



300-296 Remote Soil Excavation Project



RICHLAND
OPERATIONS OFFICE
United States Department of Energy

**Hanford Advisory Board, River and Plateau
Committee Presentation**

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February, 6 2018



Agenda

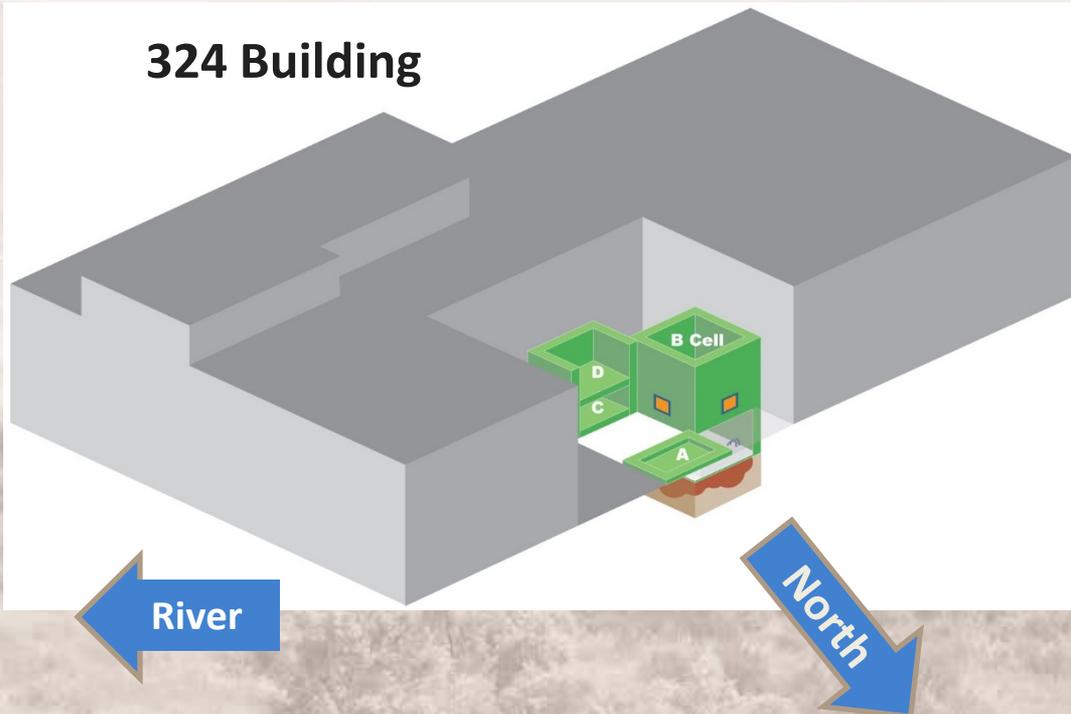
- Project Overview
- Proof of Concept/Risk Mitigation
- Mockup
- 324 Bldg. Prerequisites
- Airlock Cleanout
- Interference Removal/Cell Sealing
- Challenges
- Timeline





Project Overview

324 Building



Remote excavation of the 300-296 Waste Site beneath B-Cell (TPA M-016-085A) in support of future disposition of the 324 Building and further remedial actions of the 300-296 Waste Site.

Building 324:

- Surveillance and maintenance
- Support building prerequisites and activities for remote soil excavation project

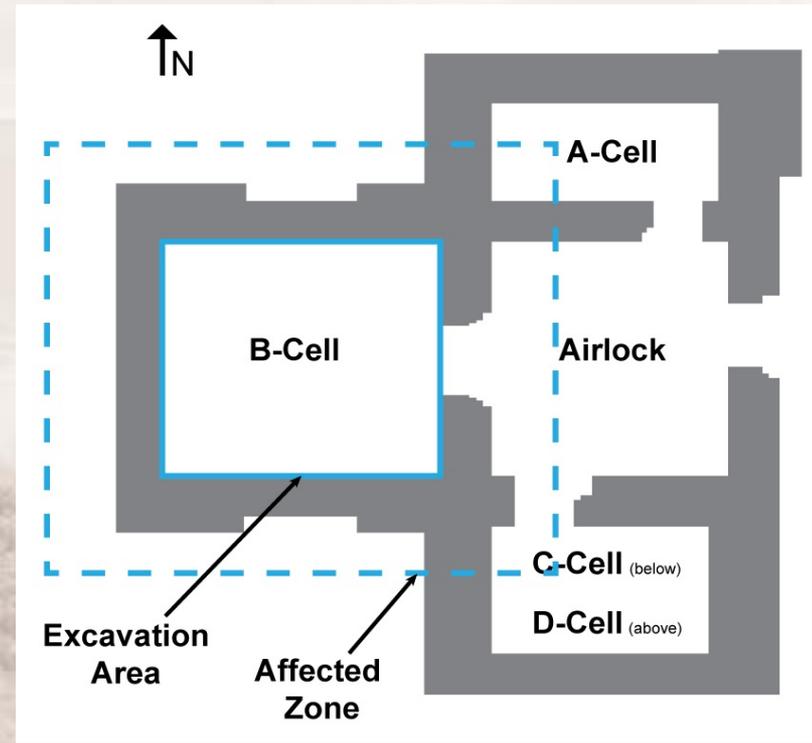
300-296 Soil Removal:

- Design, test, procure, construct, and operate the systems, structures, and components used to complete remote excavation of contaminated soil



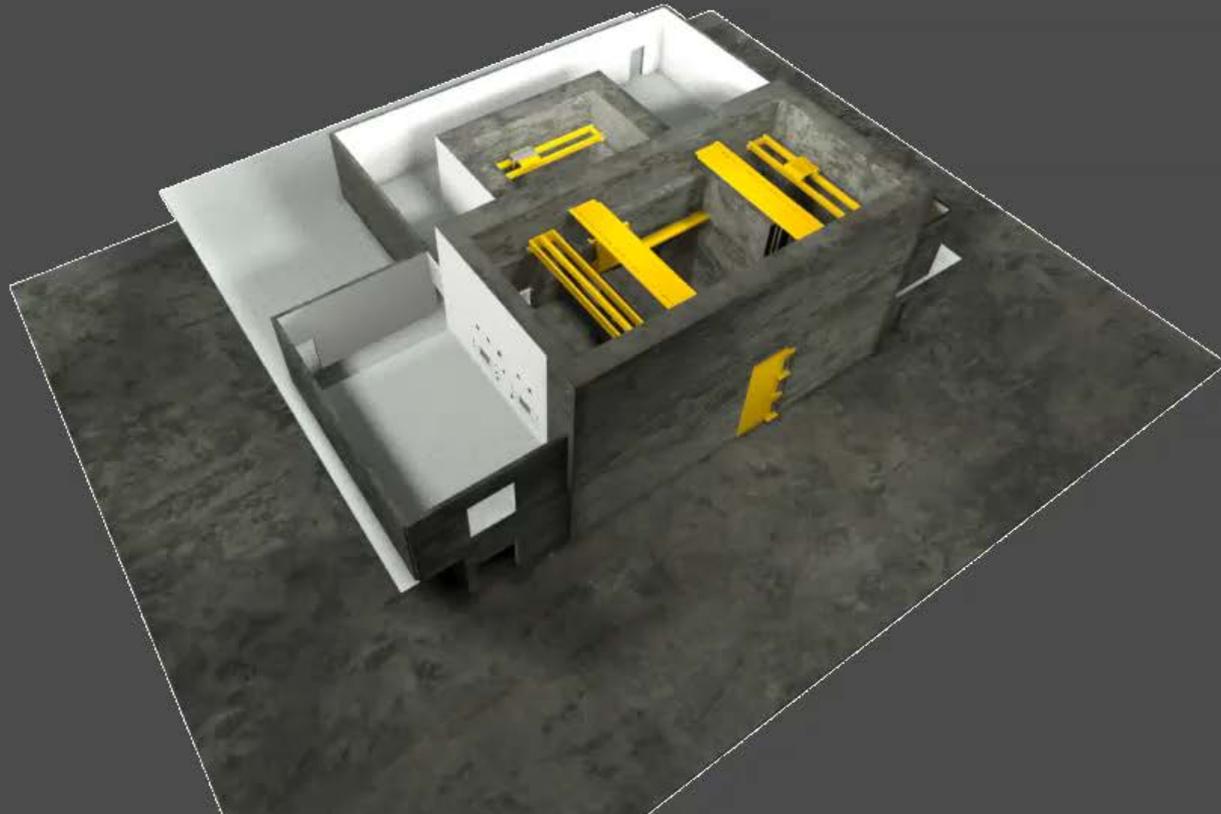
Project Overview (Cont.)

- Remotely excavate soil with facility intact and functional
- Excavate six to eight feet below B-Cell
 - Surveys and modeling indicate high radiation soils confined to ~six feet below cell floor
 - Remotely operated excavator capable of removing soil to 12 feet below B-Cell
- Highly radioactive soils will be placed in containers and placed in A, C and D Cells
- A, C, D Cells will be grouted into separate monoliths (large single blocks) for disposition with the building
 - Building demolition not in project scope
- Remaining excavated soil will be packaged, grouted and transferred for onsite disposal at the Environmental Restoration Disposal Facility (ERDF)
- Focused/active risk management



Strategy: Remove the Least Amount of Soil / Contamination Required for Conventional Remediation of 324 Building

324 Animation Video





Project Overview (Cont.)

Proof of Concept/ Risk Mitigation

Component testing

- ✓ Floor saw test
- ✓ Remotely operated impact device/seal breaker

Mockup

- ✓ Infrastructure/modifications
- Equipment design, procurement and install
- Testing/validation
- Procedures/training
- Proficiency development
- Readiness/operations support
- Demolition/remediation

324 Prerequisites

- Loose debris cleanout
- Interference removal
- Cell sealing
- Core drilling
- Structural modifications
- 324 Building equipment design, procurement and installation (long lead items started)

B-Cell Activities

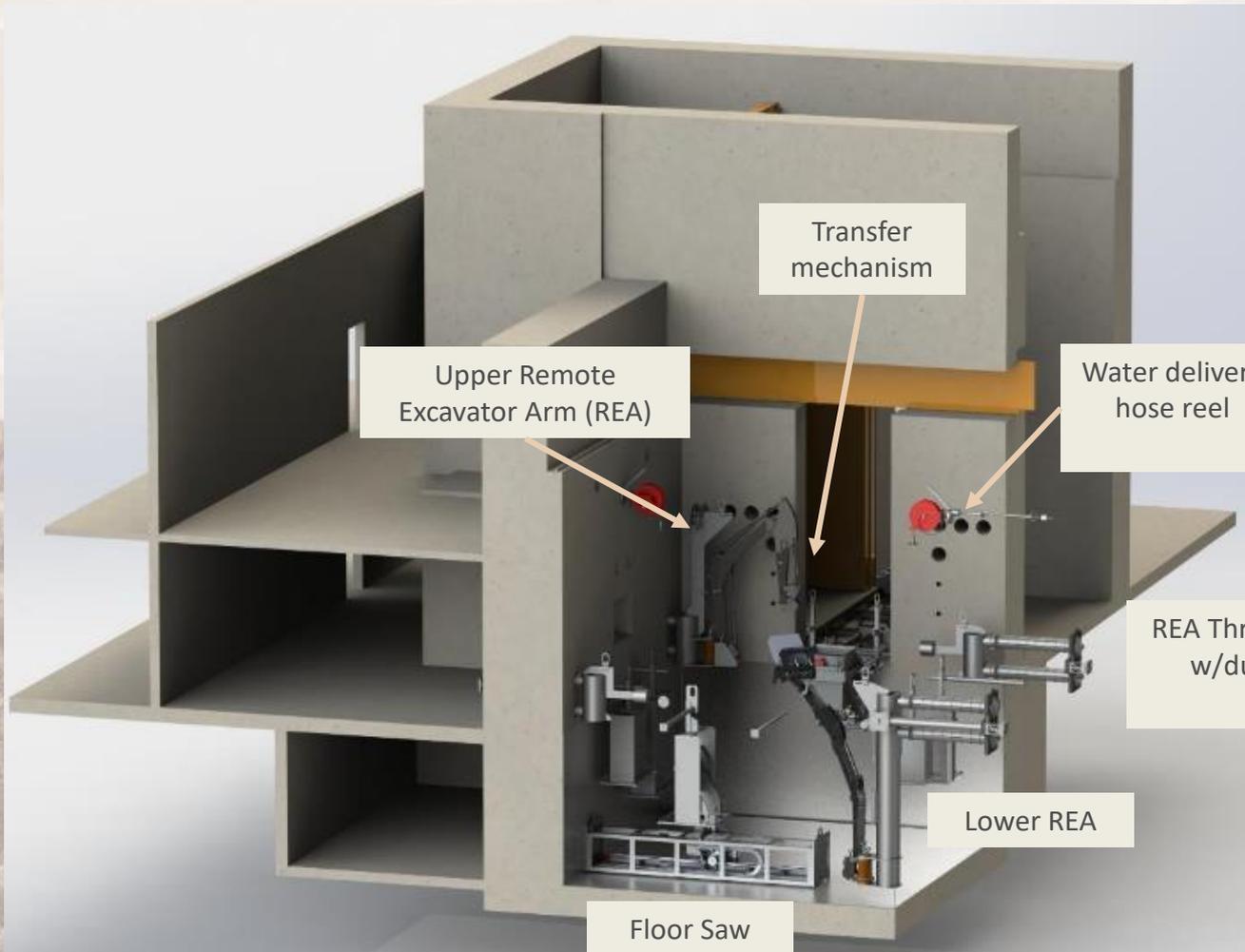
- Debris and grout cleanout
- Readiness
- Floor cutting/removal
- Soil removal
- Refill excavation with grout

Legend:

- Planned
- Started
- ✓ Completed



Project Overview - B-Cell Equipment Layout





Proof of Concept/Risk Mitigation



Mockup – Dry run activity for initial Airlock entry (July 2017)



Component Testing – Floor saw test at Maintenance and Storage Facility (March – June 2017)

Mockup



- Off-site full-scale replica of B-Cell and Airlock
 - Weather protected 80 feet x 100 feet test area
 - Overhead 10-ton crane
- Operations, training and crew trailers
- Intended use:
 - Equipment testing / validation
 - Work package / procedures development
 - Installation training
 - Remote equipment training
 - Proficiency development
 - Contingency/response planning
 - Readiness/operations support



Before (Jan. 2017) & after mods. (May 2017)





Mockup Progress

- Equipment installations to date
 - Master Slave Manipulators (MSMs)
 - Cameras and light mounting brackets



A-frame for installing MSMs (Nov. 2017)



Three MSMs successfully installed
(Dec. 2017)

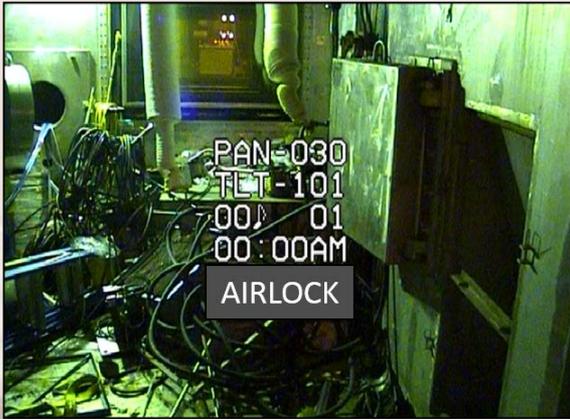


324 Bldg. Prerequisites

- Airlock / cell cleanout
 - Loose debris successfully removed from Airlock
 - Loose debris removal from cells is in progress
 - Seven ERDF roll-off containers and 11 large steel boxes of debris were removed
- Facility modifications
 - Interference removal, cell sealing and core drilling new penetrations are in progress
- Structural modifications
 - Design progressing with 30% design due February 2018
- Equipment procurement/installation
 - Procurements progressing
 - Installation at the Mockup has begun



Airlock Cleanout



Before cleanout (May 2017)



During cleanout



After cleanout (Nov. 2017)



B-Cell Interference Removal



Before (May 2017)



After (May 2017)



Airlock and C-Cell Entry

- Airlock entry
 - First entry in over 15 years made on April 10, 2017
 - Over 40 entries made to date
 - Access point for removing debris, installing equipment, and remotely remediating soil
- C-Cell entry
 - First person entry in over 15 years on December 7, 2017
 - Over 10 entries made to date
 - Debris cleanout is progressing



Entry Into C-Cell



Surveying debris
in C-Cell



Challenges

- First of a kind remote excavation of soil from within a hot cell
- Extremely high contamination/radiation levels
- 324 Building originally constructed in 1960s
 - Aging building equipment, systems and infrastructure
 - Unknown or unforeseen facility conditions that impact planning/execution
- Legacy facility operations and conditions
- Structural reinforcement of facility needed during soil excavation
- Soil removal equipment performance in the elevated radiation environment



Questions?

324 Video

