

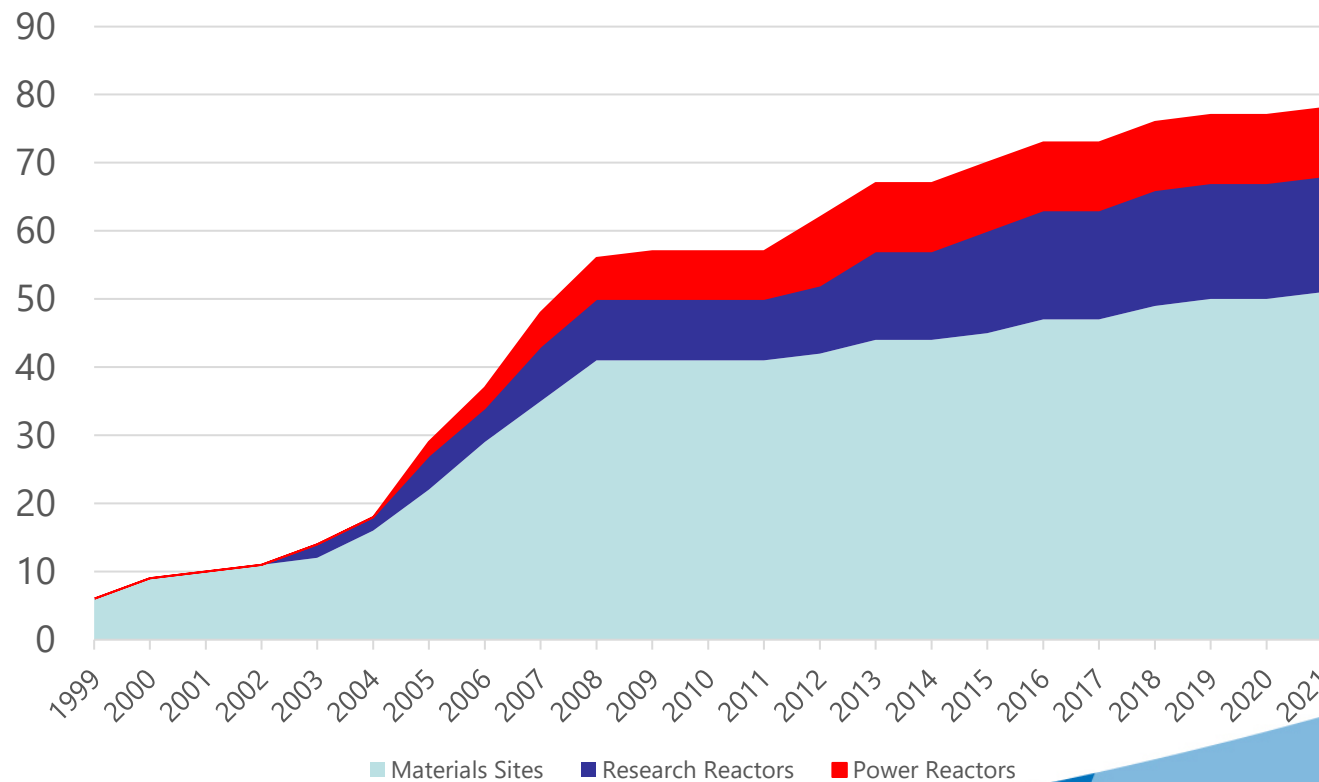
"Survey Issues with Excavations From Recent Decommissionings"

Subsurface Workshop
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NRC Decommissioning Experience

Cumulative Completion of Decommissioning Sites
1998-2021



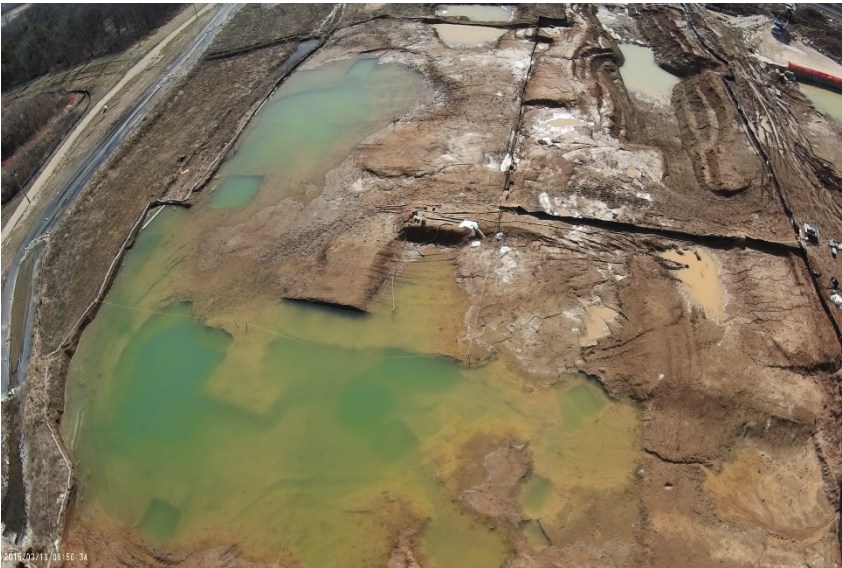
To Excavate or Not?



Excavation Required



Seasonal Flooding Issues?



Weather Impacts?



Shallow Ground Water?



Background Issues?



Excavation Depth?



Contaminant Layering and Stratification

Example of Burial Pit Soil Discoloration



Excavation Safety



Surveys of Backfill Materials

- Generally, State Regulators have concerns over backfill material constituents and dose
- Backfill plans must be addressed in the Decommissioning Plan (LTP)
 - Include a Survey Plan for determining the residual radioactivity to support dose modeling
 - Need to address residual radioactivity and dose contribution (ALARA)
 - Need to address origin and constituents of the backfill (soil, concrete debris)
- Survey Plans:
 - Radionuclides from Characterization and excavation surveys
 - Based on MARSSIM
 - Scan Surveys of soil, typically 6-inch (15 cm)
 - Sampling for lab analysis
 - Direct Measurement Sampling
 - As left surveys and sampling after backfilling with 6-inch lifts.
- Backfill compression to prevent depression

Survey and Sampling Concerns

- Excavation sidewall issues
 - Survey unit area (bottom and sides)
 - Sampling of sidewalls
 - Scanning of sidewalls
- Composite Sampling and averaging
- Inaccessible areas (?)
 - Standing or running water
 - Excavation sidewalls
 - Gas pipeline and other safety concerns
 - Mud, ice and snow
 - Rocky substrate

Survey Concerns

- Under building subsurface activity is always a concern and the licensee needs to address in the site characterization report.
- High background count rates generally indicates that of the residual radioactivity has not been remediated.
- Based on the radionuclides present, soil lifts need to be limited to 6" (15 cm) for surveys to be effective. Reminder: MARSSIM is based on 6" inch (15 cm) depth.
- Need to verify that the survey unit has been remediated to the proper depth to remove the residual radioactivity
- Class 1 surveys require 100 % SCAN surveys, if not already in the approved Decommissioning Plan, seek **Regulator** input for unusual situations.
- Class 2 and 3 areas require minimal Scan Coverage, chose the most where residual activity is likely to be present.

Subsurface Issues?

In developing guidance for subsurface surveys/sampling, many of the issues with excavation surveys, sampling and safety may be applicable.

Thank you for the opportunity to speak today!