Risk Reduction
Oak Ridge National Laboratory

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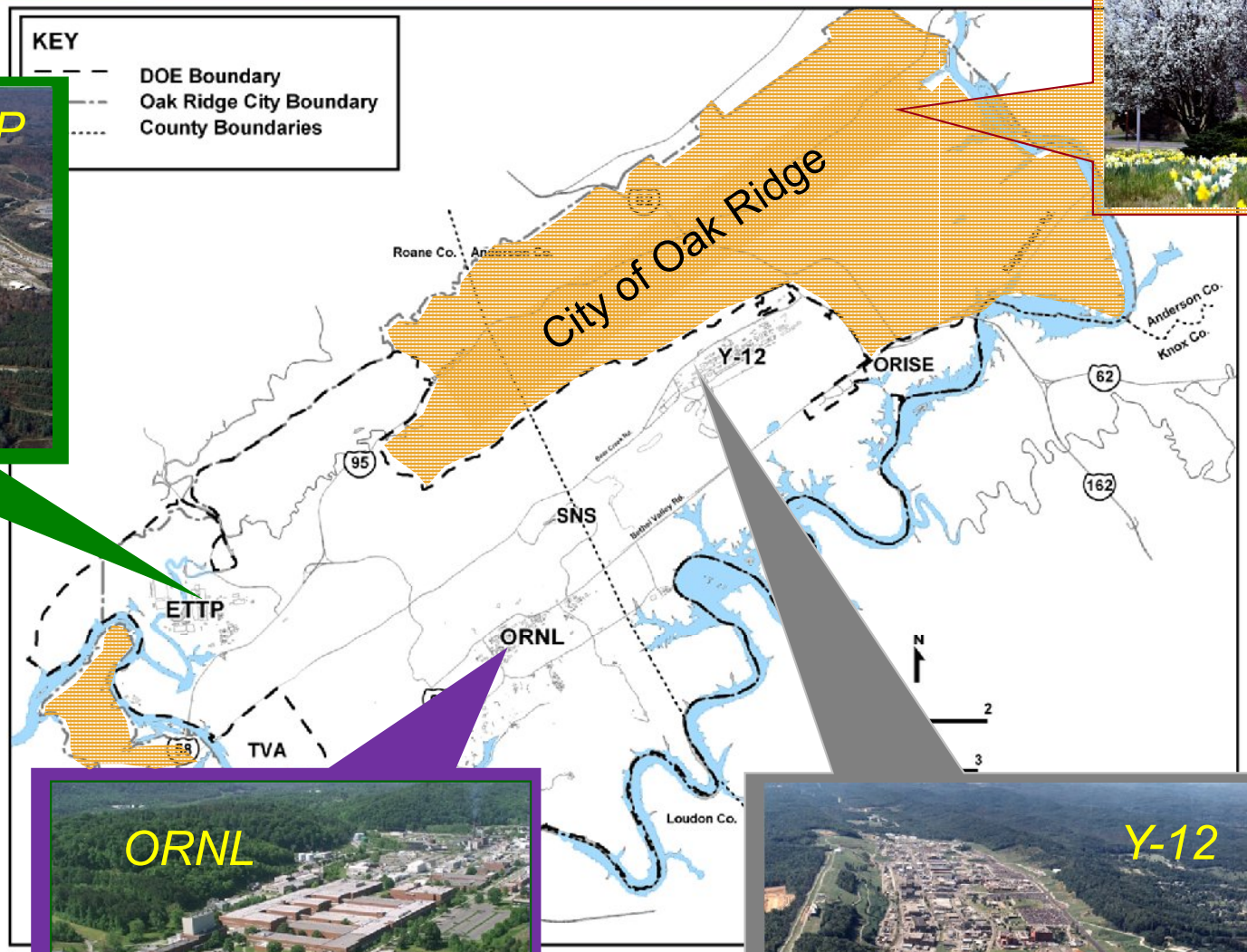
Moving to the Future by Cleaning up the Past

ORNL is the Department of Energy's largest science and energy Laboratory



Oak Ridge

MOVING TO THE FUTURE BY CLEANING UP THE PAST

ORNL is the Department of Energy's largest science and energy Laboratory

- $1.65 billion budget
- 4,650 employees
- 3,000 research guests annually
- $500 million invested in modernization

- Nation's largest concentration of open source materials research
- World's most intense pulsed neutron source and a world-class research reactor

- World's most powerful open scientific computing facility
- Nation's most diverse energy portfolio
- Managing the billion-dollar U.S. ITER project

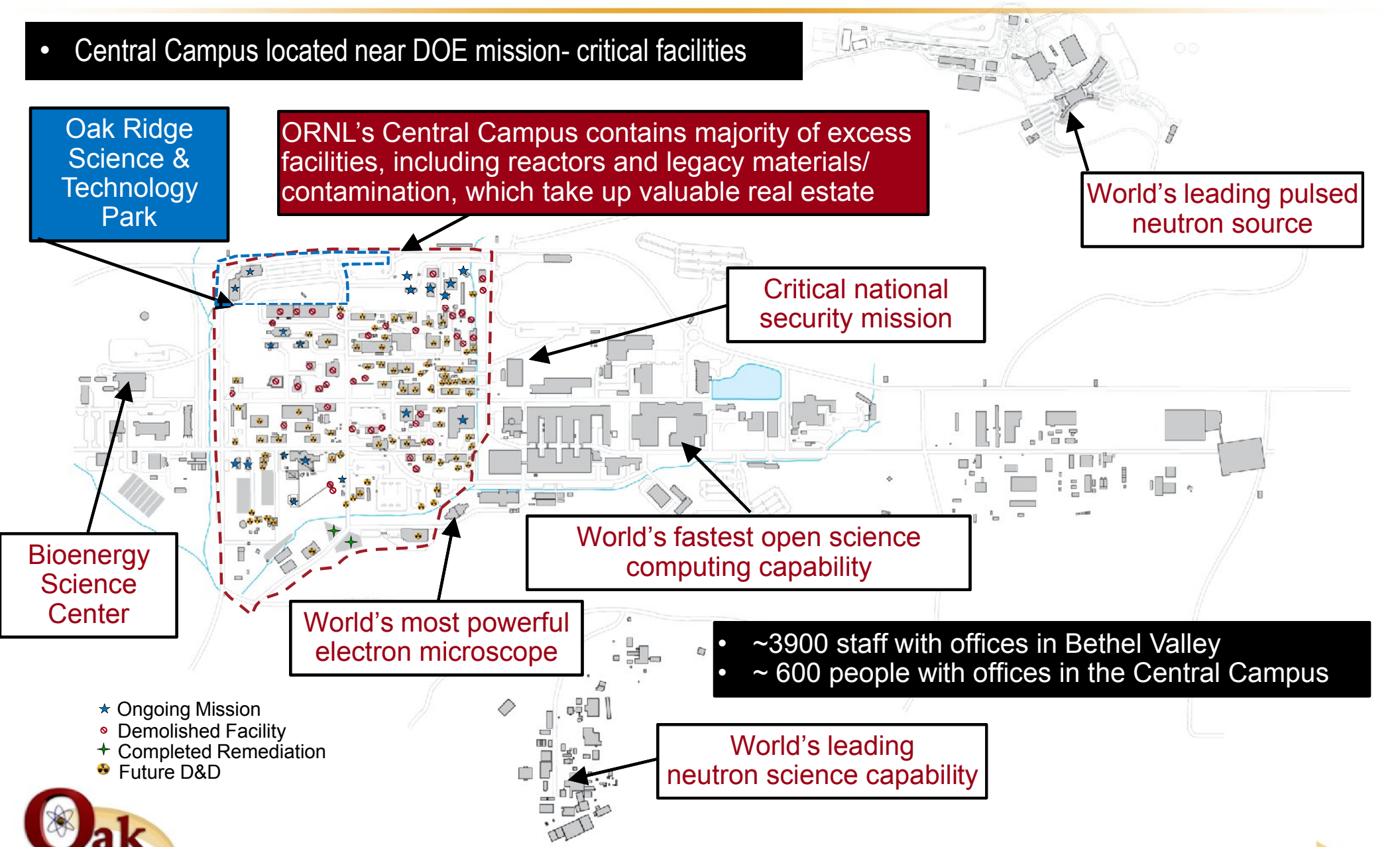
Modernization efforts have changed the ORNL landscape

ORNL's Central Campus is a high priority for Environmental Management

- Legacy material and aging excess facilities are a major risk to human health, safety, and continued mission and modernization efforts
  - ❑ *> 150 excess facilities, including 4 reactors and > 60 hot cells*
- > 2 MCi legacy radiological inventory

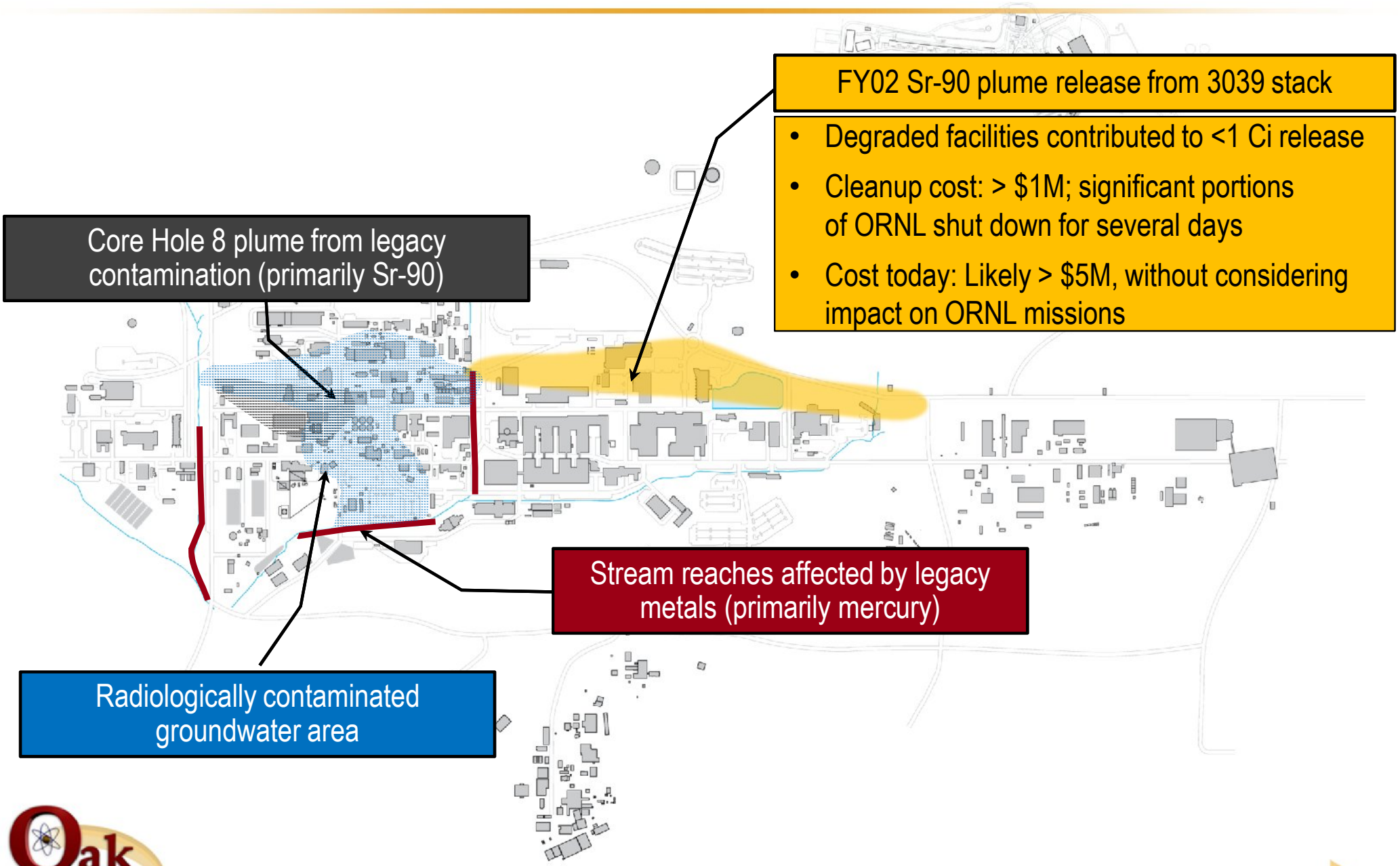
Legacy contamination risks are in a different context at ORNL

- Central Campus located near DOE mission- critical facilities



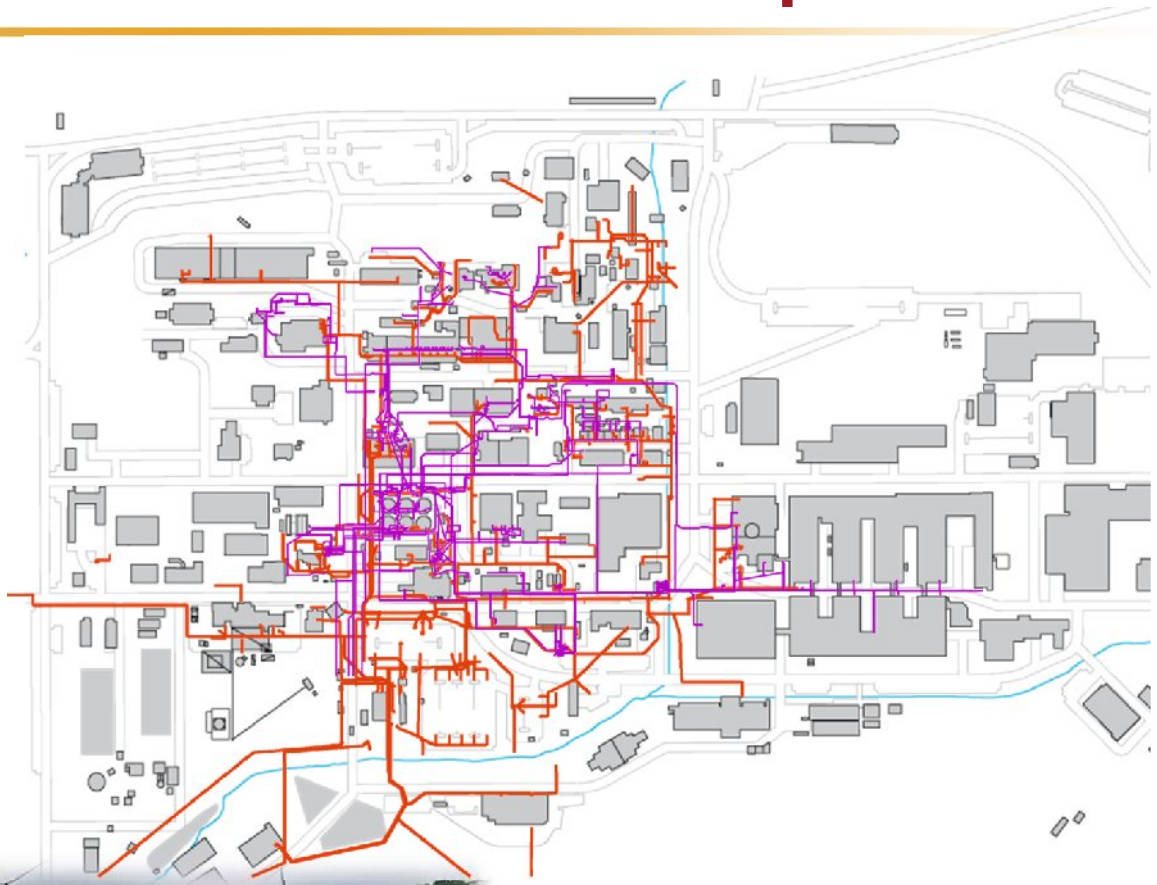
- ~3900 staff with offices in Bethel Valley
- ~ 600 people with offices in the Central Campus

Legacy inventory has been involved in prior contamination events

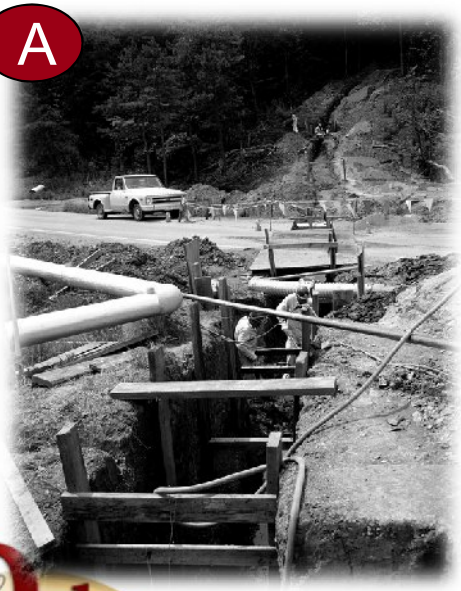


Failure of radiological liquid waste treatment systems would have significant environmental consequences

- Extensive underground liquid waste pipelines are contaminant sources (A)
- Even with 4 Ci/year of Cs-137 and Sr-90 removed in Process Waste Treatment System (B), 1.5 Ci/year is discharged offsite from legacy sources
- Bethel Valley Record of Decision: DOE-EM commitment to clean up ORNL



A



B

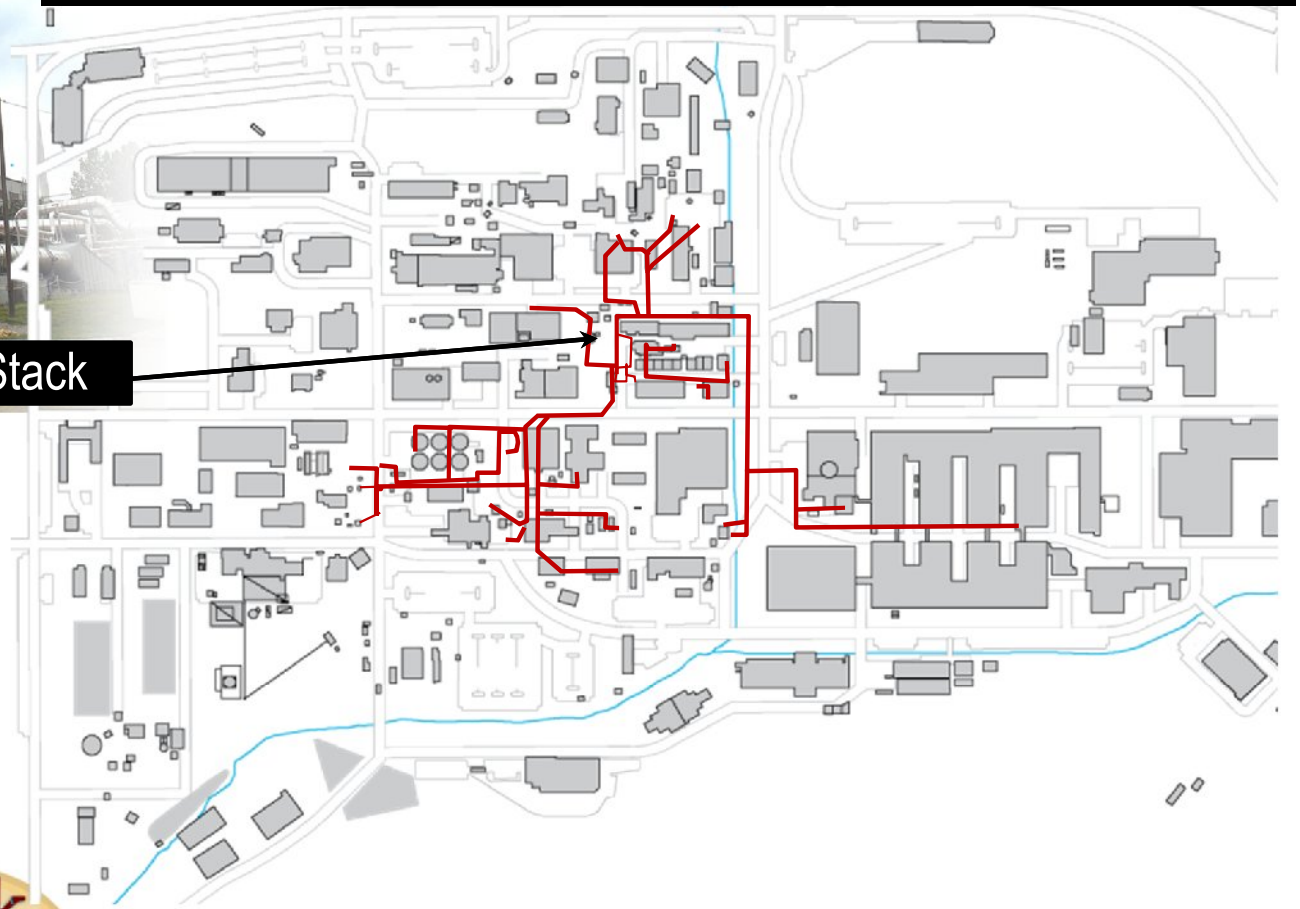
Liquid Low-Level Waste Lines

Process Waste Pipelines

Gaseous waste reconfiguration is a priority

- Buildings connected to 3039 Stack via Central Ventilation System or Hot Off Gas System
  - ❑ *16 Active*
  - ❑ *13 Inactive*
- Completed disconnects and reconfiguration in the 3026 area (A)
- Reconfiguration in the 4500 area is in process (B)

3039 Stack



Risk Reduction Efforts are Ongoing

- Integrated planning approach for risk reduction efforts at ORNL is ongoing
- American Recovery and Reinvestment Act allowed a "jump start" on risk reduction efforts
  - *Legacy material removal and excess facility D&D*
  - *Processing of legacy waste*
  - *Remedial actions associated with removal of building slabs, underground storage tank and contaminated soils*
  - *Reconfiguration of gaseous waste ventilation systems*
  - *Capping of existing burial grounds*

Additional risk reduction efforts

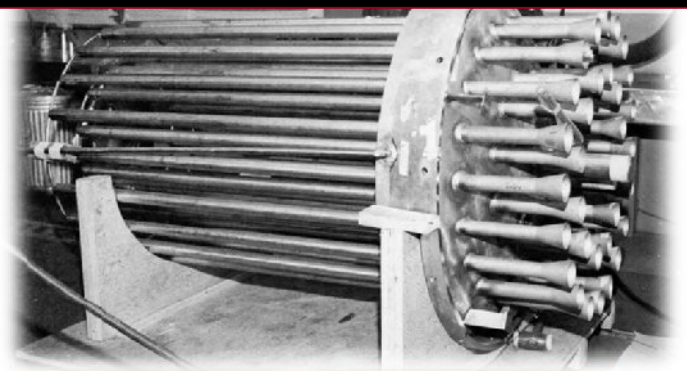
Building 3019: processing and shipping legacy U-233 materials

Transuranic Waste Processing Facility: processing/shipping legacy TRU waste off-site

Significant Challenges Ahead

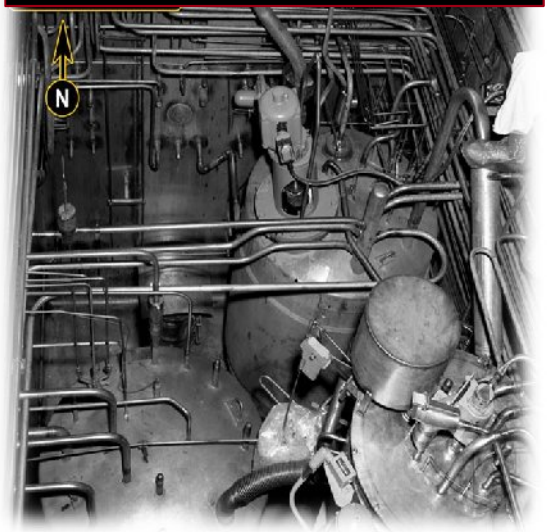
DOE-EM is committed to address major source terms that still exist at ORNL

Molten Salt Reactor Fuel Salt Storage Tank Thimbles

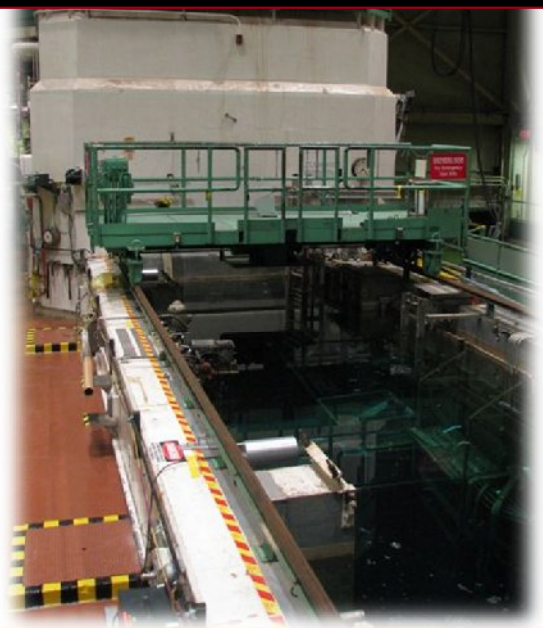


Homogeneous Reactor High Bay

Building 3517 Process Cell 5



Oak Ridge Research Reactor Pool



Bulk Shielding Reactor Pool

Summary

- Highest risks to off-site contamination are being addressed
- DOE-EM has completed a number of risk reduction projects over the last two decades (A & B)
- Objectives of remaining DOE-EM cleanup at ORNL
  - *Enable and protect DOE-SC ORNL missions*
  - *Eliminate risks to site population, the public, and the environment from failure of deteriorating contaminated facilities*
  - *Address the balance of contamination sources to ground water and surface water*

A **Gunite Tanks Remediation, circa 2000**

B **Surface Impoundment Operable Unit Remediation, circa 2000**

Future Vision of ORNL