

Large Area Mapping Using ISOCS and Geostatistics

Scenario generated from the ORNL scrap measurement campaign and Envisol's geostatistical analysis of data

Scope:

- NDA Characterization of Five Metal Scrap Piles at K-770 building (40,000 tons total)
- Metal accumulated from Oak Ridge Gaseous Diffusion Plant from 1965–1985
- Quantification of low-enriched uranium and trace concentrations of Cs-137 and Co-60

Key Drivers:

- Significantly reducing costs by using innovative techniques
- Increasing characterization flexibility without degrading data quality
- Minimizing the safety risks of direct personnel contact with the scrap metal
- Localizing areas of potential concern on a 2D map



**3 steel piles, 2 aluminum piles
27,000 tons total**

16A Pile:

- 21 Measurements
- 3 hours each
- Measurement footprint: 30'-diameter x 10"-20" deep



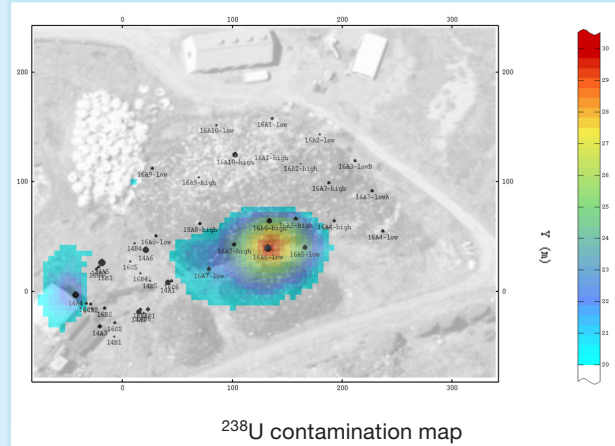
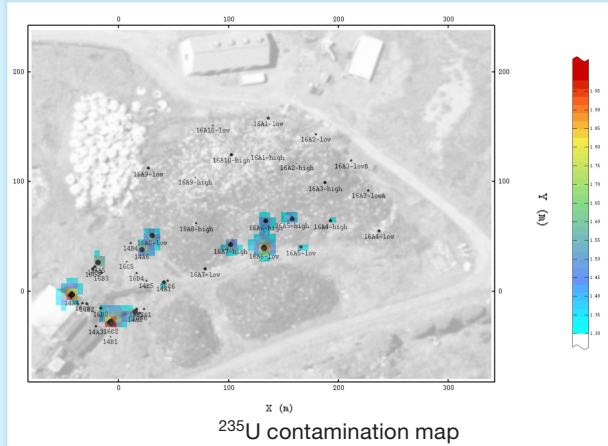
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MIRION
TECHNOLOGIES

Instruments & Techniques Used:

- Germanium detector with WIDE (150 degree) field-of-view collimator and ISOCS
- ENVISOL data analysis and interpretation using Geostatistics methodology
- 2D mapping of contaminated areas



CANBERRA/ENVISOL Solution:

- CANBERRA/ENVISOL teaming approach to provide an innovative and integrated solution using ISOCS measurements combined with geostatistics
- Avoid sampling method and off-site analysis with ISOCS direct measurement method (10-20 inches measurement depth)
- Provide visual result of contamination localization
 - Evaluation of the financial risk of the project with a precise estimate of the incurred decontamination costs

ACHIEVEMENTS

- Characterization and contamination mapping of 3 steel piles, 2 aluminum piles for a total of 40,000 tons
- The project was completed in seven weeks, achieving a 38% reduction in total project duration compared to standard method
- Analysis turnaround times less than one day, compared with 14 days expected for sampling, shipping, and laboratory analyses
- ENVISOL and CANBERRA provided the most accurate characterization while optimizing all costs incurred, achieving 70% reduction in characterization costs compared to standard method