadey (PNNL)*
- 780 Draft Recommendations for New Generic Repository Environmental Standards for the United States—*Peter Swift (Consulting Scientist), Michael Apted (INTERA), Lake Barrett (Lake Barrett Consulting), John Kessler (J Kessler and Assoc.), Steven Nesbit (LMNT Consulting)*
- 787 International Perspectives on Safety Regulations for Geological Disposal of High-Level Waste—*Michael Apted (INTERA), Lake Barrett (Lake Barrett Consulting), John Kessler (J Kessler and Assoc.), Steven Nesbit (LMNT Consulting), Peter Swift (Consultant)*
- 796 Characteristics of Future Human Society Assumed in Geologic Repository Standards—*Steven P. Nesbit (LMNT Consulting), Michael Apted (INTERA), Lake Barrett (Lake Barrett Consulting), John Kessler (J Kessler and Assoc.), Peter Swift (Consulting Scientist)*

### 801 Advanced Monitoring and Characterization: II

- 802 Using Cosmic Ray Muons to Assess Geological Characteristics in the Subsurface—*H.R. Gadey (PNNL), R. Howard (PNNL), S.C. Tognini (ORNL), J.L. Meszaros (ORNL), R. Montgomery (ORNL), S. Chatzidakis (Purdue), J. Bae (Purdue), R. Clark (U.S. Dept. of Energy)*
- 807 Frequency Response Function Based Damage Detection of Spent Nuclear Fuel Canisters—*Mehrdad Aghagholizadeh (Univ. Southern California), Bora Gencturk (Univ. Southern California), Roger Ghanem (Univ. Southern California), Anna Arcaro (Univ. Southern California)*

- 816 Fusion of Distributed Fiber Optics, Acoustic NDE for Spent Fuel Monitoring Towards Physics-Informed Machine Learning—*Pengdi Zhang (Univ. Pittsburgh), Abhishek Venketeswaran (National Energy Technology Laboratory), Ruishu F. Wright (National Energy Technology Laboratory), Ryan M. Meyer (PNNL), Paul R. Ohodnicki (Univ. Pittsburgh)*
- 828 Monitoring Spent Nuclear Fuel in a Dry Cask Using Momentum Integrated Muon Scattering Tomography—*Junghyun Bae (Purdue), Stylianos Chatzidakis (Purdue)*
- 833 Remote Area Modular Monitoring for Nuclear Facilities—*B. Craig (ANL), K. Byrne (ANL), Y.Y. Liu (ANL), M. Hoover (Embedded Planet)*
- 839 Site Selection/Characterization/Integration: IV**
- 840 A Social Science Research Plan for the Initial Phases of Consent-Based Siting—*Sharlissa Moore (PNNL), Geoff Whittle-Walls (PNNL), Ellen Kennedy (PNNL), Ennea Fairchild-Grant (PNNL)*
- 844 Overview of System Integration Analysis Activities for Integrated Waste Management—*R.A. Joseph III (INL), G.M. Petersen (INL), K. Banerjee (PNNL), B. Craig (ANL)*
- 848 Current Progress on the Development of the Integrated Waste Management Consent Based Siting Process in the U.S.—*J. Uribe (U. S. Dept. of Energy), N. Saraeva (PNNL), R. Kreuzer (PNNL), K. Petry (U.S. Dept. of Energy), E. Bickford (U.S. Dept. of Energy), A. Trunzo (U.S. Dept. of Energy), R. Howard (PNNL)*
- 851 Consent-Based Siting of Spent Fuel Facilities: Evidence From Nationwide US Surveys—*Kuhika Gupta (Univ. Oklahoma), Ross Buchanan (Univ. Oklahoma), Hank Jenkins-Smith (Univ. Oklahoma)*
- 857 Influence of Mineral Alteration Intensity of Hiltaba Granite and its Vertical Distribution on Physicochemical Containment for Borehole Disposal of Intermediate Level Waste in Australia—*Lionel Esteban (CSIRO), David N. Dewhurst (CSIRO), Seyi Philemon Akanji (CSIRO), Joel Sarout (CSIRO), Matthew Josh (CSIRO), Cornelia Wilske (CSIRO), Punjehl Crane (CSIRO), Ausama Giwelli (CSIRO), Dirk Mallants (CSIRO)*
- 863 Storage: VIII**
- 864 Maximum Heat Load Configuration for NUHOMS® DSCs—*Venkata Venigalla (Orano TN), Hui Liu (Orano TN)*
- 867 Corrosion Resistant Coatings for Application on Spent Nuclear Fuel Canisters—*B. Nation (Sandia), A. Knight (Sandia), R. Schaller (Sandia), C. Bryan (Sandia)*
- 874 Thermal Modeling of Hanford Lead Canister's Heated Canister Test—*Sarah R. Suffield (PNNL), Christopher L. Grant (PNNL), Nicholas A. Klymyshyn (PNNL)*
- 879 Decay Heat Measurements and Analysis for BWR Fuel with Shorter Cooling Time—*Henrik Liljenfeldt (Noemi Analytics), Hatice Akkurt (EPRI), Robert Hall (EPRI), Fredrik Johansson (Swedish Nuclear Fuel & Waste Management Co.), Jesper Kierkegaard (Vattenfall Nuclear Fuel)*
- 883 Pretest Analysis of Spent Nuclear Fuel in a Seismic Shake Table Test—*Nicholas Klymyshyn (PNNL), Kevin Kadooka (PNNL), Taylor Mason (PNNL), Casey Spitz (PNNL), Pavlo Ivanusa (PNNL), James Fitzpatrick (PNNL)*
- 889 Disposal: XI**
- 890 Advancements in High-Performance Multi-Physics Simulation Capabilities for the Geologic Disposal Safety Assessment Framework—*Michael Nole (Sandia), David Fukuyama (Sandia), Rosie Leone (Sandia), Heeho Park (Sandia), Matthew Paul (Sandia), Alex Salazar (Sandia)*
- 895 Development of a Fully Implicit Flow and Solute Transport Model in PFLOTRAN—*David Fukuyama (Sandia), Michael Nole (Sandia)*
- 900 Characteristics of a Steel/Clay Model System Under Repository Conditions—*Margit Fabian (Centre for Energy Research), Istvan Tolnai (Centre for Energy Research), Otto Czompoly (Centre for Energy Research), Janos Osan (Centre for Energy Research), Elod Laszlo Aradi (Eötvös Loránd Univ.)*
- 906 Model Development of Coupled THMC Processes for a Geological Repository at Higher Temperature Region—*Yusaku Takubo (Nuclear Waste Mgmt. Org. Japan), Yusuke Takayama (Japan Atomic Energy Agency), Andres Idiart (AMPHOS 21 Consulting), Tatsuya Tanaka (Obayashi Corp.), Keisuke Ishida (Nuclear Waste Mgmt. Org. Japan), Kiyoshi Fujisaki (Nuclear Waste Mgmt. Org. Japan)*
- 916 Model Development for THM Simulations of a Full-Scale Heater Emplacement in Opalinus Clay—*Teklu Hadgu (Sandia), Thomas Dewers (Sandia), Edward Matteo (Sandia)*
- 921 Storage: IX**
- 922 Validation of UNF-ST&DARDS As-Loaded Analysis Methods for Spent Nuclear Fuel Analysis—*J.B. Clarity (PNNL), K. Banerjee (PNNL), P. Miller (PNNL), W.J. Marshall (ORNL), H. Liljenfeldt (Noemi Analytics), A.M. Shaw (ORNL)*
- 928 i-LAMP: Industrywide Learning Aging Management Program for Global Monitoring of Spent Fuel Pools—*Hatice Akkurt (EPRI)*
- 933 Ageing Management Programs for Spent Fuel Dry Storage Systems—*Y.Y. Liu (ANL), C. Gastl (IAEA)*

938 Hanford Lead Canister Weld Residual Stress and Coupon Placement—*Ben J. Jensen (PNNL), Nicholas A. Klymyshyn (PNNL), Kenneth A. Ross (PNNL)*

#### 945 Disposal: XII

946 Machine Learning Surrogate Process Models for Efficient Performance Assessment of a Nuclear Waste Repository—*Bert J. Debusschere (Sandia), D. Thomas Seidl (Sandia), Timothy M. Berg (Sandia), Kyung Won Chang (Sandia), Rosemary C. Leone (Sandia), Laura P. Swiler (Sandia), Paul E. Mariner (Sandia)*

953 Studying the Bentonite Buffer for HLW Geological Disposal: Large Scale Field Tests and the Corresponding Modeling—*Liange Zheng (LBNL), Sangcheol Yoon (LBNL), Jonny Rutqvist (LBNL), Jens Birkholzer (LBNL)*

960 Experimental Study of Bentonite Buffer for Geologic Disposal of High-Level Radioactive Waste—*Chun Chang (LBNL), Sharon Borglin (LBNL), Chunwei Chou (LBNL), LianGe Zheng (LBNL), Yuxin Wu (LBNL), Timothy J. Kneafsey (LBNL), Seiji Nakagawa (LBNL), Jens T. Birkholzer (LBNL)*

966 Coupled Thermo-Hydro-Mechanical Modeling for a High Temperature Heating and Hydration Column Experiment—*Sangcheol Yoon (LBNL), Sharon Borglin (LBNL), Chun Chang (LBNL), Chunwei Chou (LBNL), Liange Zheng (LBNL), Yuxin Wu (LBNL)*

974 1-D Multiphase Simulation of Bentonite Saturation Using PFLOTRAN: Preliminary Results—*Carlos F. Jové Colón (Sandia), Carlos M. Lopez (Sandia), Kristopher L. Kuhlman (Sandia)*

#### 981 Disposal: XIII

982 Geoscientific Investigations Underpinning the Safety Assessment of Deep Borehole Disposal—*Dirk Mallants (CSIRO), Julien Bourdet (CSIRO), Michael Camilleri (CSIRO), Punjeh Crane (CSIRO), Claudio Delle Piane (CSIRO), Alec Deslandes (CSIRO), Dave Dewhurst (CSIRO), Christian Doblin (CSIRO), Hans-Joachim Engelhardt (BGE-Technology), Lionel Esteban (CSIRO), Ema Frery (CSIRO), Christoph Gerber (CSIRO), Matthew Josh (CSIRO), Uli Kelka (CSIRO), Manoj Khanal (CSIRO), Laurent Langhi (CSIRO), Kaveh Sookhak Lari (CSIRO), Thomas Poulet (CSIRO), Matthias Raiber (CSIRO), Regina Sander (CSIRO), Mustafa Sari (CSIRO), Joel Sarout (CSIRO), Peter Schaub (CSIRO), Heather Sheldon (CSIRO), Baotang Shen (CSIRO), Jingyu Shi (CSIRO), Julian Strand (CSIRO), Axel Suckow (CSIRO), Tilman Fisher (BGE-Technology), Cornelia Wilske (CSIRO), Junfang Zhang (CSIRO)*

988 The Role of Environmental Tracers for Underpinning the Safety of Deep Borehole Disposal—*Axel Suckow (CSIRO), Dirk Mallants (CSIRO), Christoph Gerber (CSIRO), Cornelia Wilske (CSIRO)*

995 Towards the Safety Cases for Deep-Vertical Borehole Disposal of High-Level Waste: A Modelling Study—*Karl P. Travis (Univ. Sheffield), Charles Lord (Univ. Sheffield), Luke Golding (Univ. Sheffield), Adam Squires (Univ. Sheffield), Fergus G.F. Gibb (Univ. Sheffield), David Burley (Univ. Sheffield)*

1002 Progress Toward a Deep Borehole Field Test—*Geoff Freeze (Sandia), John Phalen (CSIRO), Dirk Mallants (CSIRO), David Sassani (Sandia)*

**1007 Cool New Reactors Coming to You Soon! But What about the Waste?**

**1009 Appendix: Workshops**