U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

Environmental Management Waste Management

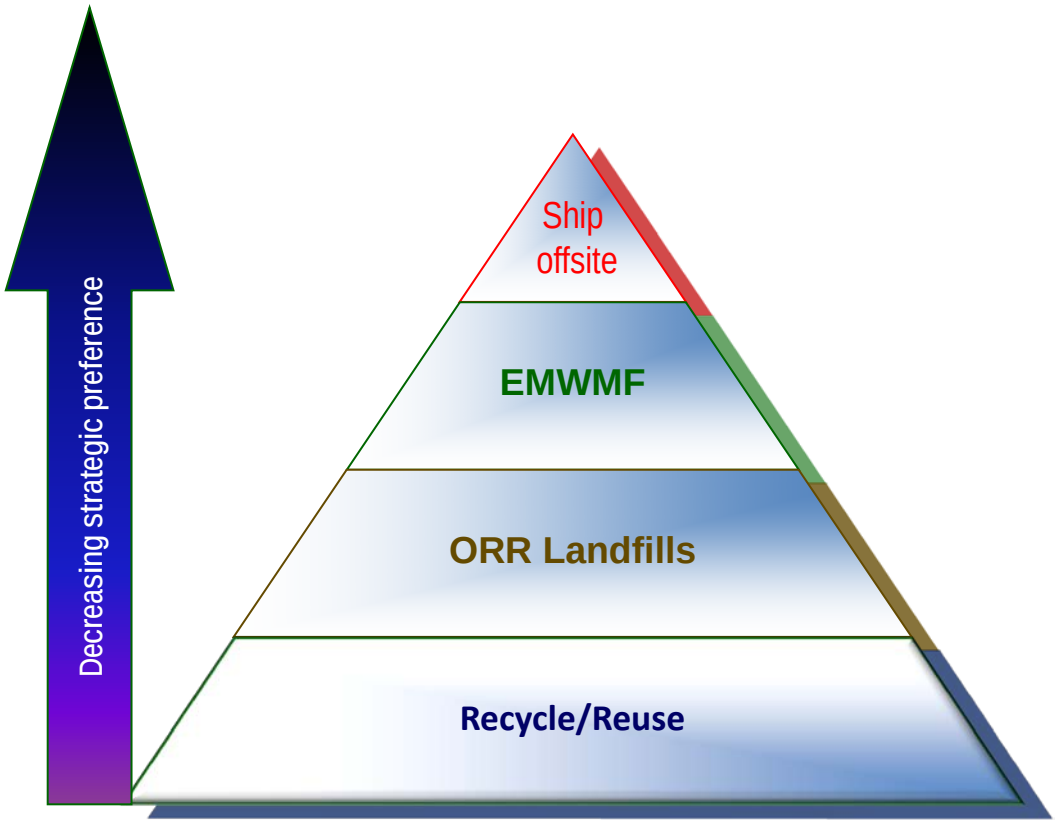
Brian DeMonia
Branch Chief, Safety, Security and Waste Management

Oak Ridge Office of Environmental Management (OREM)

The Environmental Management Program manages a diverse range of waste streams, with multiple disposition pathways

- **Non-Radiological/Non-Hazardous Waste**
  - Classified Landfill
  - Demolition Landfill
  - Industrial Landfill
  - Sanitary Landfill
- **Hazardous Waste**
  - Commercial Vendor
- **Toxic Waste**
  - Commercial Vendor
- **Liquid Low-Level Waste (LLLW)**
  - Commercial Vendor
  - Liquid Gaseous Waste Operations
- **Solid Low-Level Radiological Waste**
  - Commercial Vendor
  - Onsite Facilities
  - Other Department of Energy (DOE) offsite facilities
- **Transuranic (TRU) Waste**
  - Geologic disposal
- **Mixed Waste (Liquid)**
  - Commercial Vendor
- **Mixed Waste (Solid)**
  - Commercial Vendor
  - Onsite Facilities
  - Other DOE Offsite facilities

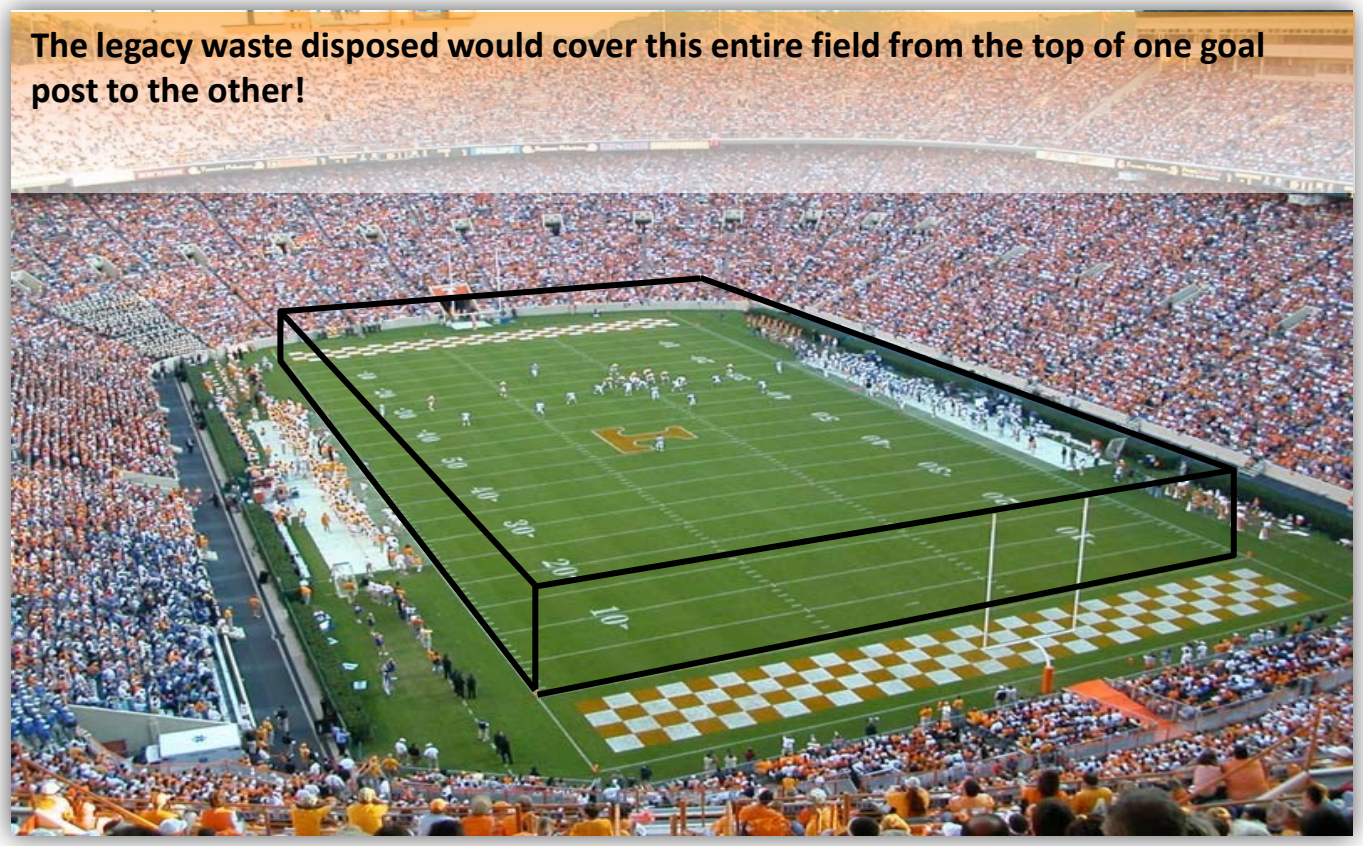
Efforts focus on reuse when possible, onsite disposal as appropriate, and offsite disposal when necessary



- Waste Hierarchy guides the disposal of waste generated at the Oak Ridge Reservation (ORR)
- The Environmental Management Waste Management Facility (EMWMF) receives CERCLA waste
  - includes low-level waste, Resource Conservation and Recovery Act (RCRA) hazardous waste, Toxic Substances Control Act waste, and mixed waste
- ORR Landfills receive sanitary waste
  - clean building debris, office trash, cafeteria waste
- Recycle/reuse is performed by the project

Significant Progress has been made dispositioning legacy wastes

- Mixed Low-Level Legacy Waste
- Legacy Mercury Waste
- Recycling Reusable Materials



Copper recycling is reducing the cost of Switchyard K-732 demolition

Liquid, Gaseous, and TRU Waste Management at the Oak Ridge National Laboratory (ORNL)

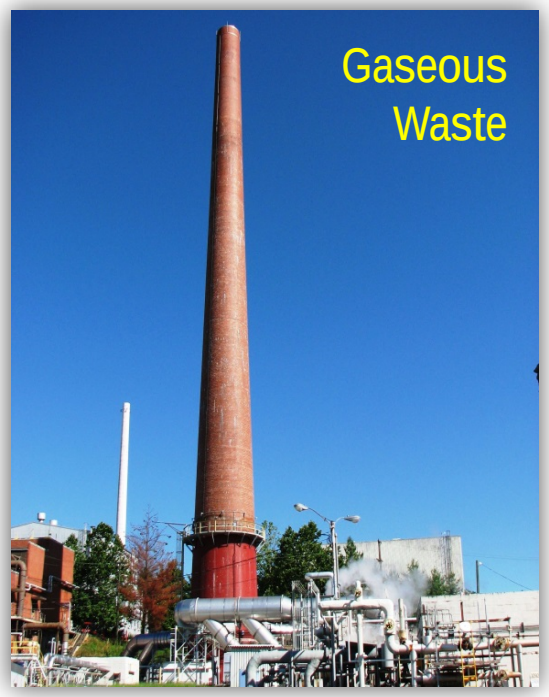
Bill McMillan

Portfolio Federal Project Director for ORNL

Oak Ridge Office of Environmental Management (OREM)

Liquid Gaseous Waste Operations (LGWO) facilities treat liquid and gaseous waste streams from OREM and the Office of Science operations

- LGWO comprised of 64 ORNL facilities and approximately 20 miles of piping
- Treats contaminated process water, groundwater and exhausts from building and laboratory ventilation
- Comprised of three waste treatment systems
  - Liquid Low-Level Waste System (120,000 gals/yr)
  - Process Waste System (110M gal/yr)
  - Gaseous Waste System (100,000 CFM flow)



LLLW System treats highly contaminated liquid wastes from ORNL operations

- The LLLW System consists of a series of dedicated tanks and underground piping used to collect LLLW from generating facilities at ORNL
- Waste is transferred to the LLLW Evaporator Facility for volume reduction
- Overheads from the evaporator are treated at the process waste treatment complex
- The concentrated LLLW is then transferred to storage tanks in the Bethel and Melton Valleys for long term storage
- Process up to 120,000 gals/year

LLLW Collection Facility Bldg 2099

LLLW Collection Facility Bldg 7966

The Process Waste System treats lightly contaminated wastewater and groundwater

- Collects wastewater from ORNL generators throughout Bethel and Melton Valleys and ground water from remediation sources using a series of single-contained hard-piping and pumping stations
- Pumping stations transfer the wastewater to a tank farm in each valley, where wastewater is stored until transferred to the Process Waste Treatment Complex
- Treatment provided at two facilities:
  - Building 3608 (Non-Radiological Processing)
  - Building 3544 (Radiological Processing)
- Treats approximately 110 million gallons per year and including approximately 2 million gallons of leachate water from EMWMF via tanker shipments

The Gaseous Waste System provides ventilation services to the ORNL complex in Bethel Valley

Centralized ventilation is provided from five separate building areas in the central area of the ORNL campus

- Cell Ventilation System – Large Volumes/Small Radioactivity
- Hot Off-Gas System – Small Volumes/Higher Radioactivity
- Release through 3039 Stack at ~100,000 Cubic Feet per Minute

The TRU Waste Processing Center (TWPC) manages the treatment and disposal of legacy and newly generated TRU waste

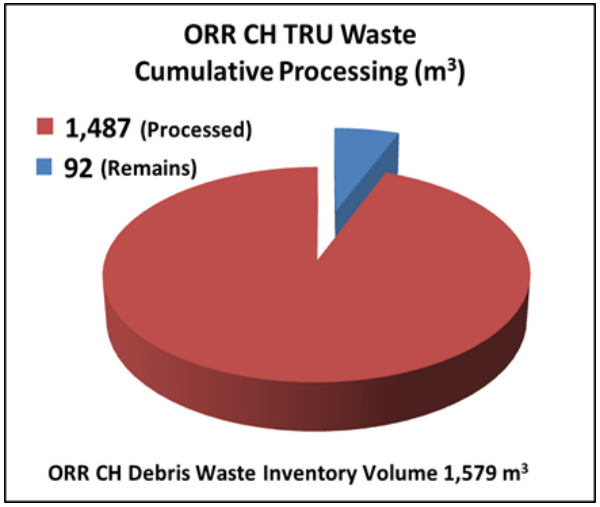
- TRU wastes are long-lived radioactive wastes that require disposal in a geologic repository
- TWPC is a RCRA permitted facility that characterizes and packages TRU waste
- Wastes are sorted, characterized, and packaged to result in stable waste forms that can be permanently disposed at the approved final repository
- TRU waste is disposed of at the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico
- Low-Level Waste and Mixed Low-Level Waste is disposed of at the Nevada National Security Site

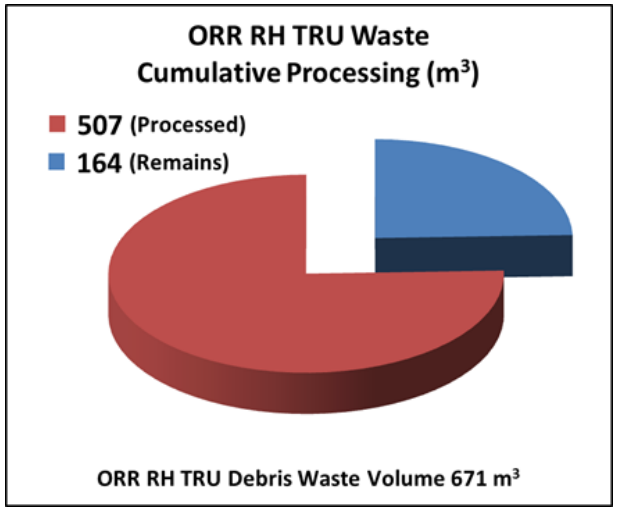
CH Waste Glovebox

RH Waste Hot Cell

The Oak Ridge TRU Waste Program is making good progress processing and dispositioning legacy TRU waste

- Contact Handled (CH) TRU waste processing and disposal status:
  - 94% processed
  - 66% shipped to permanent disposal
- Remote Handled (RH) TRU waste processing and disposal status:
  - 76% processed
  - 25% shipped to permanent disposal





Oak Ridge response to WIPP suspension allows continued operations

- Implemented Oak Ridge Response Plan to resolve extended CH/RH TRU waste storage
  - Utilized ORNL legacy TRU waste storage areas at Melton Valley to supplement TWPC storage capability
  - Deployed critical RH storage capacity through design and manufacture of specialty 72B canister over-packs
- Continued CH/RH waste processing to meet regulatory milestones
- Continued field deployment of the Central Characterization Project to allow for TRU waste certification
- Creates certified waste ready to ship when WIPP resumes operations

ORNL Legacy CH TRU Waste Storage

RH 72 B Canister Over-Pack

Oak Ridge Reservation Y-12 Area Landfills

Brian Henry

Acting Portfolio Federal Project Director for Y-12

Oak Ridge Office of Environmental Management (OREM)

Multiple landfill operations at Y-12 are in place to manage ORR waste streams

Waste Disposal Facility	Waste Received
EMWMF	CERCLA waste to include legacy mixed low-level radiological cleanup waste
Classified Industrial Landfill	Industrial waste
Industrial Landfill	Industrial waste
Construction/Demolition Landfill	Construction/demolition debris

Availability of onsite disposal capacity for low-level waste (EMWMF) has been critical to the cleanup program's success

- 28-acre landfill that opened in 2002
- Approved by the Environmental Protection Agency and the Tennessee Department of Environment & Conservation in 2000
- Receives low-level radiological and hazardous waste from CERCLA cleanup of ORR and associated sites
- Approximate capacity of 2.18 million cubic yards
- Approximately 70% of the capacity has been used
- Landfill water is collected, treated as necessary, and discharged

Disposal capacity for classified waste is in place to support clean up

- EMWMF can take classified contaminated waste
- A separate 4-acre landfill opened in 1989 receives sensitive waste from ORR sites
- Permitted capacity of 89,000 cubic yards
- Approximately 16% of the capacity has been used
- Leachate that is collected from the second, larger area, meets City of Oak Ridge sanitary sewer criteria and is discharged to the sanitary sewer lines at Y-12

An industrial/sanitary landfill on Chestnut Ridge serves all three Oak Ridge sites

- 26-acre landfill that opened in 1994
- Receives office trash, cafeteria waste and other sanitary waste from the ORR sites
- Can accept minimally contaminated demolition waste
- Approximate capacity of 2.1 million cubic yards
- Approximately 40% of the capacity has been used
- Leachate that is collected meets City of Oak Ridge sanitary sewer criteria and is discharged to the sanitary sewer lines at Y-12

A construction/demolition landfill also exists on Chestnut Ridge

- 30.4-acre site that opened in 2001
- Receives uncontaminated debris from building construction and demolition
- Approximate capacity of 2.08 million cubic yards
- Approximately 42% of capacity has been used