

TA-15 E-F Site: Downgrade to <HC-3 (Radiological)

J.C. Laul and Ron Selvage
SB-TS, Los Alamos National Laboratory
MS M870, P.O. Box 1663, Los Alamos, NM, 87545
jclaul@lanl.gov, 505-665-9791

LA-UR-11-07064

Abstract:

The objective of this work is to make use of lower airborne release fractions and respirable fractions (ARF*RF)s associated with a semi-arid environment with reasonable moisture content, for an adjusted HC-3 threshold quantity, in order to downgrade a LANL HC-3 firing site to a “Less than HC-3” site.

TA-15 E-F site (31 acre, $1.3E+5$ m²) was utilized as a major firing site from 1945 to 1981. An estimated 43,000 kg of natural uranium (NU) was expended at the site between 1945 and 1957. An estimated 20,000 kg of depleted uranium (DU) was expended between 1957 to 1981, for a total of 63,000 kg, 68% NU and 32% DU. This amount exceeds the HC-3 TQs for NU ($6.2E+3$ kg) and DU ($11.5E+3$ kg) by a sum-of-fractions (SOF) factor of 8.7, per DOE-STD-1027-92. However, the HC-3 TQs are based on the ARF*RF of $1E-3$ per DOE-STD-1027-92.

For final HC, the ARF*RF value for uranium was reevaluated in view of the semi-arid environment. Based on the compacted soil history in the semi-arid environment, moisture content, and vegetation, the revised ARF*RF was estimated to be $1E-6$, which increases the NU and DU TQs by a three orders of magnitude. The SOF becomes $8.7E-3$, relative to the HC-3 TQ ratio of 1.0, and thus makes the final HC of the E-F site a *Less than HC-3* or Radiological site. The FHC is also supported by the bounding aircraft crash that yields a SOF of 0.28 using an ARF*RF of $1E-3$. This approach has been used at Hanford and Oak Ridge.