

NEVADA'S SCIENTIFIC EXPERTS

- ❖ Nevada has engaged a world-class team of eminent scientists to assist the state in its challenge to the Yucca Mountain nuclear waste repository before the U.S. Nuclear Regulatory Commission ("NRC") in license proceedings. These scientists, working with Nevada's attorneys, will sponsor expert testimony and assist with the evaluation of testimony by the Department of Energy and NRC Staff.
- ❖ Nevada's experts cover the entire range of scientific disciplines necessary to demonstrate that the Yucca Mountain repository is unsafe and should not be licensed.
- ❖ Nevada expects to add additional experts in other areas important to the Yucca Mountain licensing proceeding.

CLIMATOLOGY

- **Dr. Johnathan Overpeck** is Director of the Institute for the Study of Planet Earth and Professor of Geosciences at the University of Arizona. He holds a Ph.D. in geosciences from Brown University and has published numerous papers and books on climate change. He is especially experienced in the climatology of the western United States.

HYDROLOGY

- **Linda L. Lehman** is a licensed professional hydrogeologist and President of the Technical & Regulatory Evaluations Group, Inc. She has spent years studying the hydrology of Yucca Mountain, including intensive studies of its saturated zone. She has assisted the U.S. Environmental Protection Agency in the development of compliance criteria for the WIPP nuclear waste repository in New Mexico, and earlier in her career she was a hydrologist for the NRC. As a private consultant, she has been involved in hydrologic studies of the Energy Department's Hanford nuclear site in Washington, and has provided expert testimony in litigation concerning DOE's Fernald, Portsmouth, and Rocky Flats sites, uranium mill tailings disposal sites, uranium processing facilities, and various Superfund sites. She has served as an advisor to the National Academy of Science and numerous other governmental bodies on hydrogeologic issues.

- **Dr. Adrian P. Butler** holds a Ph.D. in Groundwater Hydrology from Imperial College in London, where he currently teaches, and is Chairman of the British Hydrological Society (Southern Section). He has published dozens of peer-reviewed papers on the migration of contaminants through subsurface media, and has been involved in radioactive waste disposal studies for the nuclear industry. He is a Fellow of the Royal Meteorological Society.
- **Dr. Howard S. Wheeler** is Professor of Hydrology at Imperial College in London, and is a Fellow in the Royal Academy of Engineering and the Institution of Civil Engineers. He has performed hydrologic studies for the U.K.'s high-level nuclear waste repository program, and is past president of the British Hydrological Society. He has also conducted hydrologic studies in Brazil, Spain, Yemen, Japan, China, UAE, and Botswana.

GEOCHEMISTRY

- **Dr. Don L. Shettel** has been studying Yucca Mountain's geochemistry and mineralogy for over a decade. He holds a Ph.D. in Geochemistry and Mineralogy from Penn State, and has been a field geochemist for numerous industrial and governmental clients.
- **Dr. Adrian Bath** is a world-renowned hydro-geochemist who holds a Ph.D. in Isotope Geochemistry from Oxford. He has been a geochemist for the British Geological Survey, and an expert advisor for the International Atomic Energy Agency and for various industry groups. He is currently a lead advisor to the Swedish government on the geochemistry and hydrogeologic issues for the Swedish high-level nuclear waste repository program, and has also worked on the German nuclear waste disposal program. He is a Fellow in the U.K Geological Society, and has authored over 160 publications.
- **Dr. Brenda J. Little** is Senior Scientist for Marine Molecular Processes at the U.S. Naval Research Laboratory in Stennis, Mississippi. She holds a Ph.D. in Chemistry from Tulane University, and is one of the world's leading experts in the field of microbial induced corrosion. She has spent several years studying the capacity of microorganisms in Yucca Mountain's "near-field" environment to induce corrosion of waste packages.

- **Dr. James D. Rimstidt** is Professor of Geochemistry at Virginia Tech, where he has specialized in the study of aqueous geochemistry and geochemical kinetics. He holds a Ph.D. in Geochemistry from Penn State, and has authored several books and a multitude of papers on geochemistry.

GEOLOGY

- **Dr. Maurice E. Morgenstein** is one of the world's leading geologists with broad expertise as well in geochemistry, mineralogy, geophysics, corrosion studies, and archeology. He is an eminent geo-archeologist, participating in some of the most famous digs in Egypt and elsewhere, and is currently a Visiting Scholar at the Archeological Research Facility at the University of California at Berkeley. He has spent nearly 20 years studying Yucca Mountain, particularly the anticipated "near field" environment surrounding that part of the repository that will house nuclear waste. He has led a team of eight other experts that have analyzed in detail that environment's potential to induce corrosion of waste packages.

CORROSION SCIENCE

- **Dr. Roger W. Staehle** is considered by many to be the leading expert in the world on corrosion, and is frequently referred to as "Mr. Corrosion." Most recently, he served as a consultant to the Columbia Investigative Board that evaluated the accident of the Space Shuttle Columbia. He holds a Ph.D. in Metallurgical Engineering from Ohio State University, and is the former Dean of the Institute of Technology at the University of Minnesota. He is a member of the National Academy of Engineering, and has won numerous awards for his work on corrosion. He has published 22 books and hundreds of papers on the subject. He has consulted for the NRC, the Electric Power Research Institute, dozens of nuclear utilities and nuclear research laboratories, and many national governments.
- **Dr. Aaron Barkatt** is a leading authority on the chemistry of waste package corrosion and on radiation chemistry. Currently Director of the Oxide Chemistry Group at Catholic University of America, he has done numerous in-depth studies of waste package corrosion for such entities as Duratek Corporation, NPD Nuclear Systems, Purdue University, and the Department of Energy. He has spent years studying the near-field chemistry of the repository

zone at Yucca Mountain, and its effects on waste packages and vitrified waste logs.

- **Dr. April L. Pulvirenti** holds a Ph.D. in Inorganic Chemistry from Purdue. She is presently the lead laboratory researcher for Nevada's team of experts studying the corrosion of Alloy-22 and Titanium-7, materials the Energy Department intends to use for Yucca Mountain's waste packages and its "drip shields." She presently holds a post-doctoral assignment with Dr. Barkatt at Catholic University, where her experiments are being conducted. She has presented numerous peer-reviewed papers of her Yucca studies.
- **Dr. Jeffrey A. Gorman** holds a Ph.D. in Engineering Science from CalTech. He is the leading water chemistry and corrosion expert for Reston, Virginia-based Dominion Engineering. Mr. Gorman has conducted numerous studies regarding nuclear and fossil power plants, for utilities worldwide as well as the Navy, the Department of Energy, and the Electric Power Research Institute.
- **Dr. Charles E. Marks** is a water chemistry expert for Dominion Engineering. He holds a Ph.D. in Chemical Engineering from University of Maryland, and has performed in-depth research into the corrosive effects of nuclear steam generator deposits. Mr. Marks has done extensive field studies in thermo-mechanical modeling, chemical kinetics, corrosion, and electrochemistry.

RADIONUCLIDE MIGRATION AND TRANSPORT

- **Dr. David A. Lever** is an internationally recognized expert in radioactive waste disposal and transport modeling. His company, Serco Assurance, is one of the leading entities in the world in the field of radioactive waste management. Dr. Lever managed the Nirex Safety Assessment Research Program in the U.K. for many years for the British repository program. He has been as member of an international peer review team established by the OECD's Nuclear Energy Agency to review the Belgian waste disposal program and various proposals submitted to the European Commission for member states. He holds a Ph.D. in Applied Mathematics from Cambridge University.
- **Dr. C. Peter Jackson** is an applied mathematician at Serco Assurance specializing in the groundwater flow and transport modeling for radioactive waste repositories and waste disposal facilities. He holds a Ph.D. in

Mathematics from Cambridge University, and played a pivotal role in assessments for the U.K.'s Nirex deep repository for intermediate-level radioactive wastes. Prior to joining Serco Assurance, he was Chief Hydrogeologist for AEA Technology, and was Senior Scientific Officer at the U.K. Atomic Energy Authority.

- **Dr. Andrew J. Baker** is an expert in safety assessment for nuclear facilities with Serco Assurance. He has worked on national repository projects in Australia, Britain, Bulgaria, Scotland, Lithuania, Russia, Hungary, and Slovakia. Prior to working with Serco Assurance, he was a Scientist with AEA Technology in Britain, and was a Scientific Administrator for the U.K. Natural Environment Research Council. He holds a Ph.D. in Earth Sciences from Oxford University.

TOTAL SYSTEM PERFORMANCE ASSESSMENT & BIOSPHERE STUDIES

- **Dr. Michael C. Thorne** is a world-recognized expert in the use of total system performance assessment in the evaluation of waste and repository sites. He holds a Ph.D. in Theoretical Physics from the University of Sheffield, England, and is a past Secretary of the International Commission on Radiological Protection (ICRP), where he led detailed international studies on the health effects of radiation. He has done extensive consulting work in connection with the British, French, and Swedish high-level nuclear waste repository programs, and has also done studies on the effects of the Chernobyl accident for the British Government, low-level radioactive waste disposal facilities, and the Nuclear Installations Inspectorate—the U.K.'s equivalent of the NRC.

VOLCANISM

- **Dr. Eugene I. Smith** is an eminent Volcanologist at the University of Nevada in Las Vegas, where he is a Professor of Geology and Chairs the Department of Geosciences. He holds a Ph.D. from the University of New Mexico. He is a Fellow in the Geological Society of America, and previously worked for the U.S. Geological Survey. Dr. Smith has conducted volcanism and volcanic rock studies for the U.S. Navy, the USGS, and NASA. He has authored numerous technical papers on volcanism.

- **Dr. Chih-Hsiang Ho** works with Dr. Smith at the University of Nevada, where he specializes in the statistical aspects of volcanism and is an expert in statistical analysis. He holds a Ph.D. in Statistics from University of Minnesota and is a professor in the University of Nevada's Department of Mathematical Sciences.

SEISMOLOGY

- **Dr. H. C. Clark** is an eminent seismologist and geologist with a Ph.D. in Geophysics from Stanford. He is professor emeritus of Geology at Rice University. His testimony on seismic risks associated with the proposed Sierra Blanca radioactive waste disposal site in South Texas was pivotal in then-Governor George Bush's decision to cancel the project. He has consulted for the U.S. Air Force, numerous petroleum companies, and a plethora of government entities. He has authored dozens of papers on geology, geophysics, and seismology.

WASTE FACILITY DESIGN & ENGINEERING

- **Allen L. Messenger** is a registered civil and environmental engineer who has designed, engineered, and built facilities for the storage and disposal of low-level radioactive, mixed, hazardous, and transuranic waste, and assisted with the permitting of those facilities with the NRC, the Department of Energy, and state regulatory agencies. He holds an M.S. in Civil Engineering from Texas A&M, and for several years was the Head of the Disposal Facilities Unit for the Texas Department of Water Resources.

NRC AND DOE REPOSITORY LICENSING ISSUES

- **Dr. Victor Gilinsky** is a former NRC Commissioner who holds a Ph.D. in Physics from CalTech. Prior to his NRC tenure, he was Head of the Physical Sciences Department and Director of Applied Science and Technology Program at the Rand Corporation. He was also Assistant Director for Policy and Program Review at the U.S. Atomic Energy Commission. He has conducted many consulting studies on nuclear matters as a private consultant.

- **Dr. John W. Bartlett** is the former Head of the Department of Energy's Yucca Mountain Program. He holds a Ph.D. in Chemical Engineering from Rensselaer Polytechnic Institute, and was previously a scientist with Battelle's Pacific Northwest Laboratories. He has extensive background on Yucca Mountain and the high-level waste program generally.

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