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

Transportation in Environmental Cleanup

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Southern States Energy Board
Joint Meeting of the Radioactive Materials Transportation Committee and the Transuranic Waste Transportation Working Group
December 9-10, 2015

Discussion Topics

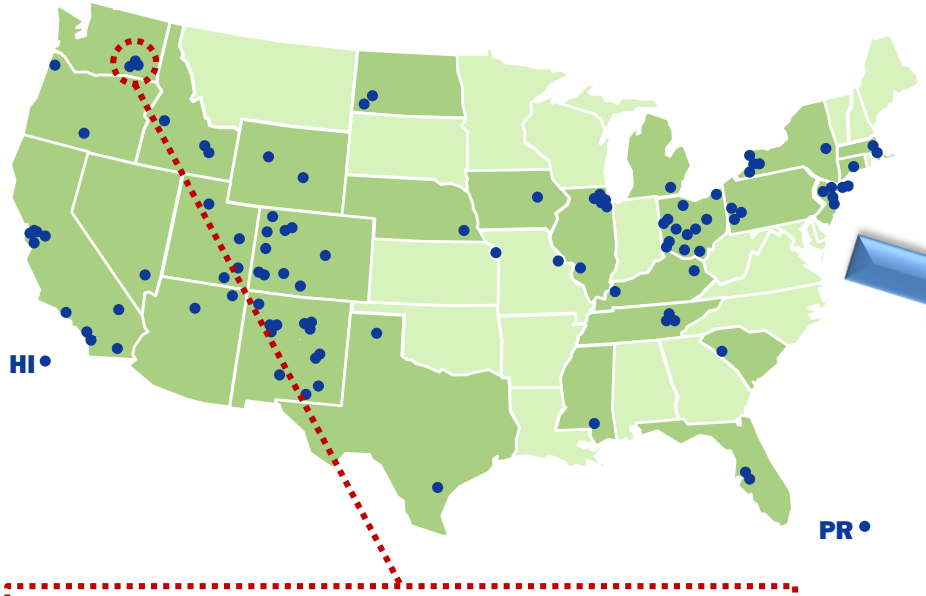
- Environmental Management Cleanup and Transportation Activities
  - Updates by Site
  - LLW/MLLW Update
  - Transportation Data
- Office of Packaging and Transportation Activities
  - Transportation Practices
  - Packaging Certification
- Discussion

EM Cleanup Program

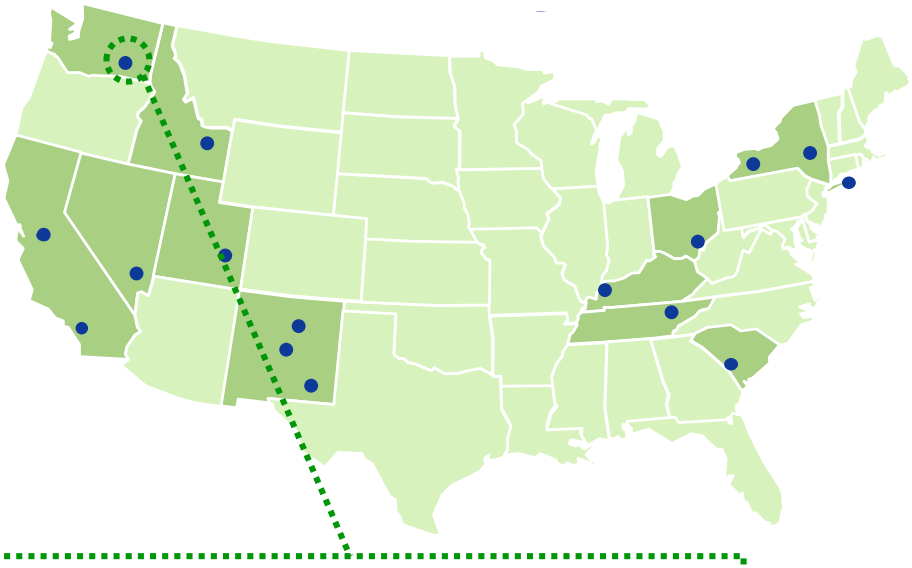
EM is an operational federal program performing a wide variety of tasks to clean up the environmental legacy of the U.S. nuclear weapons complex:

Cleaning Up the Environmental Legacy of the Cold War

EM Historical Cleanup Sites (107)



Sites Remaining Today (16)



Hanford 300 Area. Pre-Cleanup

Hanford 300 Area, Post-Cleanup

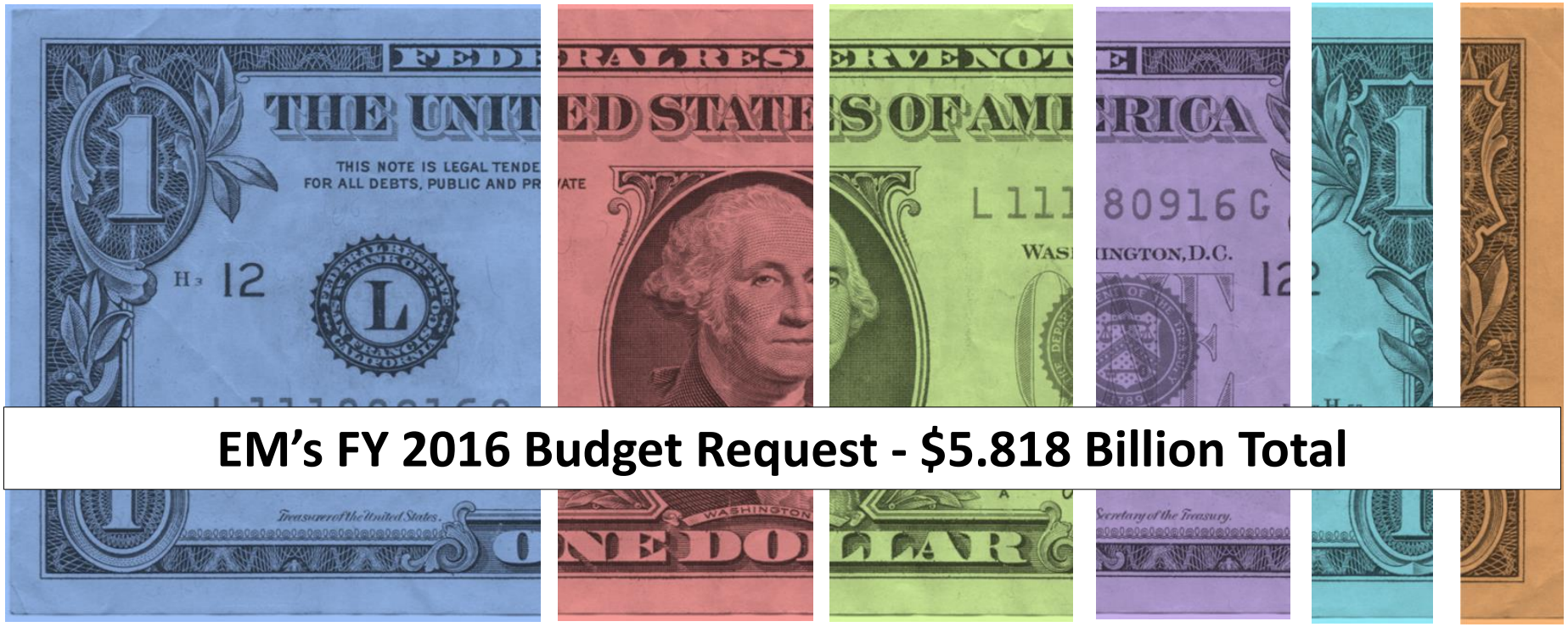
OFFICE OF ENVIRONMENTAL MANAGEMENT

Waste Management Activities Comprise Half of EM Budget

Radioactive Tank Waste
$ 2,297M / 39%

Facility D&D
$ 835M / 14%

Soil and Groundwater
$ 527M / 9%



EM's FY 2016 Budget Request - $5.818 Billion Total

Special Nuclear Materials and Used Nuclear Fuel**
$ 967M / 17%

Transuranic & Solid Waste
$ 779M / 13%

Site Services*
$ 413M / 7%

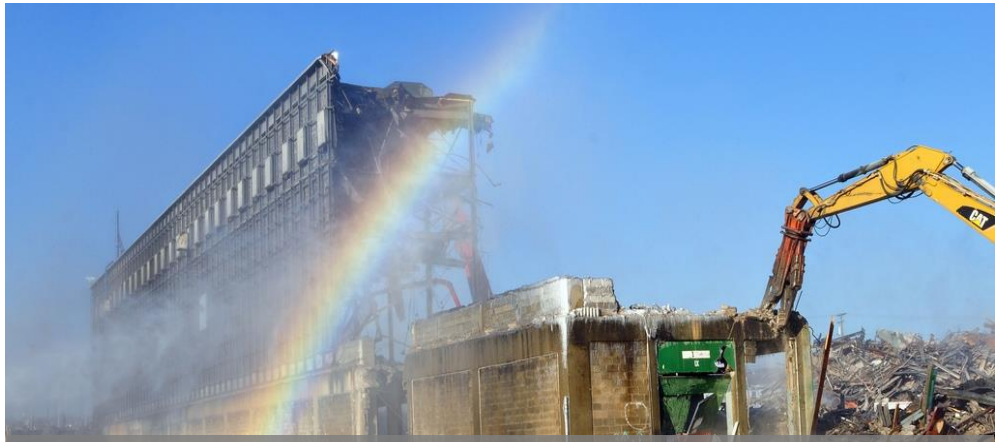
*Includes Program Direction, Program Support, Technology Development & Deployment, Post Closure Administration and Community and Regulatory Support

**Includes Safeguards and Security

Waste Disposition Updates by Site

CLEANUP SITES

Oak Ridge



Final Demolition of K-25 Facility (TN)

East Tennessee Technology Park (TN)

Portsmouth and Paducah

Ports. Gas. Dif. Plant (OH)

Installation of Treatment System (KY)

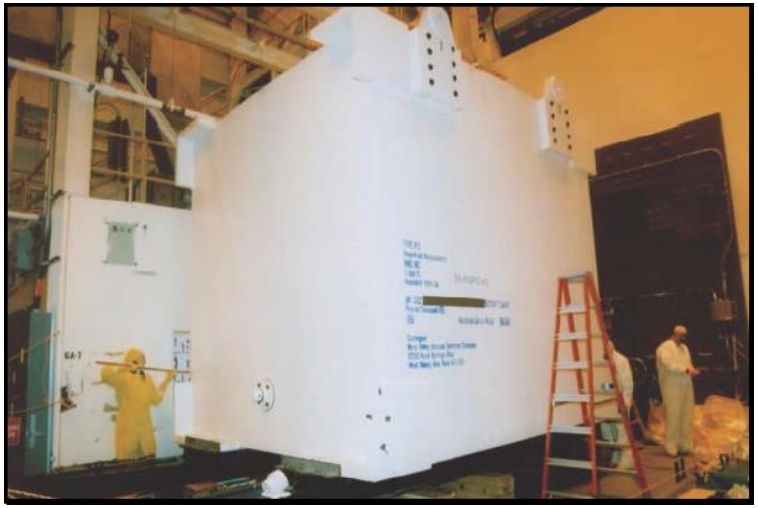
Paducah Gaseous Diffusion Plant (KY)

Savannah River

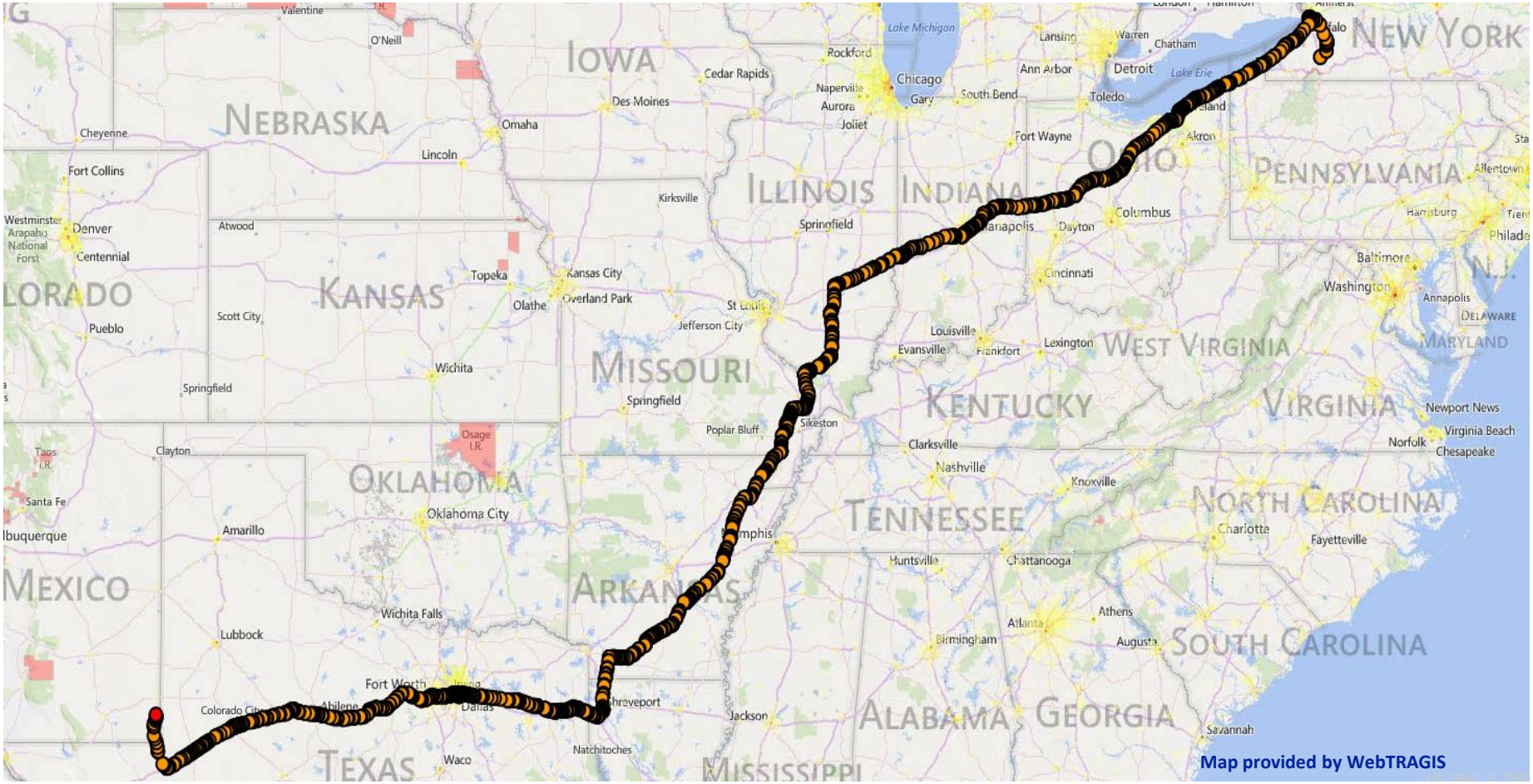
Defense Waste Processing Facility (SC)

H Canyon Facility (SC)

West Valley Vitrification Melter



Example West Valley Melter Shipment Route



Map provided by WebTRAGIS

The route is rail except for the intermodal transfers in New York and New Mexico/Texas and is subject to change since the Transportation Plan for the shipment has not been completed.

Liquid Tank Waste Sites

Integrated Waste Treatment Unit (ID)

Waste Treatment and Immobilization Plant (WA)

Defense Waste Processing Facility (SC)

Nuclear Materials and Spent Nuclear Fuel

DUF6 Facility (KY)

K-West Spent (Used) Nuclear Fuel Basins (WA)

- Oak Ridge, TN
- Richland, WA
- Paducah, KY and Portsmouth, OH
- Savannah River Site, SC

Low-Level Waste/Mixed Low-Level Waste Update

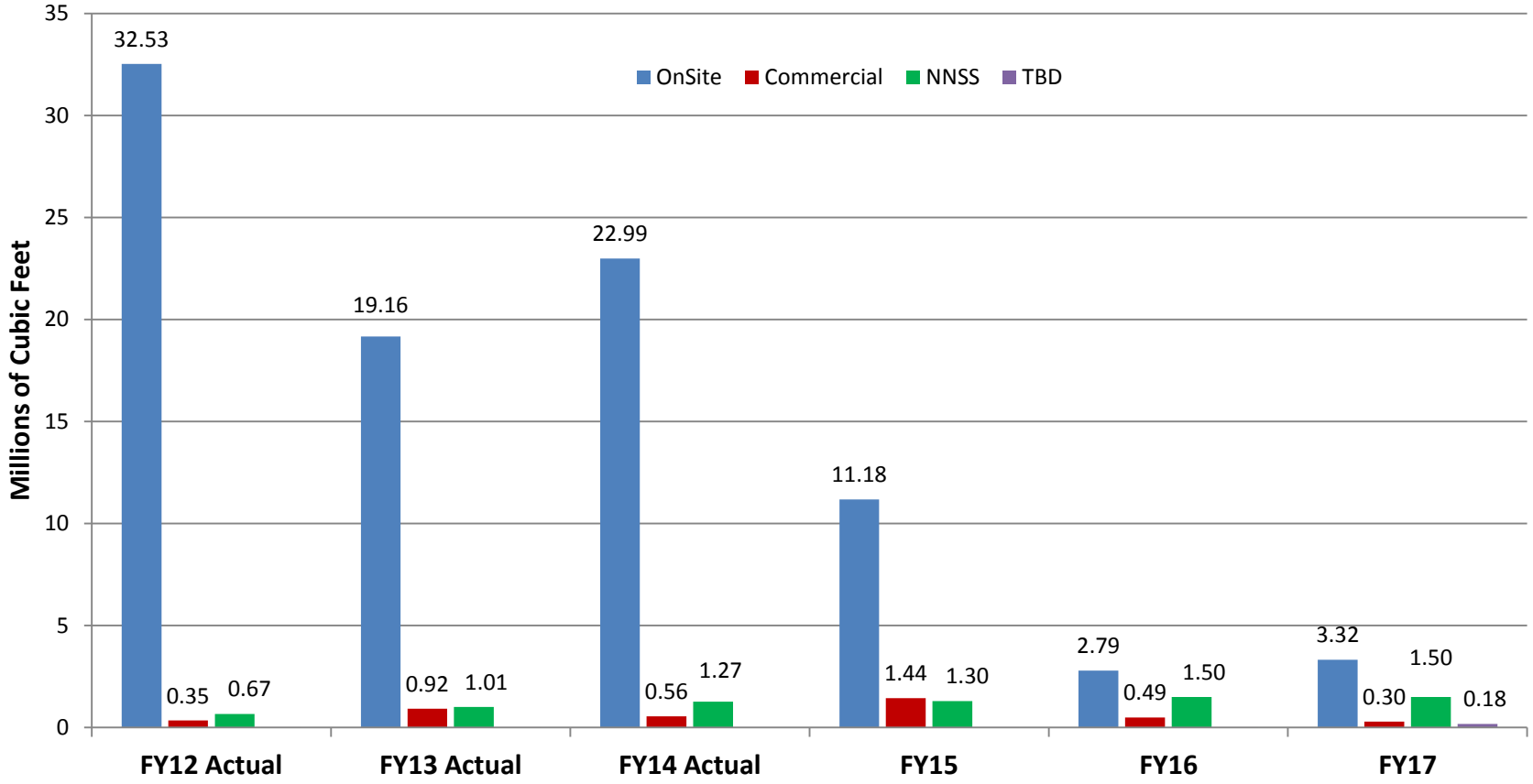
DOE's Unique Waste Management Mission

- Authority and responsibility for management of all DOE-generated waste under authority of the Atomic Energy Act, as amended
- Clear distinction between DOE and non-DOE waste in Low Level Waste Policy Amendments Act

DOE LLW/MLLW Management Policy

- DOE Order 435.1, Radioactive Waste Management, with associated guidance, provides policy and requirements for DOE Waste Management
- Current LLW disposal policy:
- Exemption documentation includes annual facility reviews, life-cycle cost analysis, etc.
- DOE on-site (~90% by volume), DOE off-site (~5% by volume), and commercial disposal (~5% by volume)
- DOE generally does not utilize State compact facilities for disposal of LLW/MLLW

DOE LLW/MLLW Disposal Rates by Location



FY15 NNSS Disposal

Generator Site	*FY 2015 Actual (m3)	Projected FY 2015 (m3)
Portsmouth GDP (OH)	15399	18254
Oak Ridge Reservation (TN)	3583	4247
Oak Ridge NNSA/Y-12 (TN)	3353	3975
Los Alamos National Lab (NM)	942	1117
Idaho Site (ID)	3566	4227
Livermore Nat'l Lab (CA)	1294	1534
Paducah GDP (KY)	155	184
NNSA/Nuclear Fuel Services (TN)	1119	1326
Onsite NNSS (NV)	378	448
Savannah River (SC)	15	18
West Valley (NY)	257	305
All other sites	1622	1923
Total	**31683**	**37557**

Forecasting supports operational planning and is updated quarterly

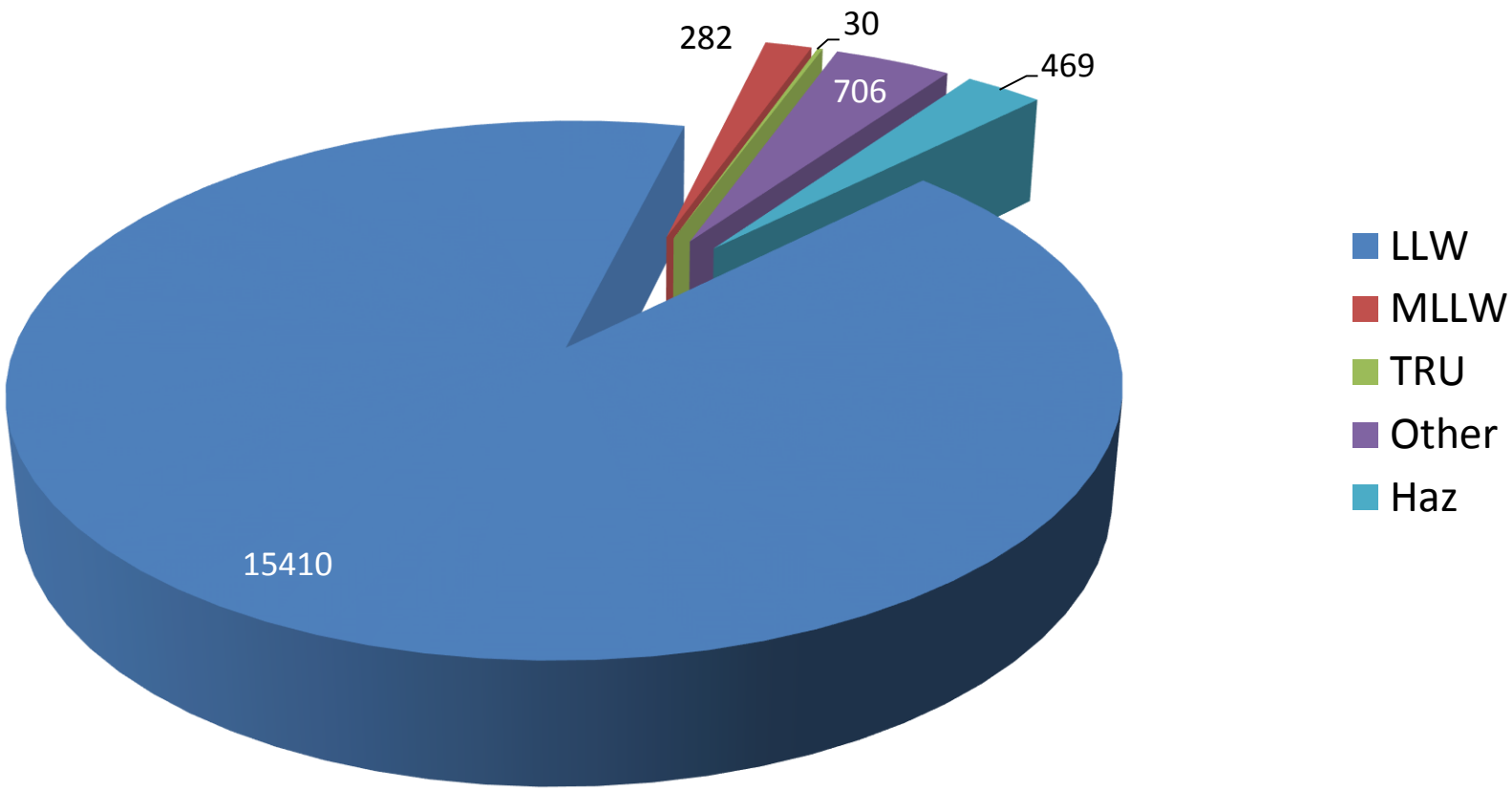
*Actual volumes thru August 23, 2015

DOE LLW/MLLW Forecasts

- EM updates DOE-wide life-cycle LLW/MLLW forecasts annually with input from other Program Offices – National Nuclear Security Administration , Office of Science, Office of Nuclear Energy, and Naval Reactors
- This information publicly available through Waste Information Management System (WIMS) maintained by the Florida International University, http://www.emwims.org/

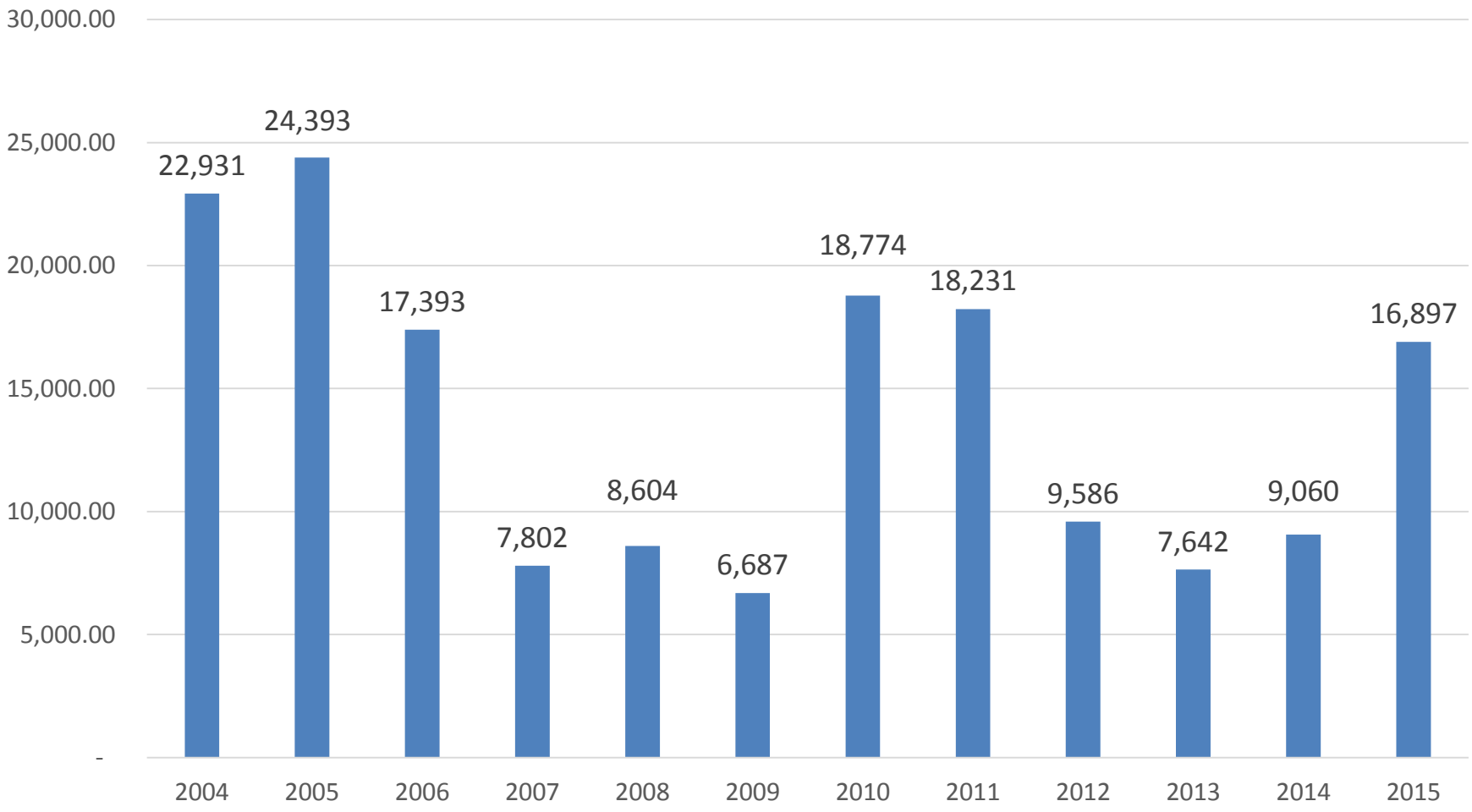
Transportation Data

FY15 EM Shipments

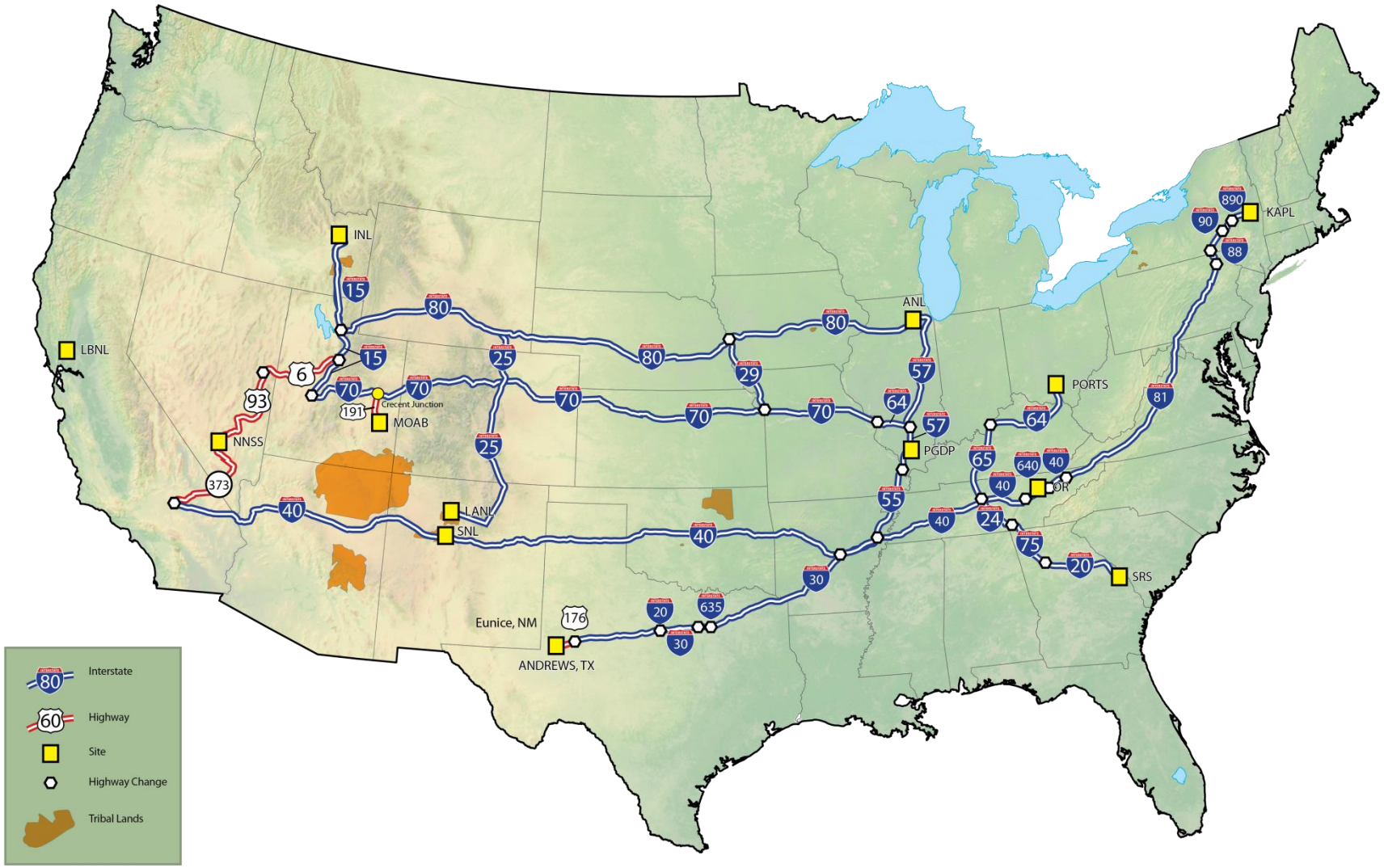


Total number of Shipments = 16,897

Historical EM Shipments



Route Map


INL
LBNL
NNSS
Crecent Junction
MOAB
LANL
SNL
Eunice, NM
ANDREWS, TX
ANL
PGDP
PORTS
KAPL
SRS
Interstate
Highway
Site
Highway Change
Tribal Lands

Observations

- Most LLW/MLLW disposal will continue to be handled on site.
- Small amounts will be transported to NNSS.
- Even smaller amounts will be shipped to the commercial sites.
- By 2015 the amounts of disposal on site will have been reduced to about 3.5 million cubic feet.
- The amount of LLW/MLLW transported offsite to a commercial site or to the NNSS will remain small and about the same as preceding years.

Office of Packaging and Transportation Activities

OPT Programs and Activities

Packaging Certification

- Certificates of Compliance
- DOE Exemptions
- DOT Special Permits
- Quality Assurance
- RAMPAC

Emergency Preparedness & Outreach

- TEPP
- NTSF
- State Regional Groups
- Tribes
- Prospective Shipment Report
- Fact Sheets

Regulations & Standards Support

- Domestic Federal Agencies
- International Community
- Nongovernmental Organizations
- DOE Orders, Policy, Guidance

Transportation Risk Reduction

- Motor Carrier Evaluations
- Physical Protection
- Transportation Compliance Reviews
- Safety Metrics

Program & Site Support

- DOE/Contractor Interfaces
  - TMC
  - PMC
  - EFCOG
- Tender Negotiations
- Automated Systems

Transportation Practices

New DOE Order 460.2B will specifically require compliance with the practices.

- Set of standards for planning and executing offsite shipments of radioactive materials.
- A standardized process and framework for interaction.

DOE organizations are responsible for implementing these practices, as well as applicable agreements with State, Tribal, or local authorities.

Transportation Practices

- Transportation Planning
- Emergency Planning
- Projected Shipment Planning Information
- Routing
- Security

Transportation Practices

- Carrier/Driver Requirements
- Shipment Prenotification
- Transportation Operational Contingencies
- Tracking
- Inspections

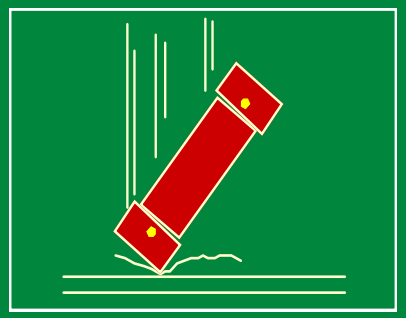
Transportation Practices

- Safe Parking
- Emergency Notification
- Emergency Response
- Recovery and Cleanup

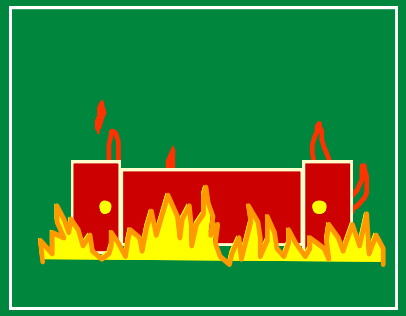
Packaging Review and Approval

- Packaging design
- Issuance of DOE Certificates of Compliance
- Curtail and/or suspend use when warranted
- Quality assurance programs for Type B and fissile radioactive material packaging activities

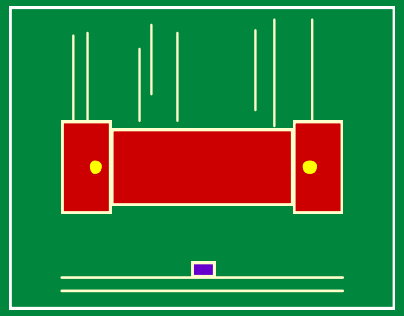
Hypothetical Accident Conditions (HAC) defined in 10 CFR 71.73



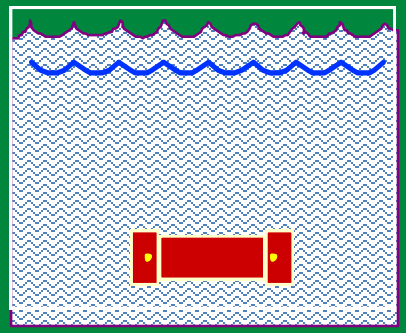
Free Drop - 30 ft on Unyielding Surface



Fire - 1475°F for 30 min



Puncture - 40 in onto a Steel Bar



Water Immersion- 8 hrs

RAMPAC

- Radioactive Material Packaging (RAMPAC)
- Package Certificate Information
- Certificate User Information and Guidance
- Safety Evaluation Reports for DOE-Certified Packages
- Package Safety Regulations, Directives, and Guides
- Training and Education
- Tracking and Monitoring Technology

RAMPAC
Radioactive Material Packaging

EM Office of Environmental Management
safety ❖ performance ❖ cleanup ❖ closure
DOE Packaging and Certification Program

Training and Education

- Packaging University
- Web-based Training
- Meetings and Conferences

College of Engineering
University of Nevada, Reno

Wrap Up

Conclusion

- Disposition of radioactive material and sources ultimately requires safe, secure, and compliant packaging and transport operations
- DOE maintains excellent performance record for safely, securely, and efficiently transporting materials
- DOE continues to support domestic and international safety and security efforts

Closing

- Through partnership with regulators, tribes, stakeholders and industry, we have ability to further clean up mission while mitigating impacts to environment and communities

DOE Contacts

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Backup

Other Future Waste Disposition Planning

- Greater than Class C Low Level Waste
- Evaluation and planning of additional DOE on site disposal facilities at Oak Ridge, Portsmouth and Paducah
- Close continuous monitoring of ongoing regulatory changes by the NRC including the 10 CFR Part 61 LLW Site Specific Analysis Rulemaking