LAWRENCE
LIVERMORE
NATIONAL
LABORATORY

LLNL-PROC-400481

Understanding the interplay of increased pressure, residual heat and geologic and geochemical environment on radionuclide migration from underground nuclear tests

R. M. Maxwell, R. L. Detwiler, Q. Hu, A. F. B. Tompson

January 15, 2008

Computational Methods in Water Resources XVII, International Conference
San Francisco, CA, United States
July 6, 2008 through July 10, 2008

Disclaimer

Computational Methods in Water Resources XVII, International Conference
San Francisco, CA, July 6-10, 2008

Special Session:
Fate and Transport of Radionuclides in the Environment: Unique Simulation Challenges

Understanding the interplay of increased pressure, residual heat and geologic and geochemical environment on radionuclide migration from underground nuclear tests

R.M. Maxwell, R.L. Detwiler, Q. Hu and A.F.B. Tompson.
Lawrence Livermore National Laboratory, PO Box 808, Livermore California 94551

Understanding the processes that govern migration of radionuclides from underground nuclear tests is a problem of interest in many places in the world. Whether to gain understanding in the risks to human health, to guide water resources management decisions or as a surrogate for nuclear repository safety, there are a number of complex, coupled processes governing fate and form of radionuclides in the subsurface that need to be understood. These processes include the increased pore water pressure that is present after some underground nuclear tests, the residual heat signature from the nuclear detonation and the natural (i.e. pre-test) and altered (i.e. post-test) hydrogeologic and geochemical setting. We will focus on tests in saturated and unsaturated environments in Yucca Flat at the US Nevada Test Site. These tests all encompass a range of the aforementioned process interactions and provide insight into the broader context of understanding radionuclide migration from underground nuclear tests over a range of scale and environment.

This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

This work was performed in support of the National Nuclear Security Administration, Department of Energy, Nevada Site Office, Underground Test Area Project.