

U.S. Nuclear Waste Technical Review Board  
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Virtual Meeting

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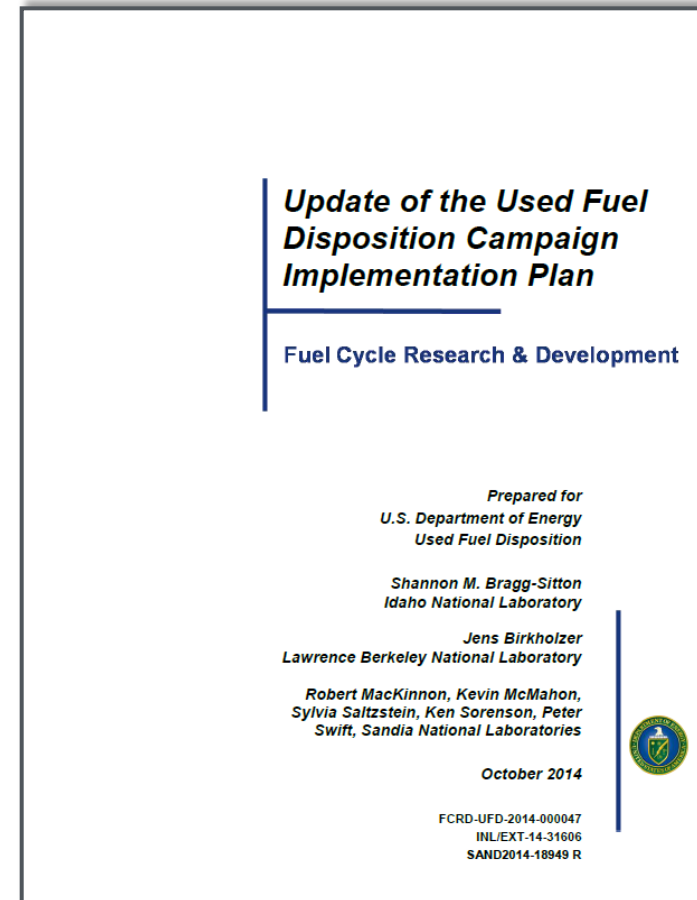
# Disposal Research Program Overview

- Program Mission and Purpose
- Disposal Concepts, Scope and Goals
- Conceptual Timeline
- Research & Development (R&D) Structure and Focus
- R&D Prioritization and Planning

# Disposal Research Program: Program Mission and Purpose

The mission of the Spent Fuel and Waste Science and Technology Disposition Campaign is to identify alternatives and conduct scientific research and technology development to enable storage, transportation and disposal of used nuclear fuel and wastes generated by existing and future nuclear fuel cycles.

Update of the Used Fuel Disposition Campaign Implementation Plan. FCRD-UFD-2014-000047, October 2014

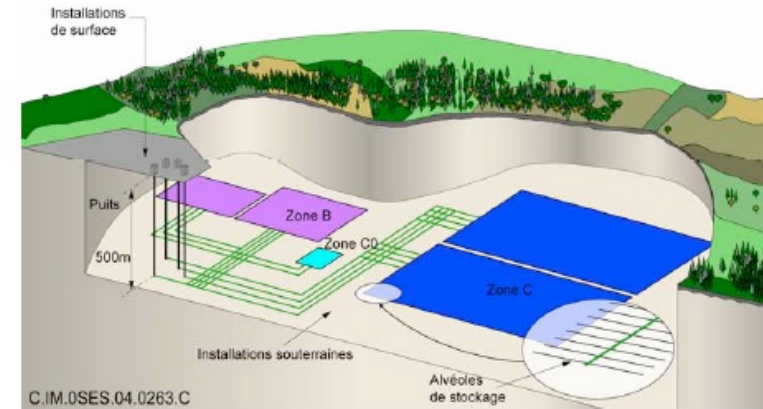
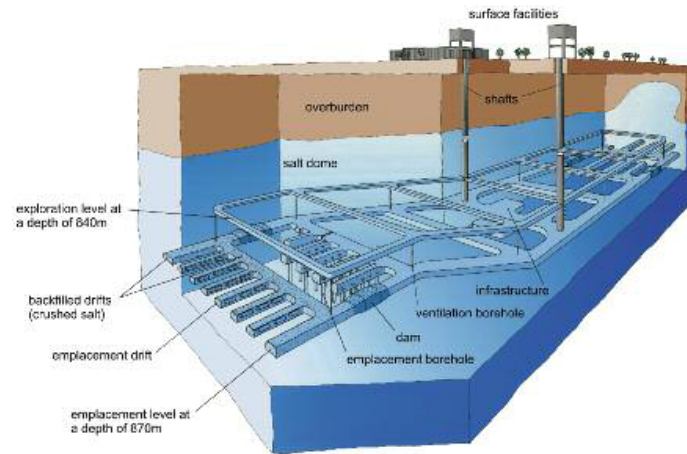


# Generic (Non-Site Specific) Disposal: Concepts, Scope and Goals

- Provide a sound technical basis for multiple viable disposal options in the US
- Increase confidence in the robustness of generic disposal concepts
- Develop the science and engineering tools needed to support disposal concept implementation
- Utilize international experience and develop U.S. program capabilities

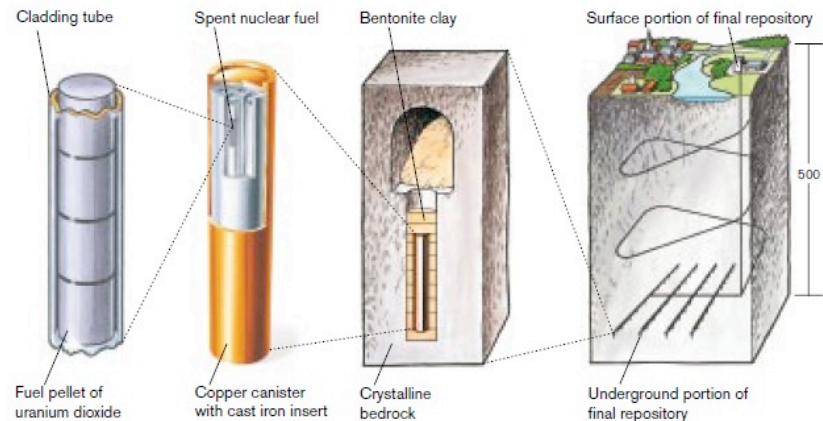
## Salt Repository Example

Gorleben, Germany (BMW 2008)



## Argillite Repository Example

Meuse/Haute Marne, France (ANDRA 2005)



## Crystalline Repository Example

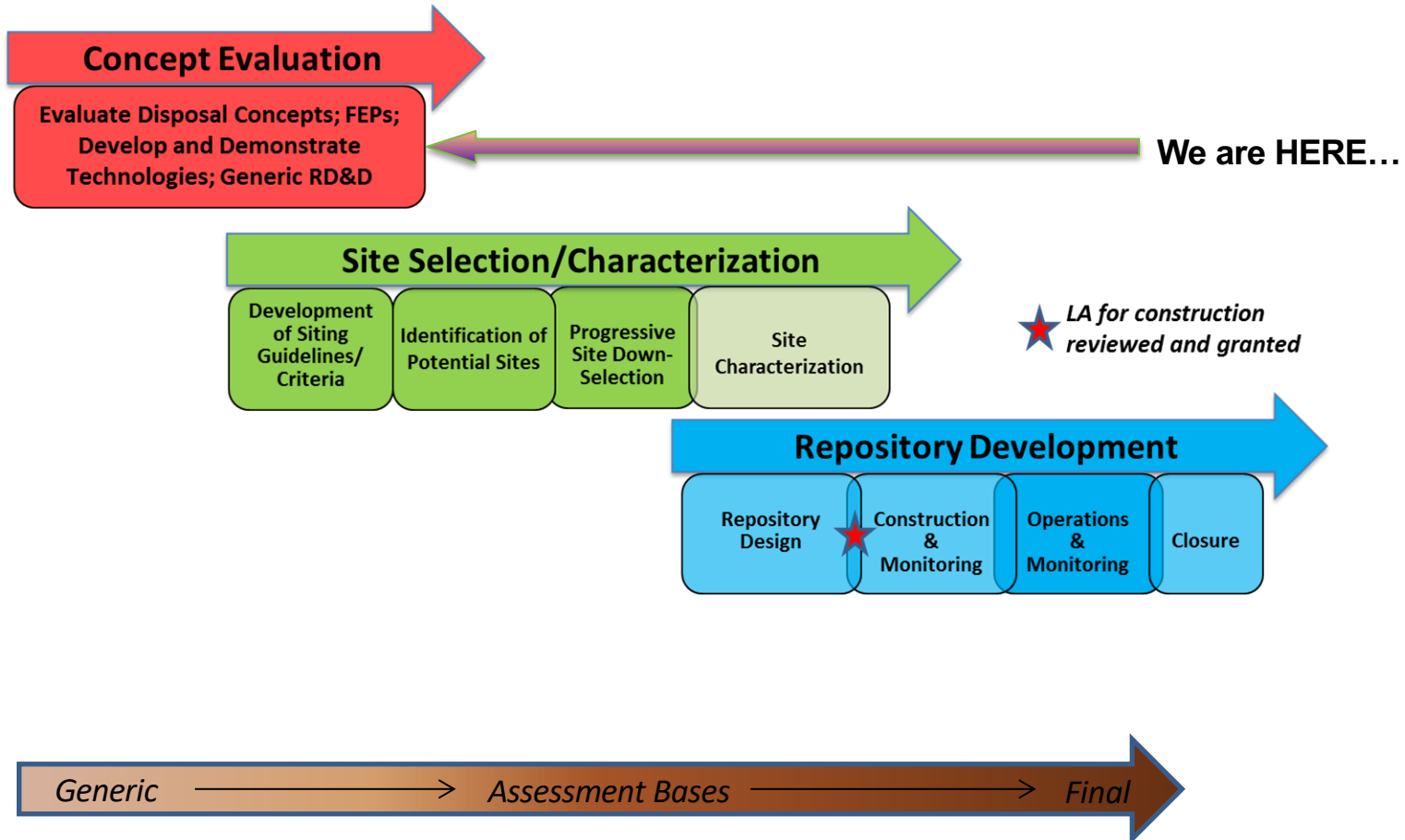
Forsmark, Sweden (SKB 2011)

- Deep Geologic Disposal Options
  - Spent nuclear fuel (SNF)
    - Commercial
    - DOE-managed
  - High-level nuclear waste (HLW) glass

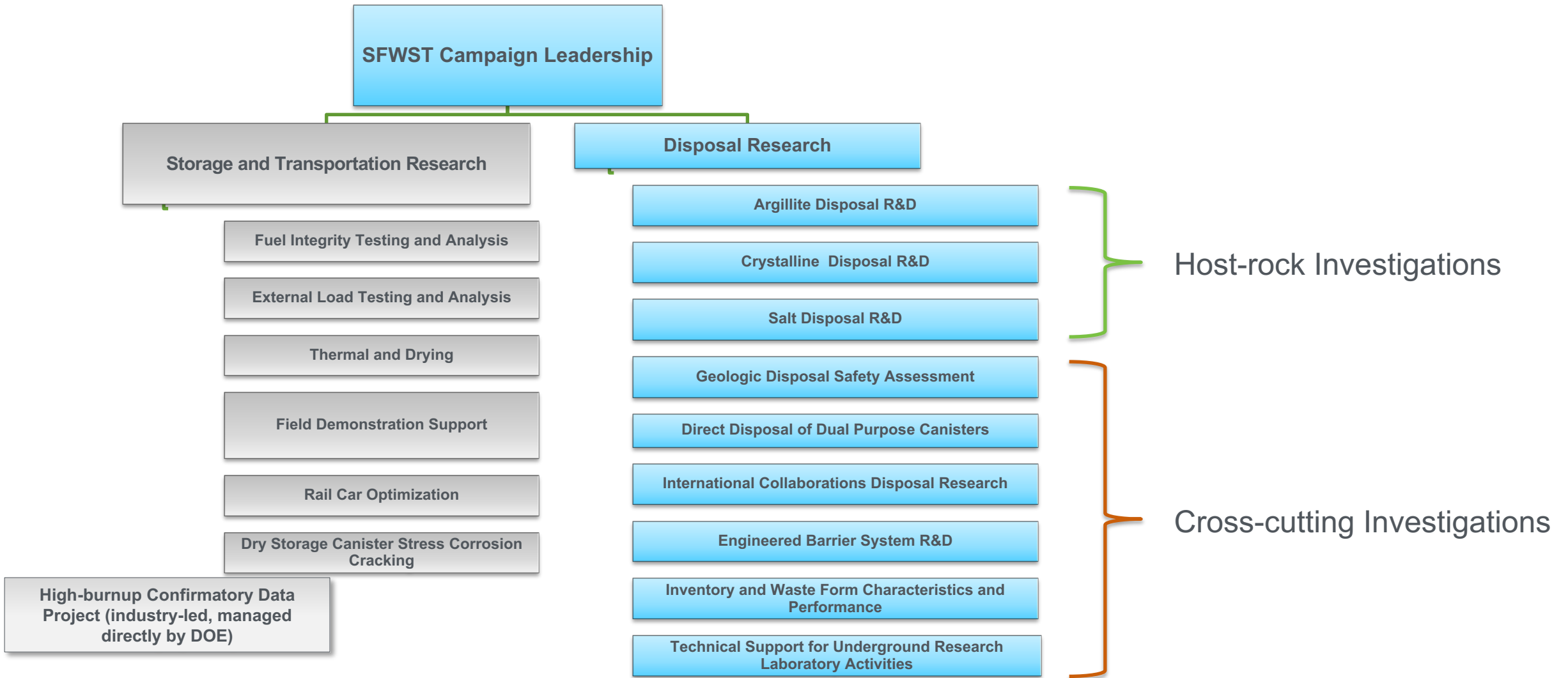
# Deep Geologic Disposal Programs World-Wide

Nation	Host Rock(s)
Finland	Granitic Gneiss
Sweden	Granite
France	Argillite
Canada	Granite, sedimentary rock
China	Granite
Russia	Granite, gneiss
Germany	Salt, other
USA	Salt (transuranic waste at the Waste Isolation Pilot Plant) Volcanic Tuff (Yucca Mountain)
<p>Others: Belgium (clay), Korea (granite), Japan (sedimentary rock, granite), UK (uncertain), Spain (uncertain), Switzerland (clay), Czech Republic (granitic rock), others including all nations with nuclear power.</p> <p>Modified from Faybishenko et al., 2016</p>	

# Disposal Research Program Conceptual Timeline



# FY 21 SFWST R&D Campaign Structure and Focus





# SFWST R&D Prioritization and Planning

- R&D Campaign Prioritization documents
  - Used Fuel Disposition Campaign Disposal R&D Roadmap (2012)
  - SWFST Campaign R&D Roadmap Update (2019)
  - SWFST Disposal Research R&D 5-yr Plan (2020)
- Congressional Appropriations
  - Funding levels
  - Appropriations Language
- DOE Management and Administration priorities
- Annual Baseline Planning



# References

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- Sassani, D., Birkholzer, J., Camphouse, R., Freeze, G., Stein, E., *SWFST Disposal Research R&D 5-Year Plan*, SAND2020-9053 R, July 31, 2020. Sandia National Laboratories, Albuquerque, New Mexico.
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