

# **RADIOLOGICAL CONDITIONS AT NUCLEAR TEST IMPACTED SITES IN THE NORTHERN MARSHALL ISLANDS: A STATUS REPORT**

Terry Hamilton, Lawrence Livermore National Laboratory, PO Box 808,  
Livermore, CA 94550, U.S.A.

*hamilton18@llnl.gov*

Steven Kehl, Roger Martinelli, and Michael Tamblin  
Lawrence Livermore National Laboratory

The United States conducted 67 atmospheric nuclear tests in the northern Marshall Islands between 1946 and 1958. Radiation doses calculated for radiological conditions on the main residence islands of Bikini Island at Bikini Atoll; Enewetak, Medren and Japtan Islands at Enewetak Atoll; Rongelap Island at Rongelap Atoll; and Utrök Island at Utrök Atoll show that cesium-137 ( $^{137}\text{Cs}$ ) accounts for up to 98% of the nuclear-test related dose for resettled and resettling populations. About 85 to 90% of the dose is derived from consumption of locally grown terrestrial foods containing  $^{137}\text{Cs}$ , and about 10 to 15% is due to external gamma exposure from residual  $^{137}\text{Cs}$  in the soil. The other long-lived fallout radionuclides of potential concern include strontium-90 ( $^{90}\text{Sr}$ ), Pu isotopes and americium-241 ( $^{241}\text{Am}$ ). Improved understanding of key radionuclides and their relative behaviors and exposure pathways in coral atoll ecosystems, updated assessments based on the effective half-life of  $^{137}\text{Cs}$  in the environment, and introduction of appropriate remedial measures, where deemed applicable, show that the total predicted radiation dose (natural + anthropogenic) at Bikini, Enewetak, Rongelap and Utrök can be managed at each of these sites at levels that are less than the average natural background radiation dose in the U.S. and Europe.

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

\*\*\*\*\*