

Project Summary:

In Situ Gamma Spectrometry Study

Location:

Oak Ridge Associated Universities
(Oak Ridge, TN)

Government Agency:

U.S. Nuclear Regulatory Commission

Project Timetable:

May 2006 to
November 2006

Oak Ridge Associated Universities (ORAU) provided technical assistance to the U.S. Nuclear Regulatory Commission (NRC) to evaluate the use of in situ gamma spectrometry to support decommissioning at various NRC-licensed facilities during final status surveys (FSS).

The primary objective of the research was to evaluate the effectiveness of the In Situ Object Counting System (ISOCS) in achieving stated Data Quality Objectives to support releasing facility excavations and open land areas. ORAU assessed the ISOCS' calibration, data acquisition, effects of topography, effects of background, and most importantly, the modeling assumptions selected to satisfy allowable criteria as defined by the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

Specific research activities consisted of:

- Burying samples and/or sources on ORAU's grounds at various depths based on a prepared field protocol and mapping their location within a specified survey grid using traditional gamma scanning.
- Setting up the ISOCS at the center of designated grids to collect measurements at one- and two-meter distances above the surface.
- Comparing theoretical (ISOCS software-derived) minimum detectable concentration limits (i.e., MDA/MDC determinations) with empirically determined limits.
- Evaluating the relationship of discrete particles containing elevated radioactivity to in situ measurements including the ability to detect these particles in the detector viewing area (field of view).

ORAU provided a report titled "Spatially-Dependent Measurements of Surface and Near-Surface Radioactive Material Using In Situ Gamma Ray Spectrometry (ISGRS) for Final Status Surveys" to the NRC. The report provided conclusions, advantages, disadvantages and recommendations on the evaluation of gamma scanning versus the ISOCS techniques as stand alone and combined methods for performing FSS.



Partnerships for Innovation



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