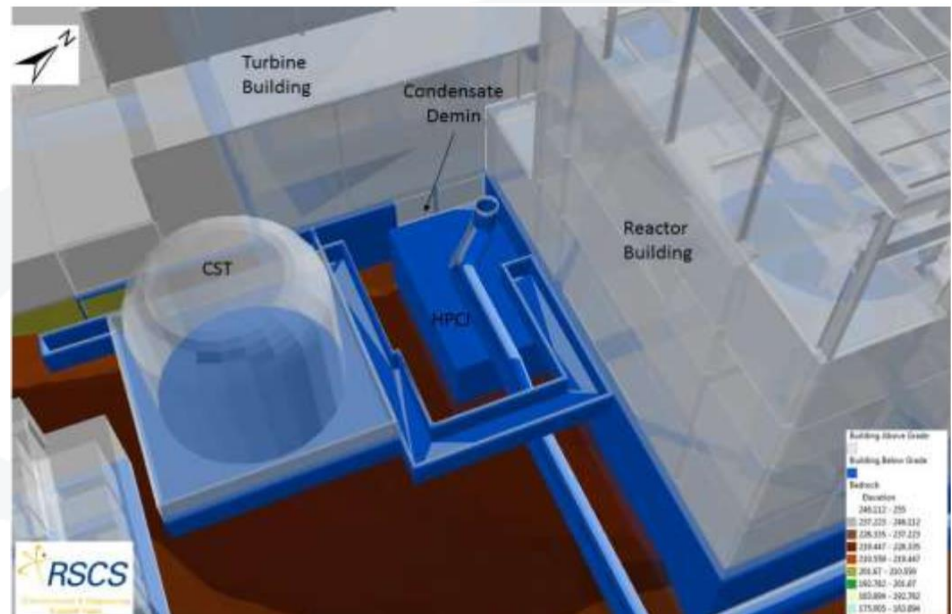


Using 3D Site Modelling throughout the Decommissioning Lifecycle

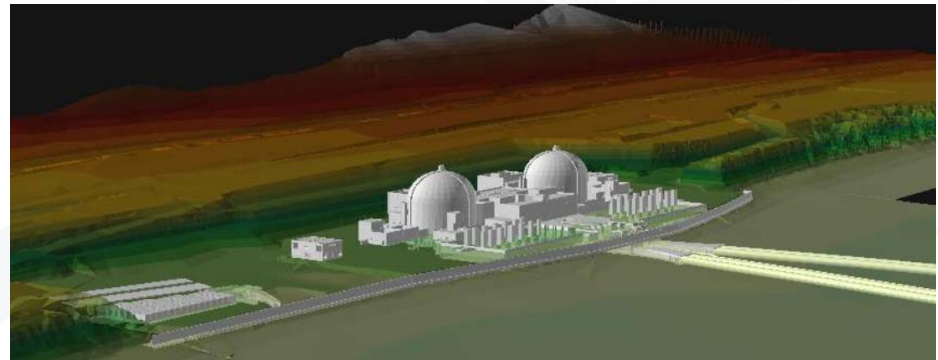
Eric Darois, CHP
James Tarzia, CHP
Executive Directors

Nuclear Decommissioning &
Used Fuel Strategy Summit
Sept 30 – Oct 1, 2019
Charlotte, NC

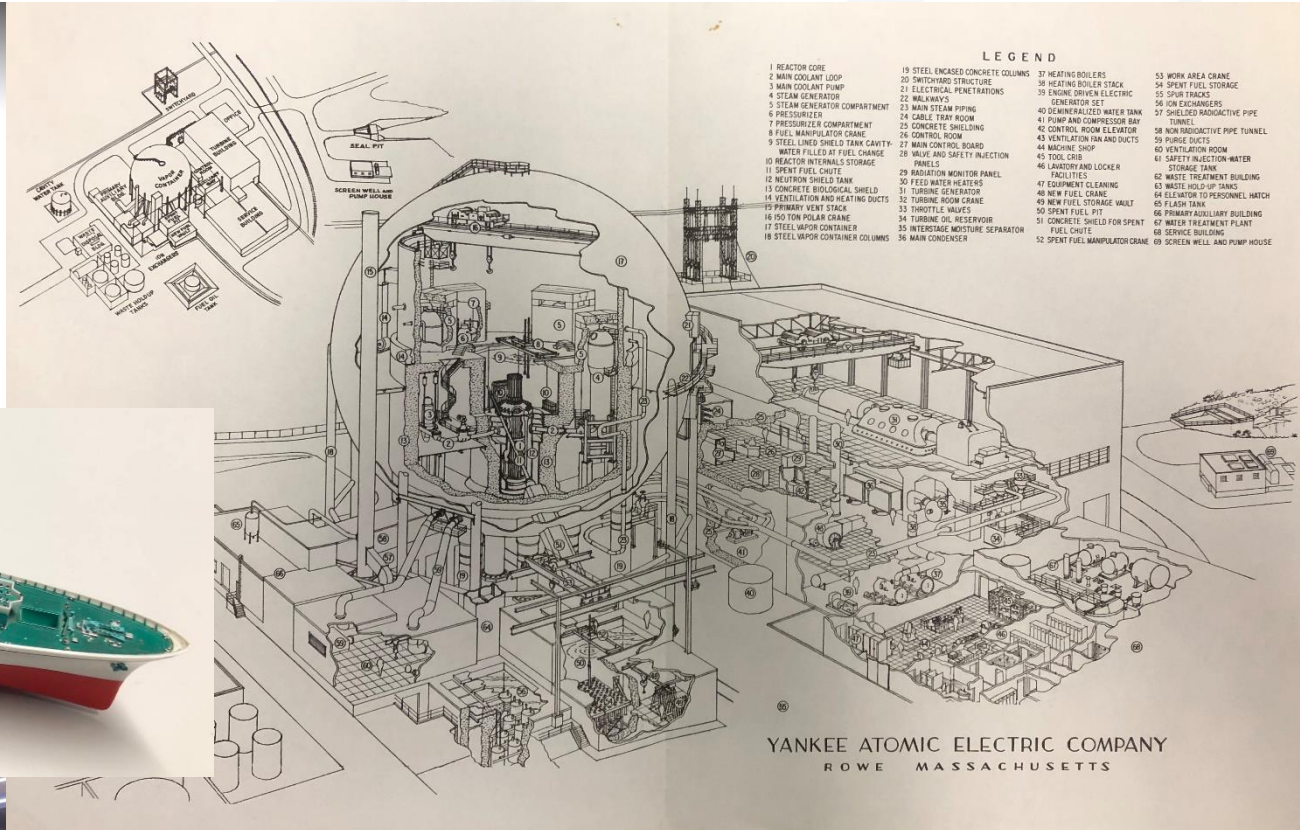
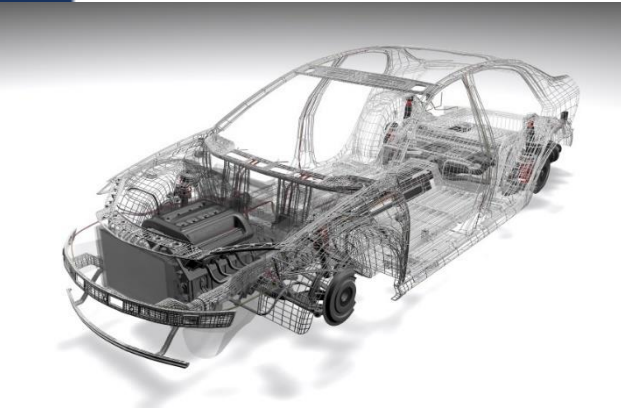


Discussion Topics

- Developing the Model
- Applying the Model
 - System Removals
 - Site Logistics
 - End-State Planning
- Stakeholder Engagement
 - Public Meetings
 - Regulator Communications
- License Termination Plan (LTP)
 - Site Figures and Maps
 - Final Status Surveys



Why Models: Spatial Planning for Implementation and Communication



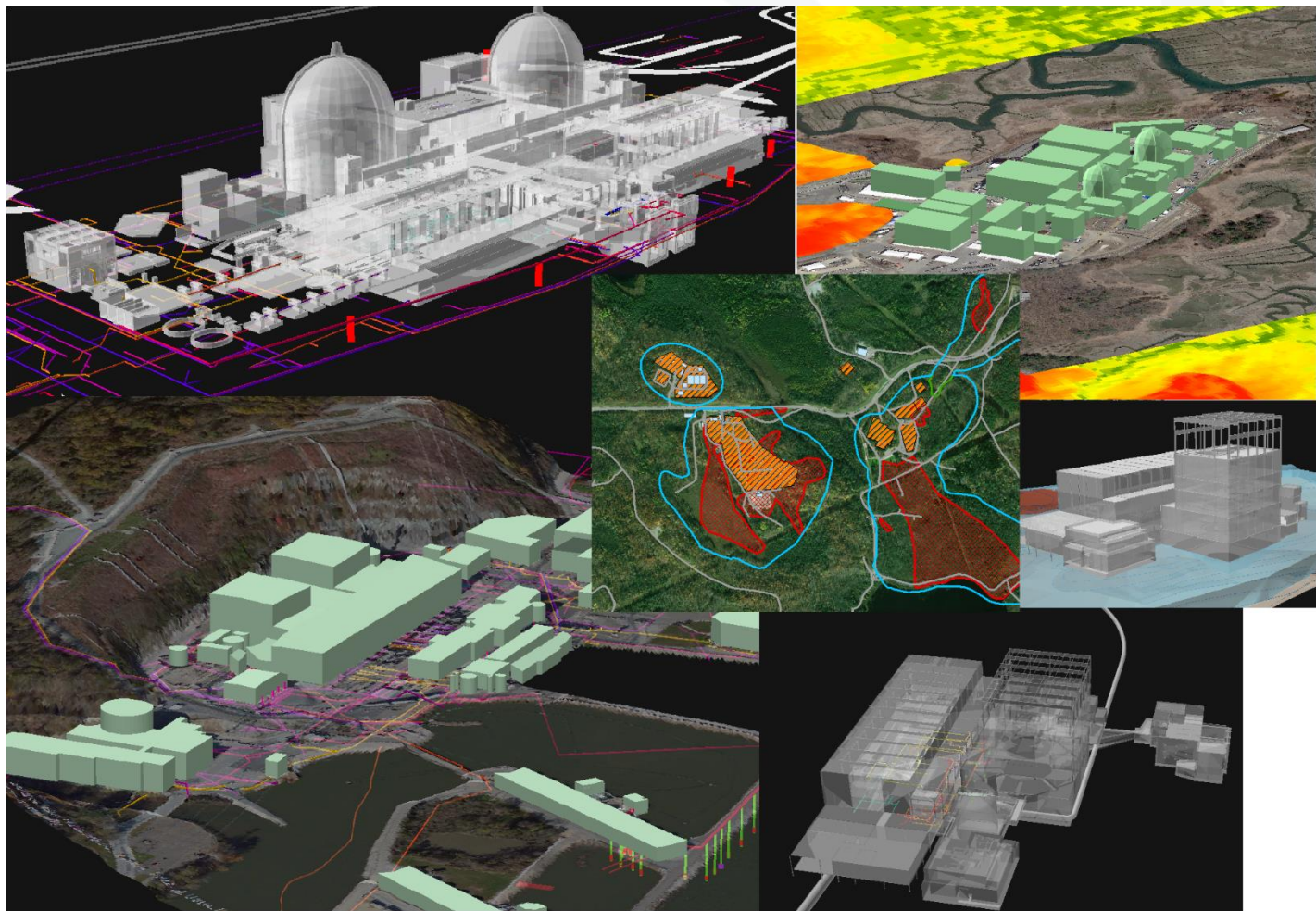
Model Tools

- CAD & GIS Software
- Qualified Staff
 - Reading 2D “Blue Prints”
 - Education
- Model Inputs
 - Prints
 - LiDAR Surveys
 - Geologic/Hydrogeologic Data
 - System Engineers

Digital Plant Models

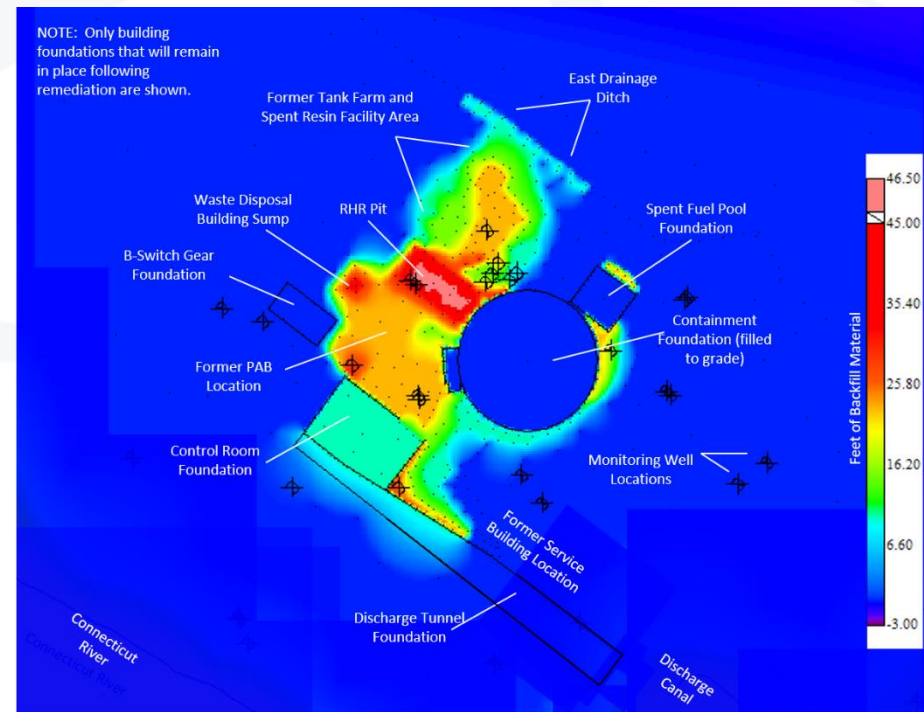
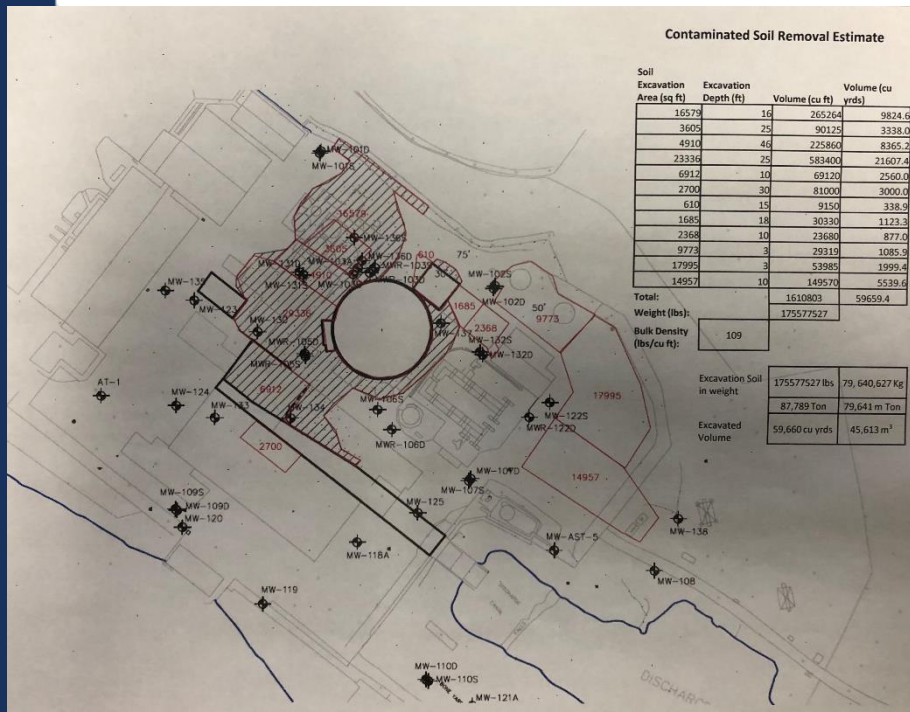
- Create 3D, scale, digital models of the plant structures & components, property and surrounding region.
 - Site mechanical, structural and ISO drawings
 - Regional data (state and local maps, data etc.)
 - Digitization of FSAR maps (boring logs etc.)
 - Any other scope-relevant data
- Link Spatial 3D model to site data and/or databases via Geographic Information Systems (GIS)

Example Models

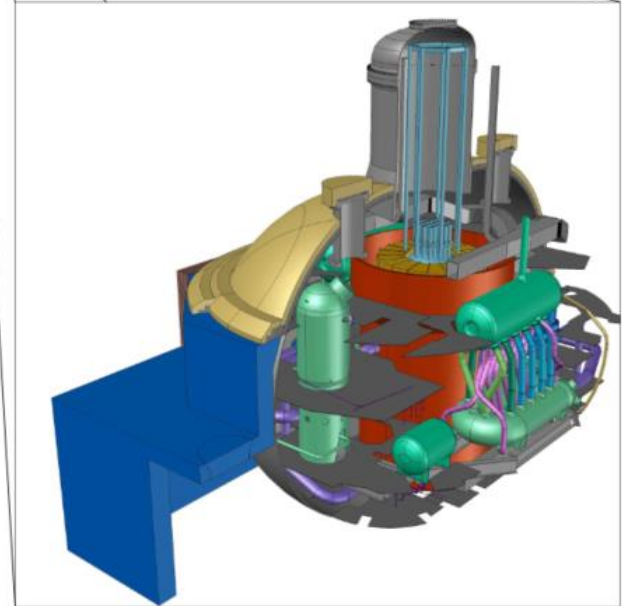
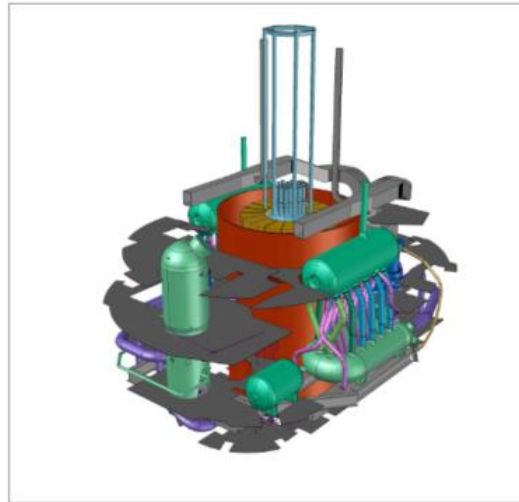
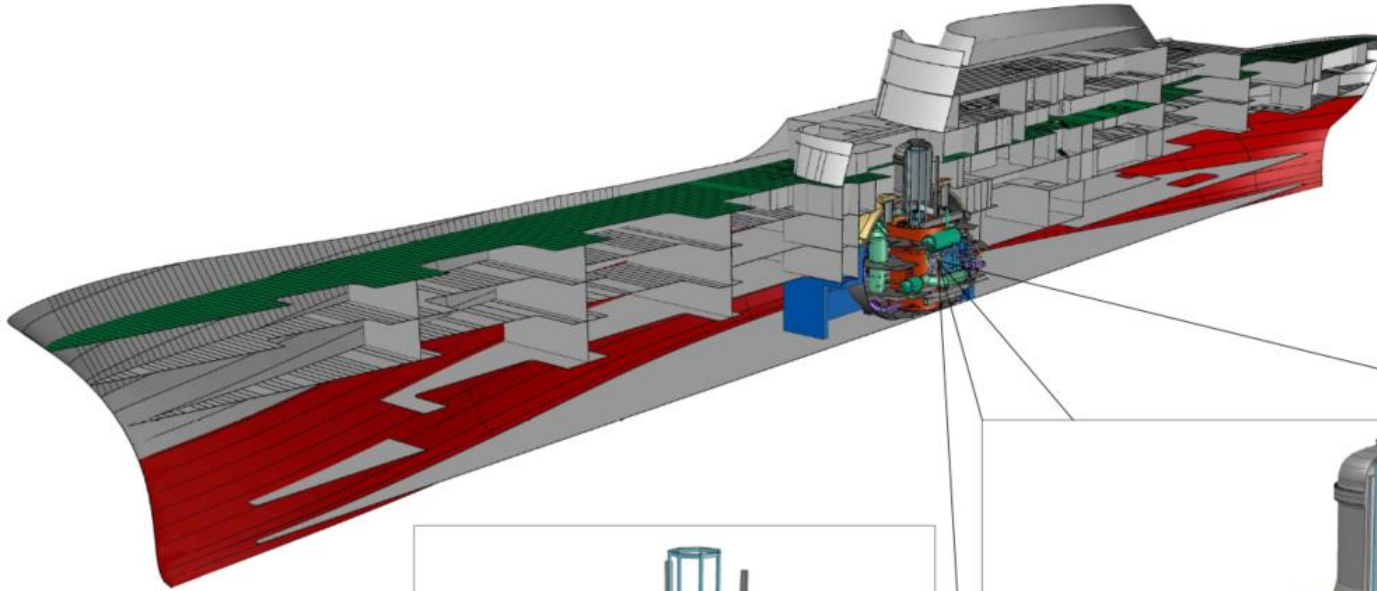


Digitization and Model Use Circa 2004

- Connecticut Yankee (D&D):
 - GW Plume Delineation
 - Contaminated Soil Delineation (>DCGL's)
 - FSS Design
 - GW Fate and Transport Modeling
 - Parameter selection and validation for RESRAD



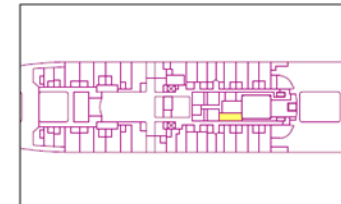
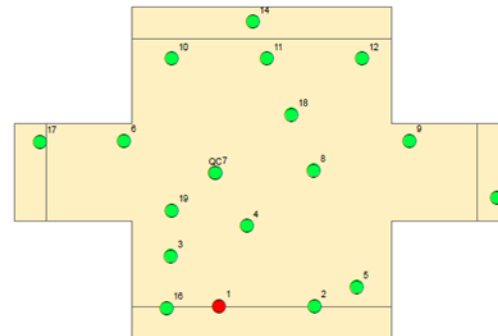
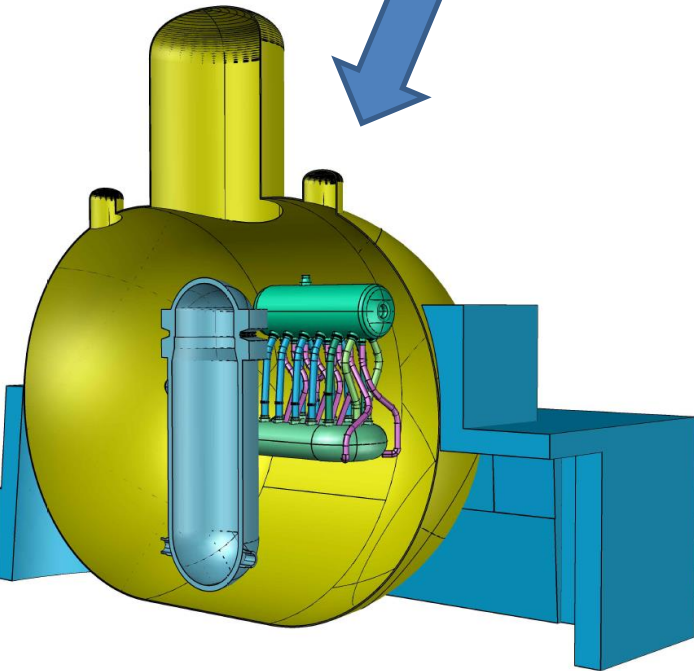
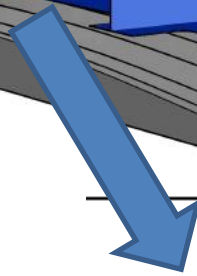
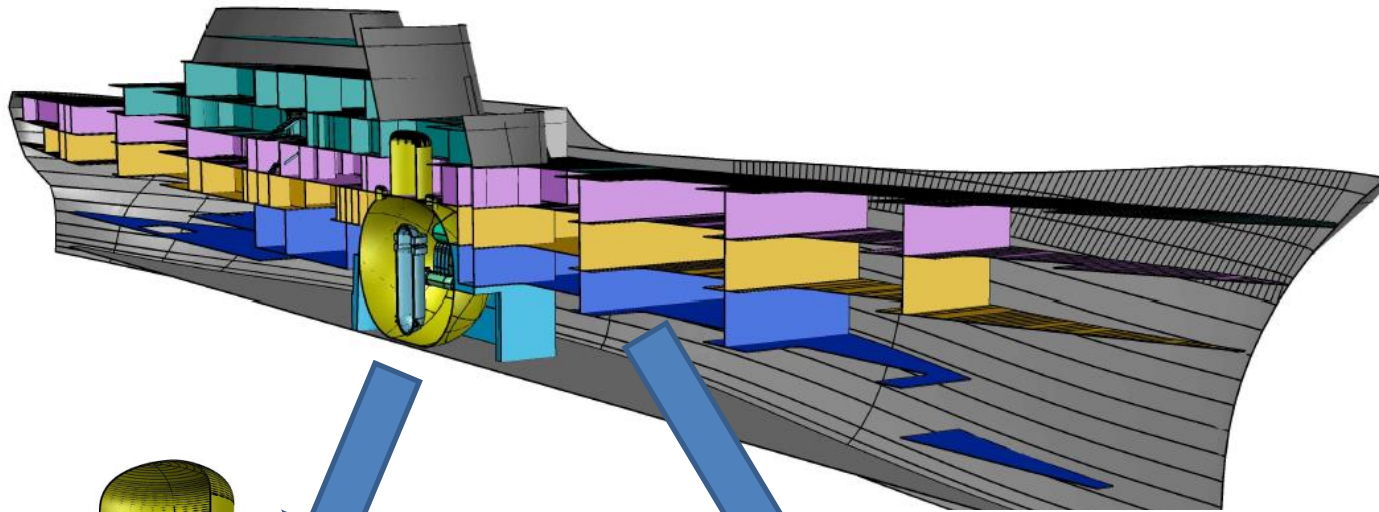
NS Savannah D&D



NS Savannah: Stakeholder Communication

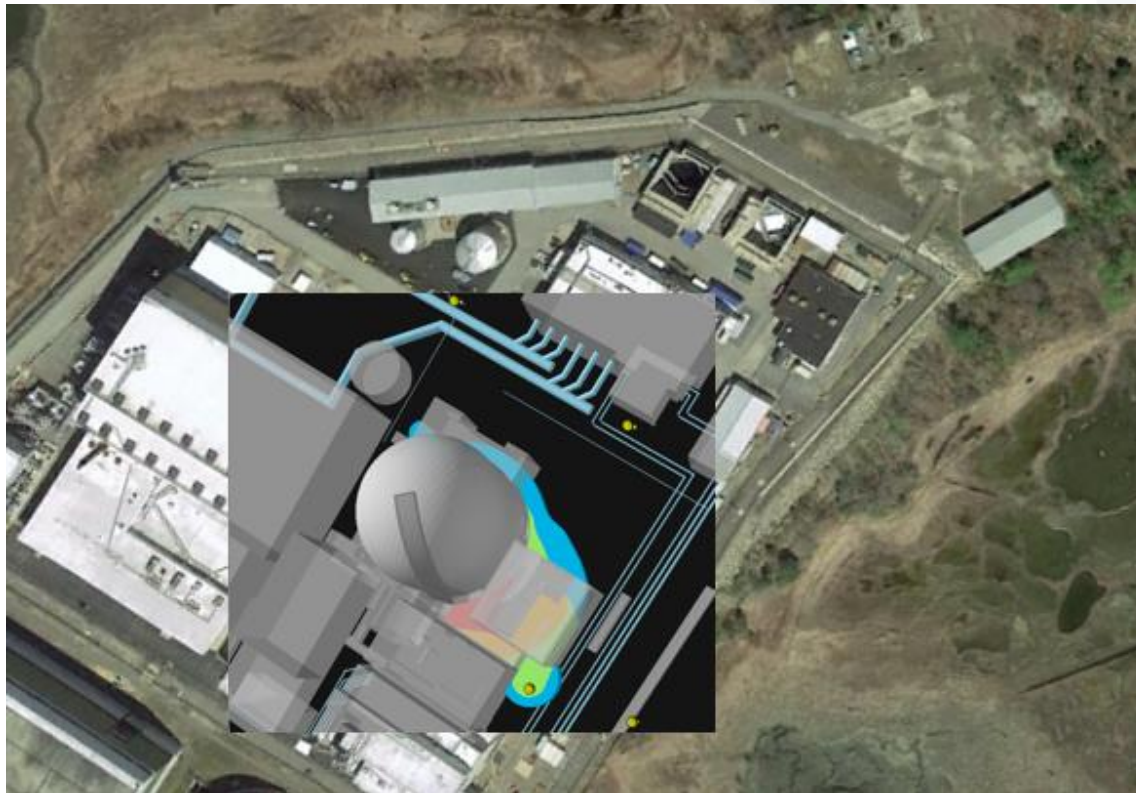


NS Savannah Survey Design and Mod Support

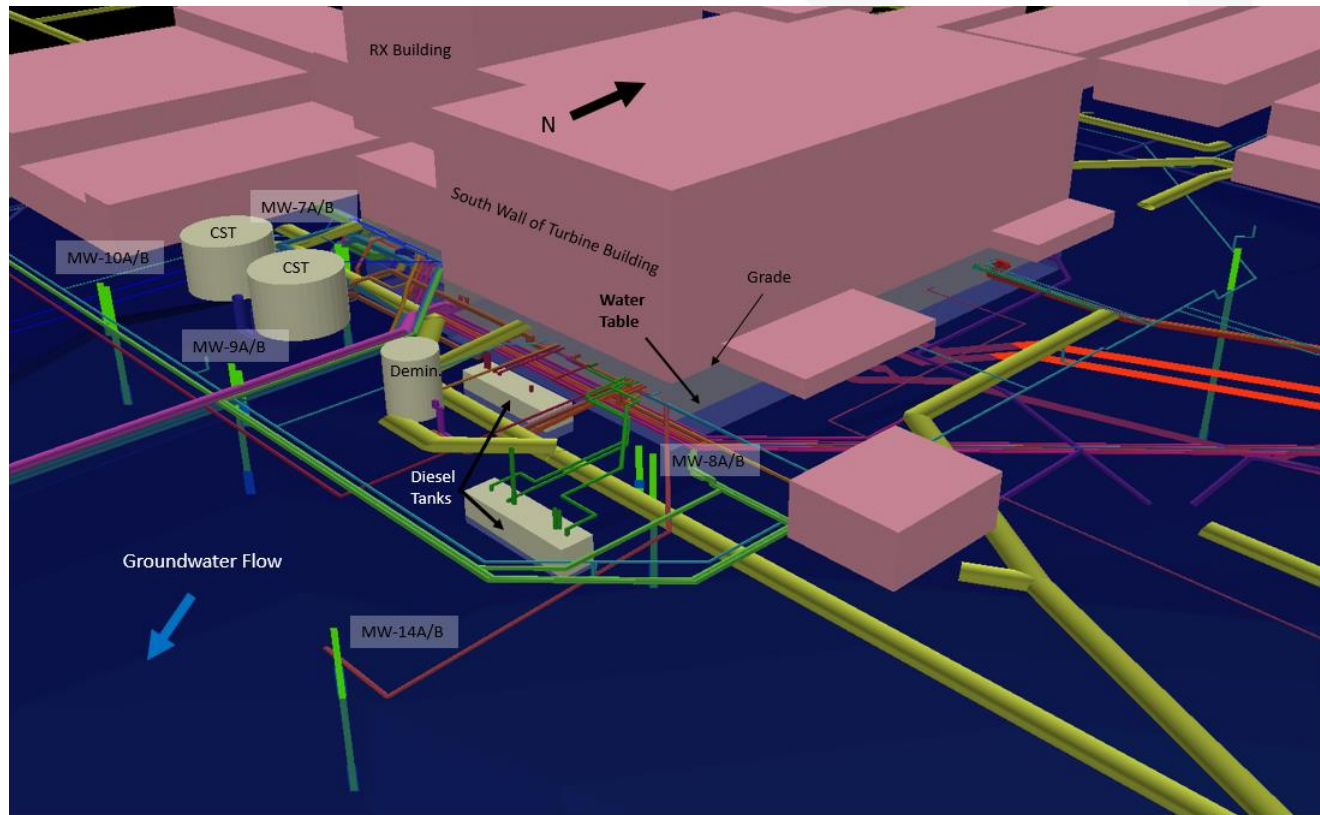


Location	NS Savannah
Survey Area	
Legend	
Static Alpha dpm/100 cm ²	
● Over 27	
● Below 27	
■ Areas 108A1	
108A1	

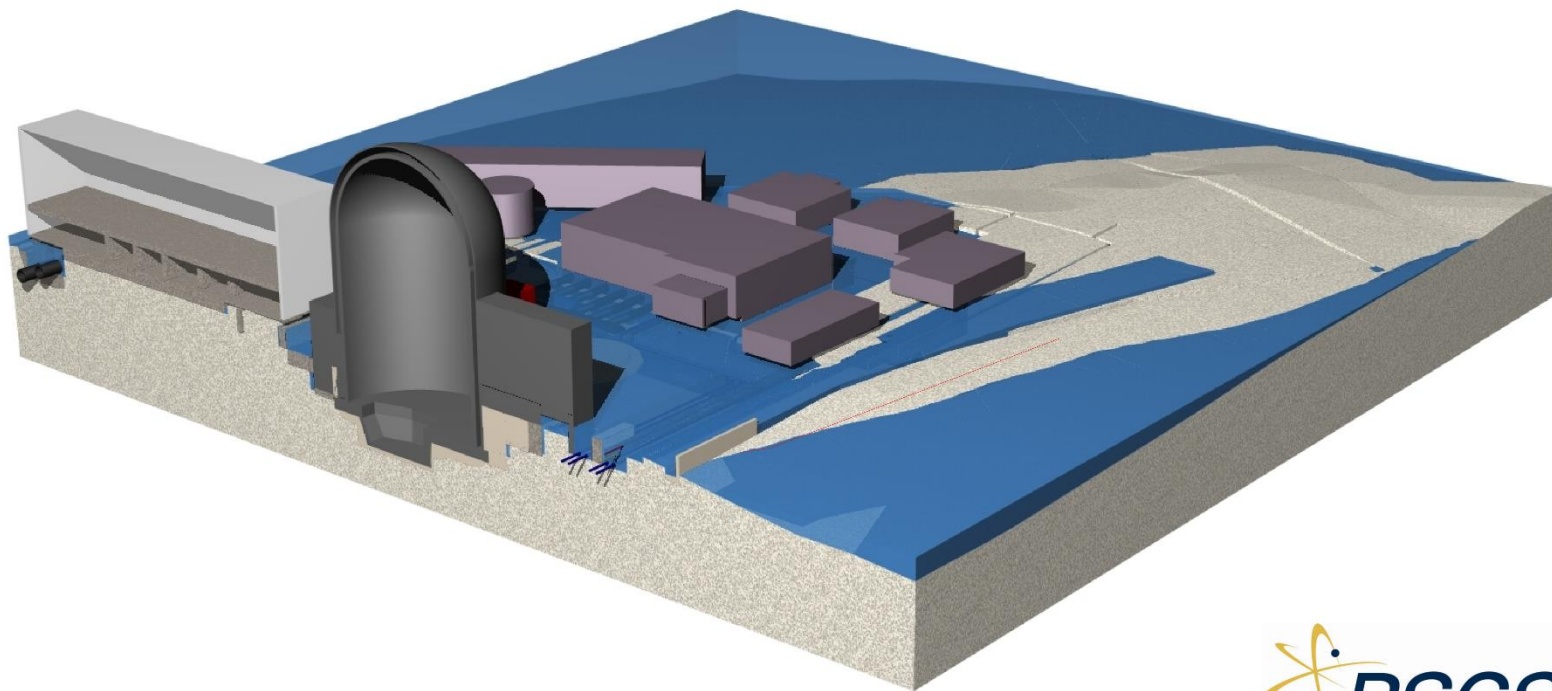
PWR – Buried Pipe Evaluation



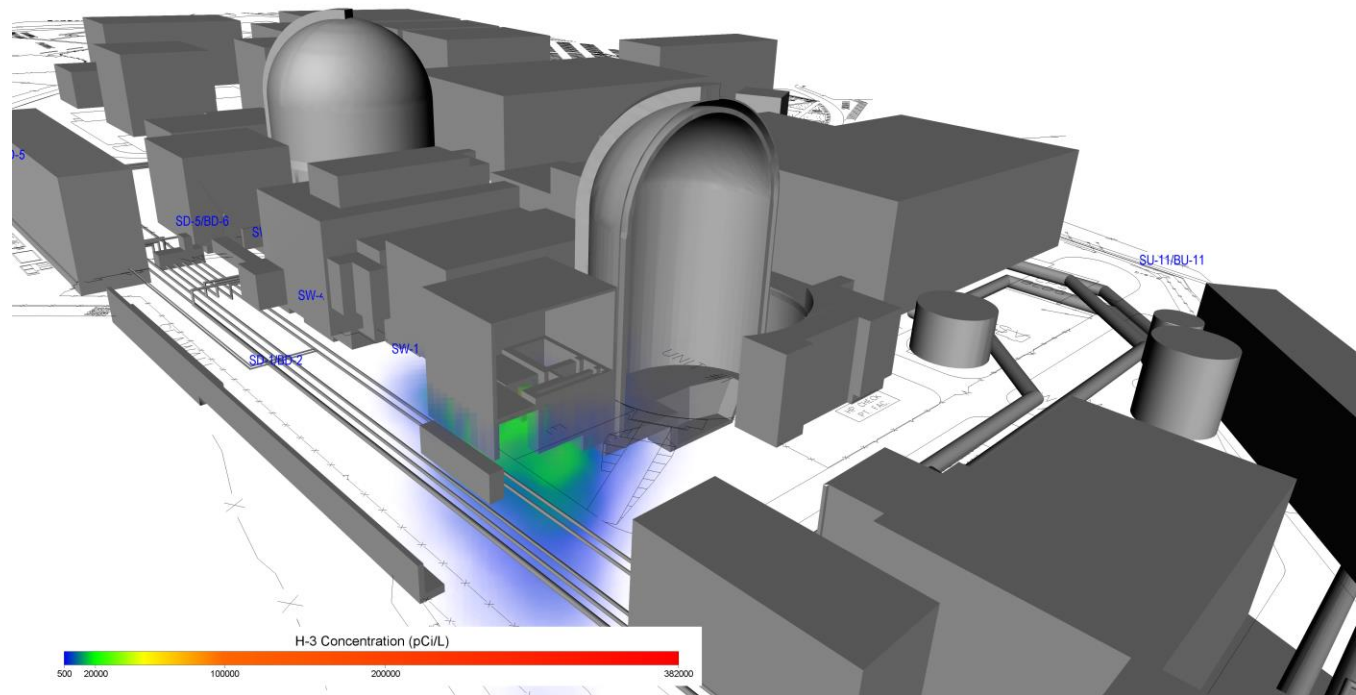
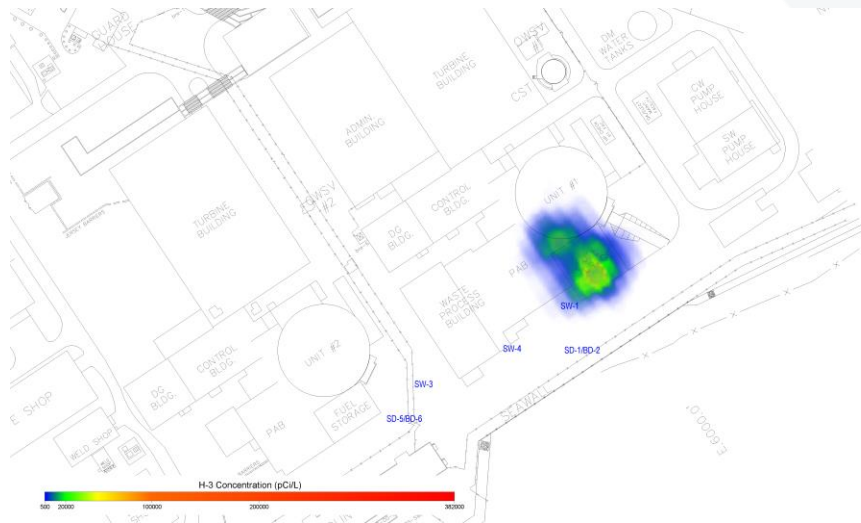
Groundwater Plume Investigation



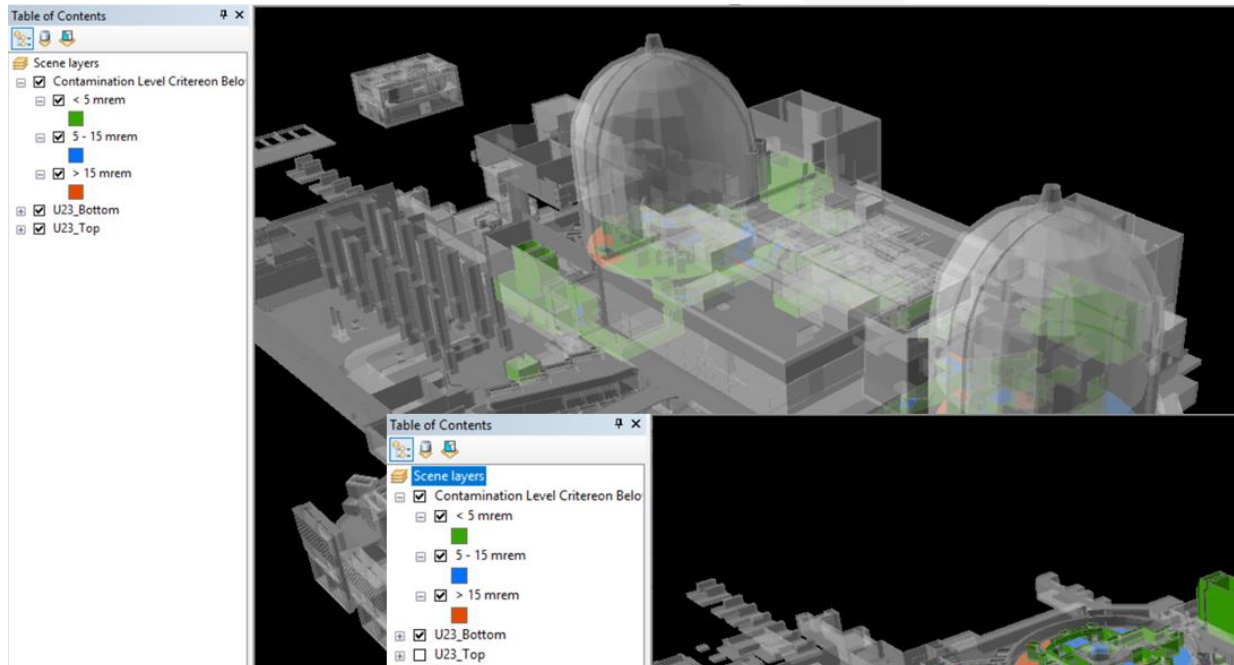
Groundwater In-Leakage



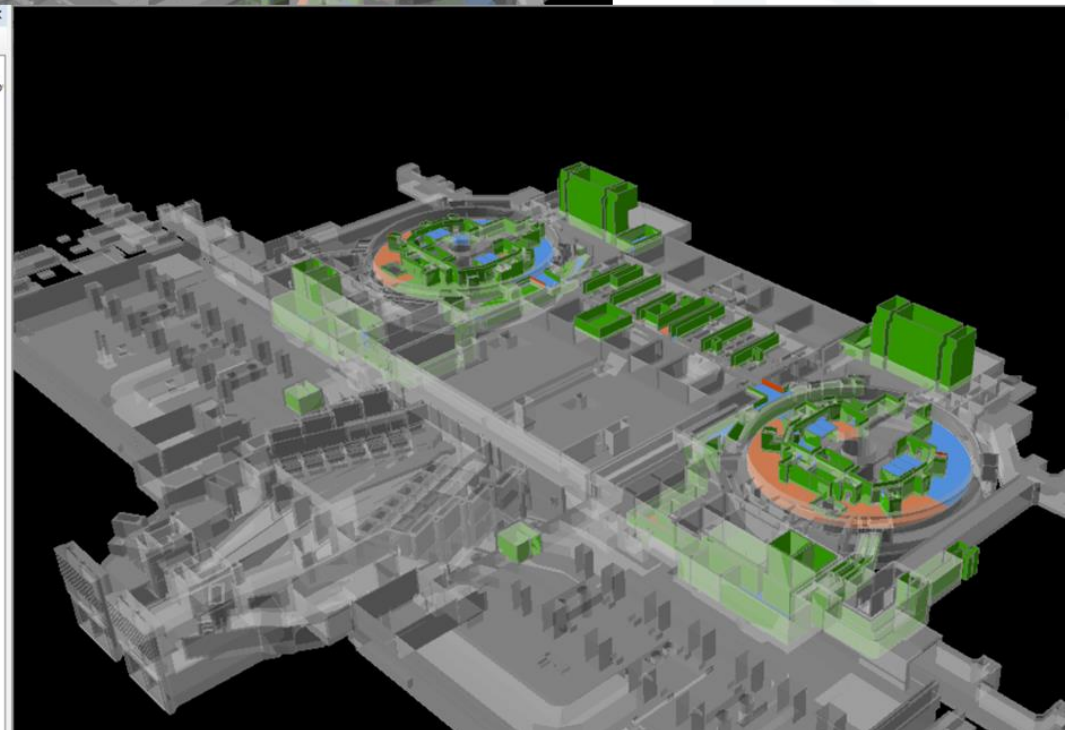
RSCS Digitization and Model Use Today:



RSCS Digitization and Model Use Today:

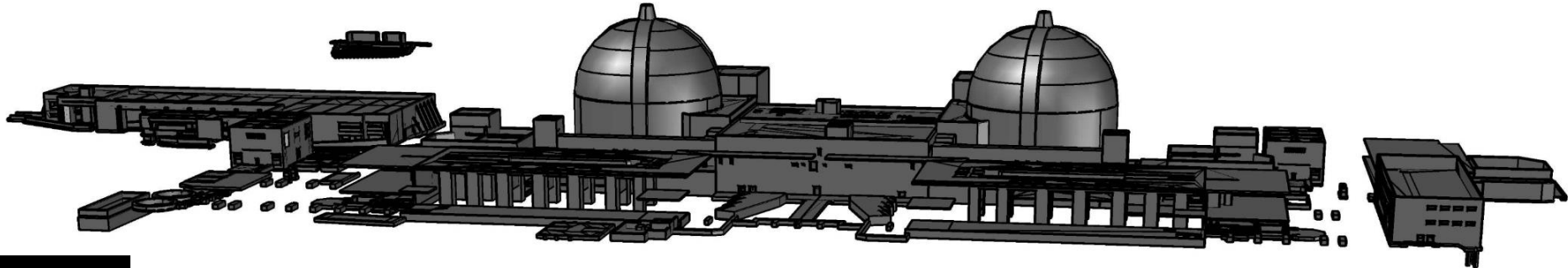


Contaminated
Surfaces By DCGL:

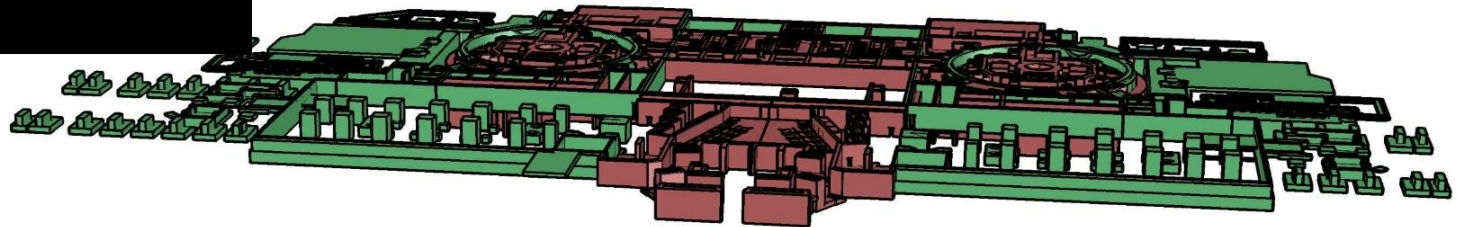


Demolition Take-Off Estimates

PHASE II
Approx. In-Situ Mass (lbs):

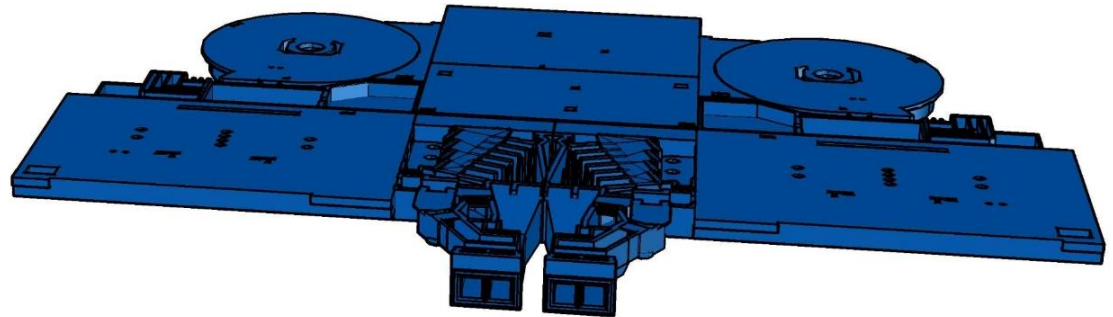


Approx. In-Situ Mass (lbs):



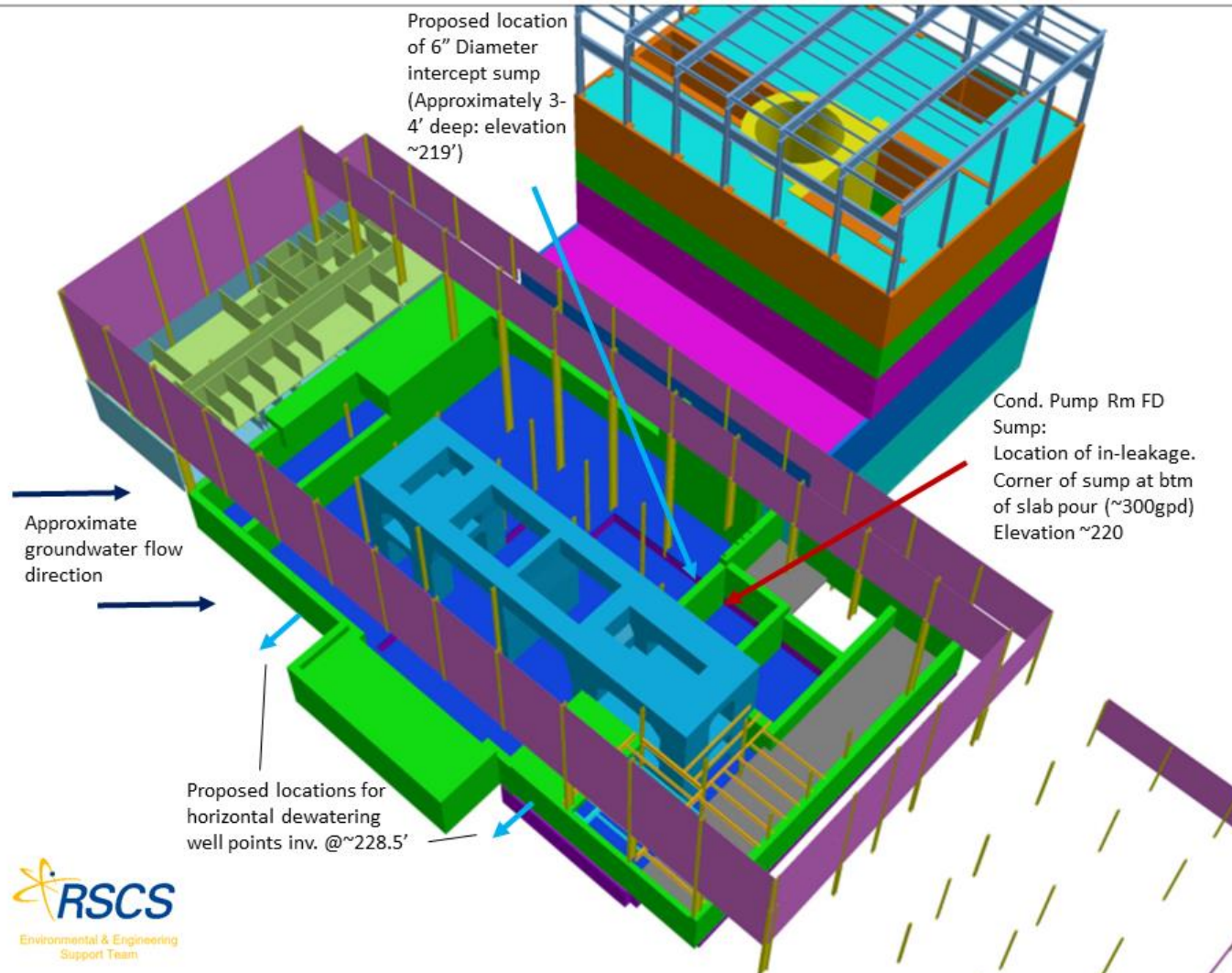
CONCRETE

Approx In-Situ Mass (lbs):

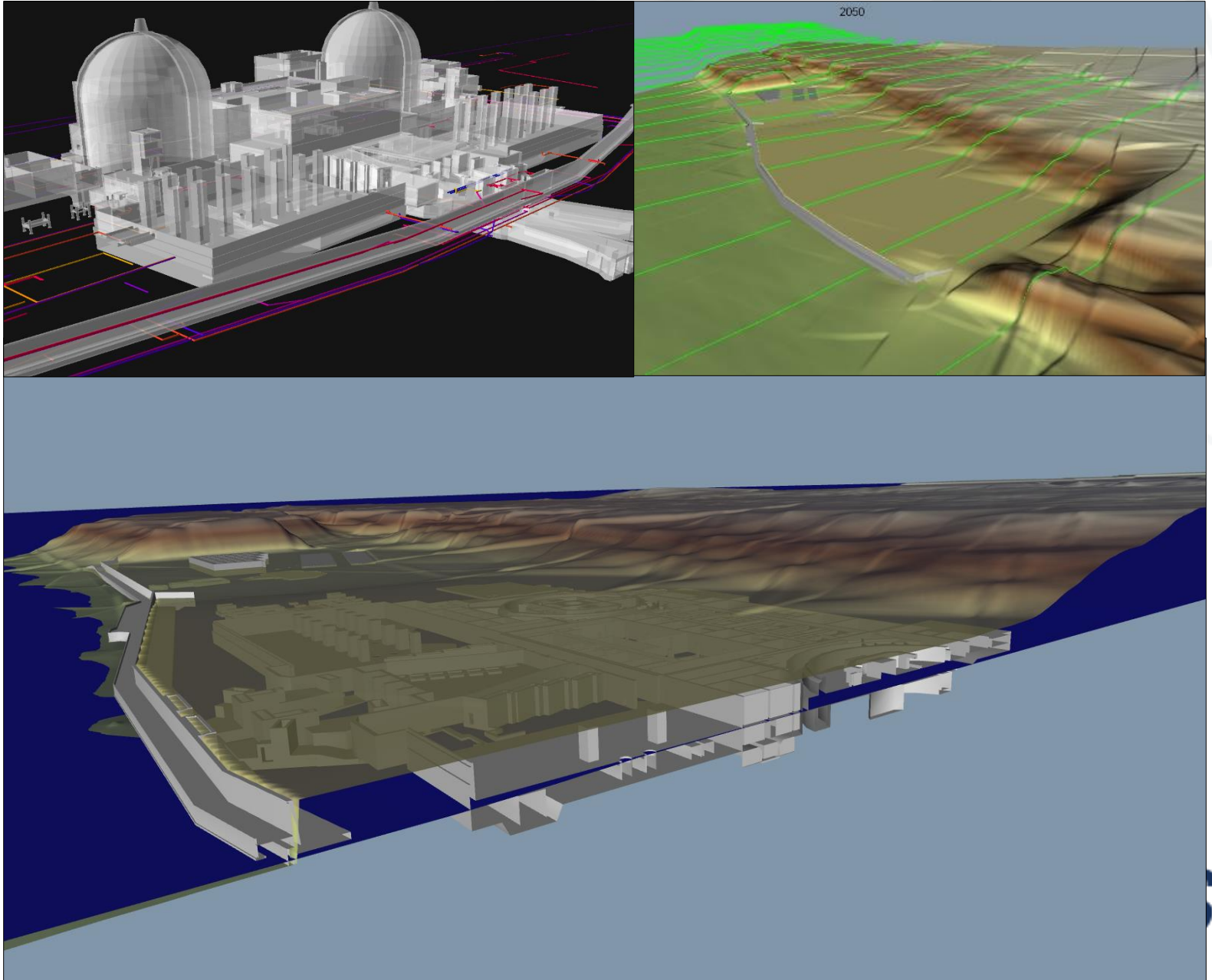


SAFESTORE and D&D Support

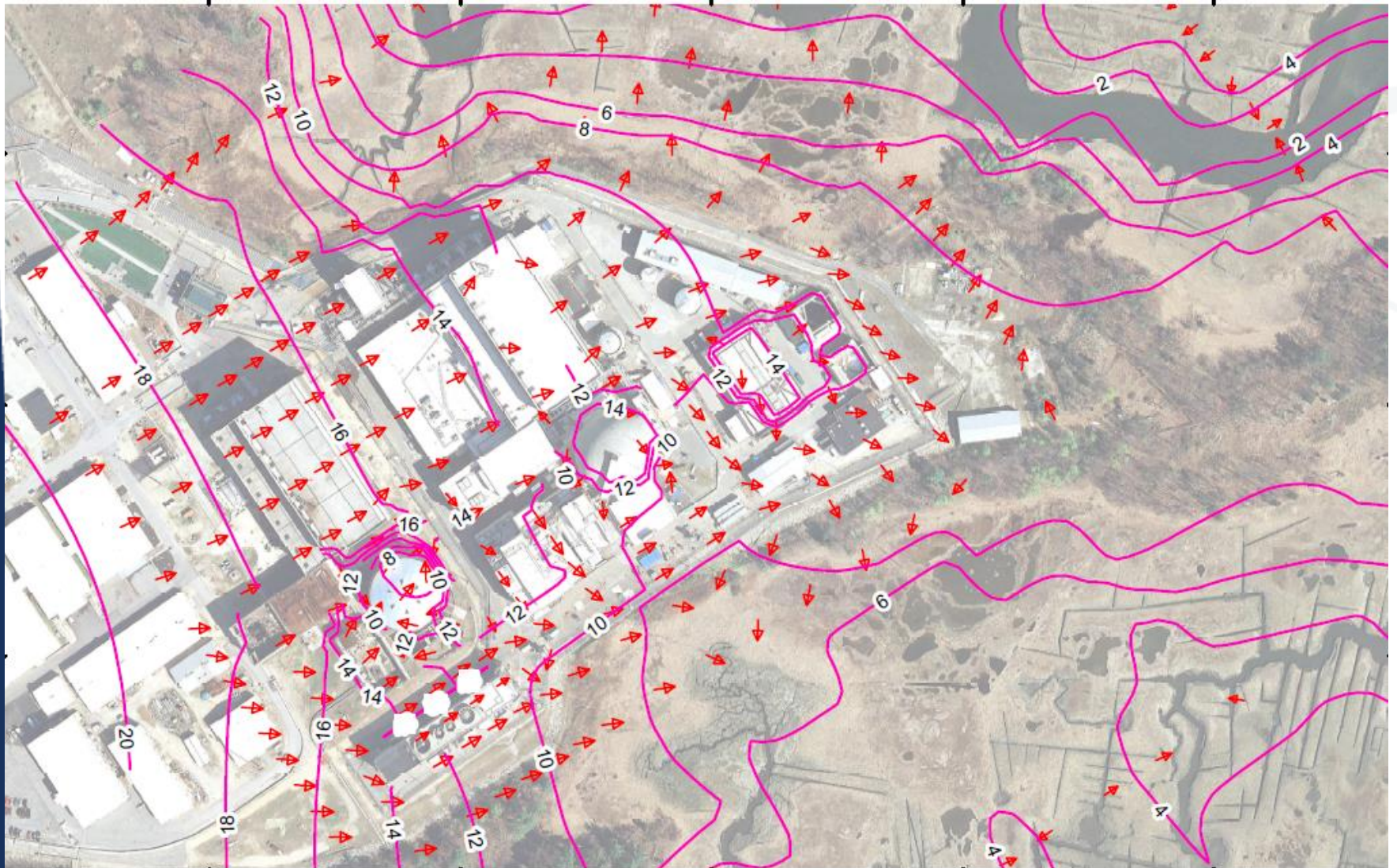
Proposed Dewatering Arrangement (BWR)



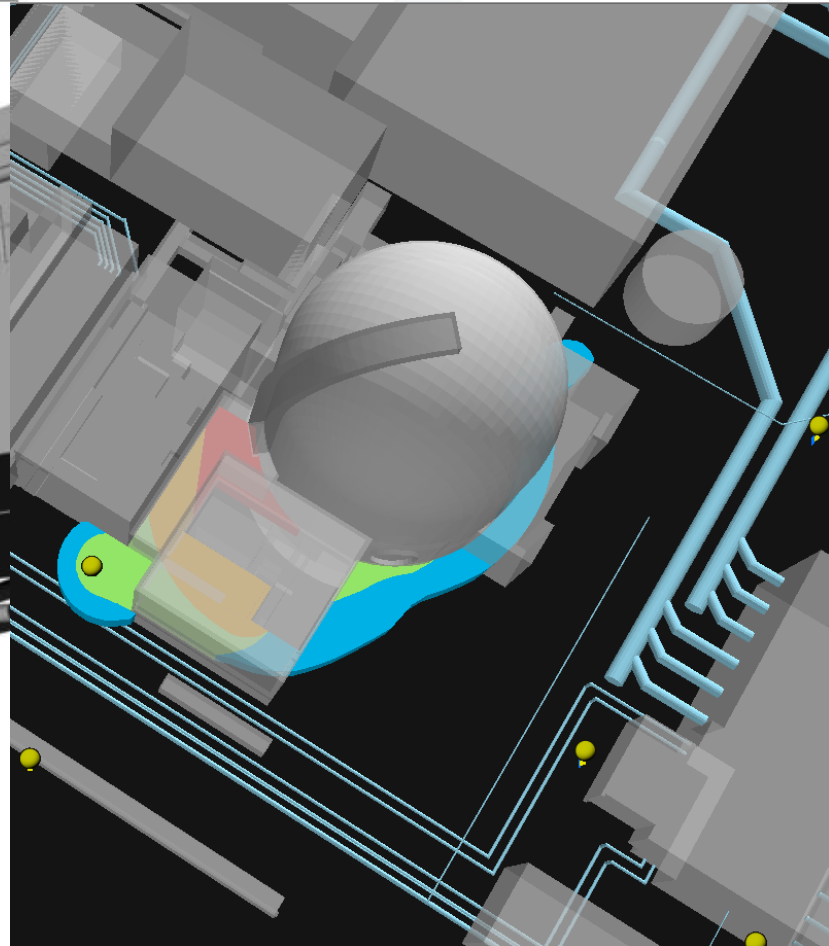
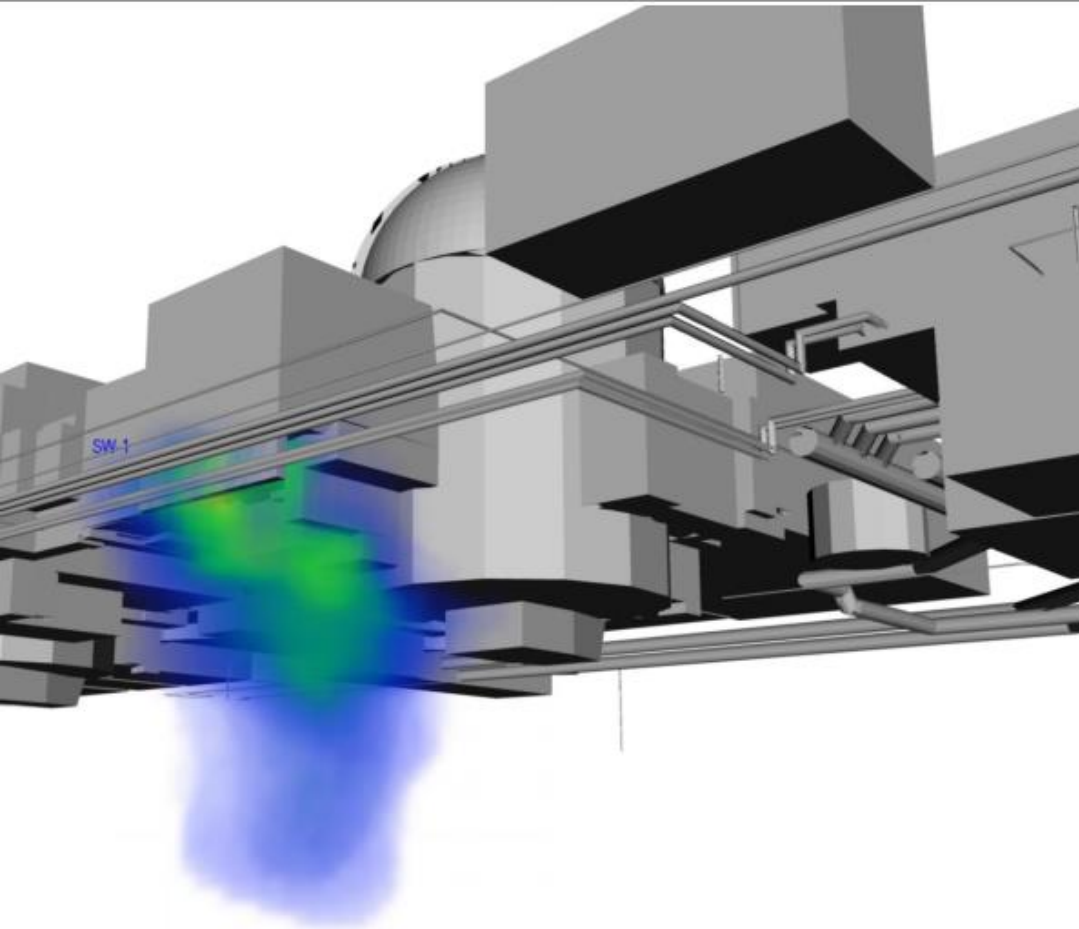
End-State Planning



Simulated/Modeled Water Table Elevations w/Flow Vectors

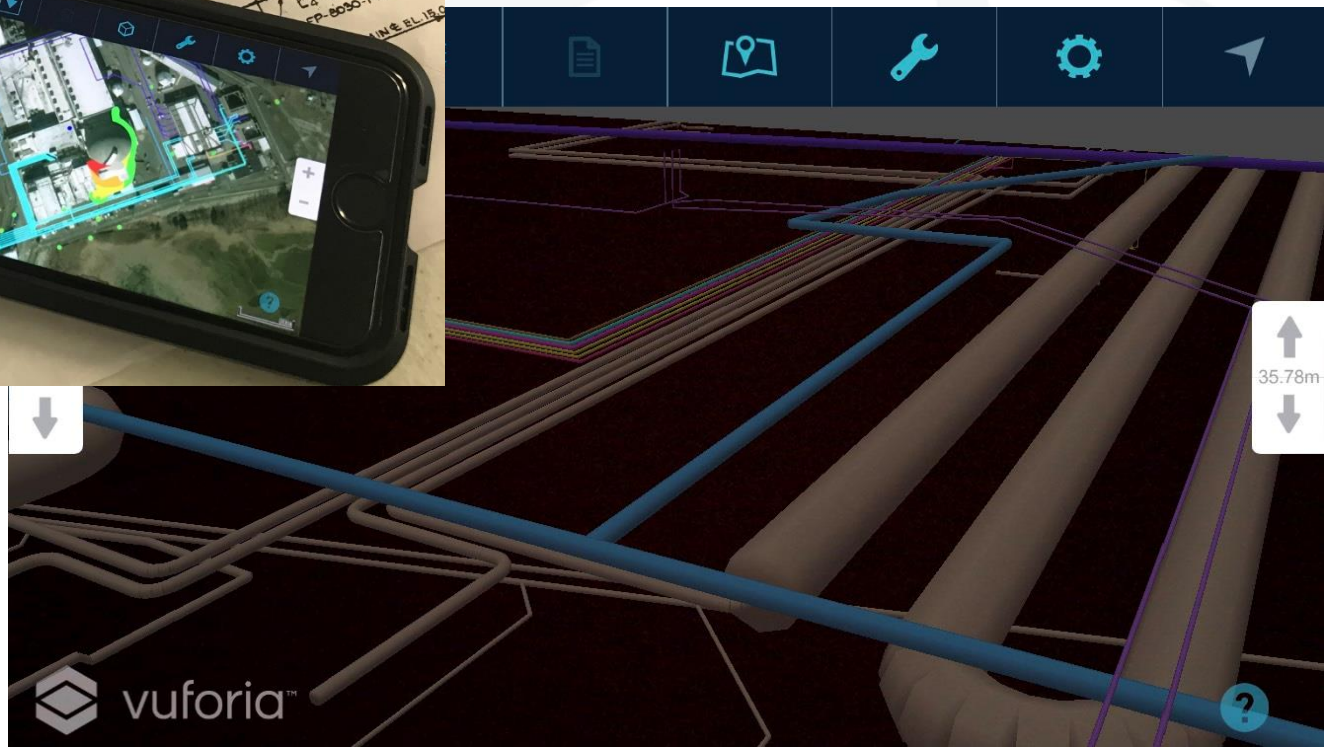


GM Model Output: Tritium Fate and Transport



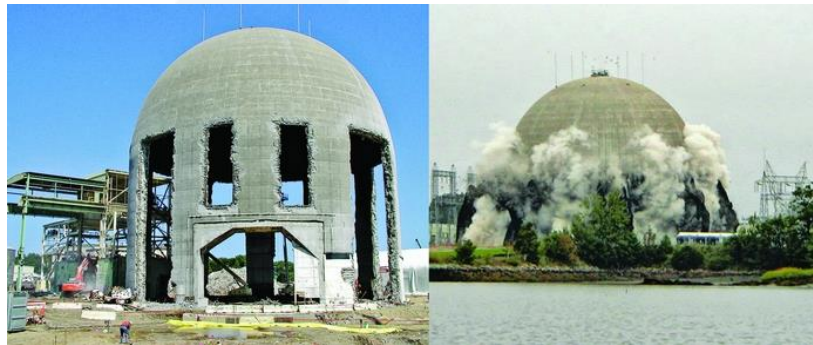
Model Use in the Field

- Sub-Inch Accurate GPS Enabled Augmented Reality Linked to Site GIS Data:
- AugView:



Applying the Model

- System Removals
 - Work Sequencing
 - Site Logistics – Heavy Equipment and Waste Management
- End-State Planning
 - Structures and Foundations to Remain
 - Cost for Excavations



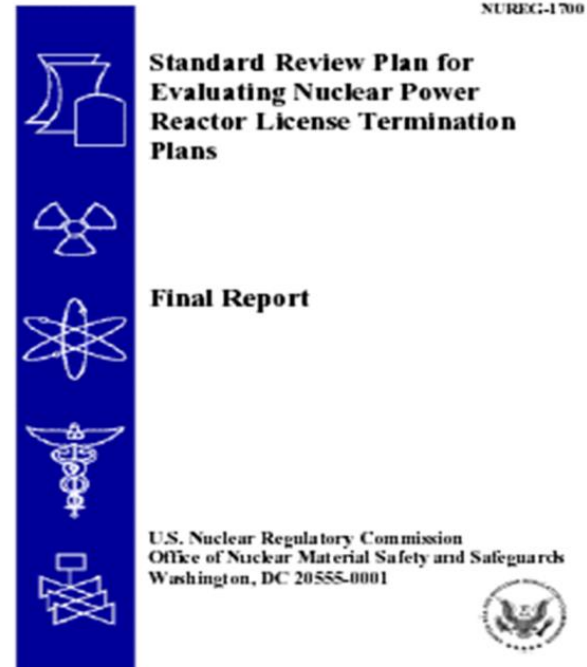
Stakeholder Engagement

- Public Meetings
 - Public Outreach
- Regulator Communications
 - Site Constraints



License Termination

- License Termination Plan (LTP)
 - Waste Volumes
 - Dose Modeling
 - Site Figures and Maps
- Communication Tools
 - NRC
 - Public Meetings
 - Website
- Final Status Surveys
 - Survey Maps
 - Sample Plans, etc...



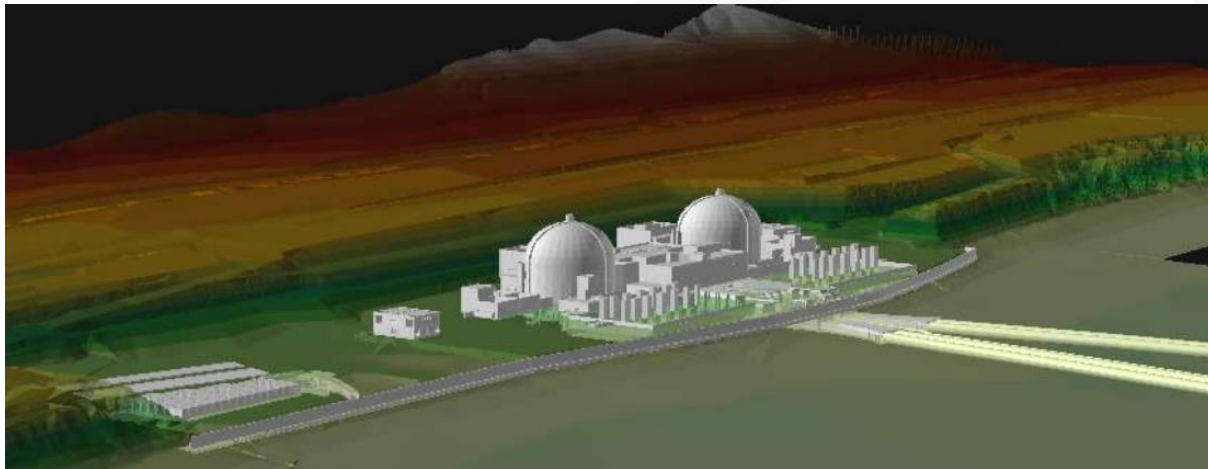
Final Thoughts

Develop Model in Pieces

Start before D&D

Model Uses will 'Evolve'

Stay Engaged





Questions?