US Dept. of Energy, Environmental Management Program
Waste Disposition Highlights

Presentation for the
Transportation External Coordination Working Group

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EM Environmental Management
safety ❖ performance ❖ cleanup ❖ closure

Introduction

- EM leads DOE's complex-wide efforts to improve disposition planning and optimize waste disposition projects

- DOE's waste management policy remains unchanged and DOE's Programmatic Waste Management Environmental Statement and Records of Decision are still valid

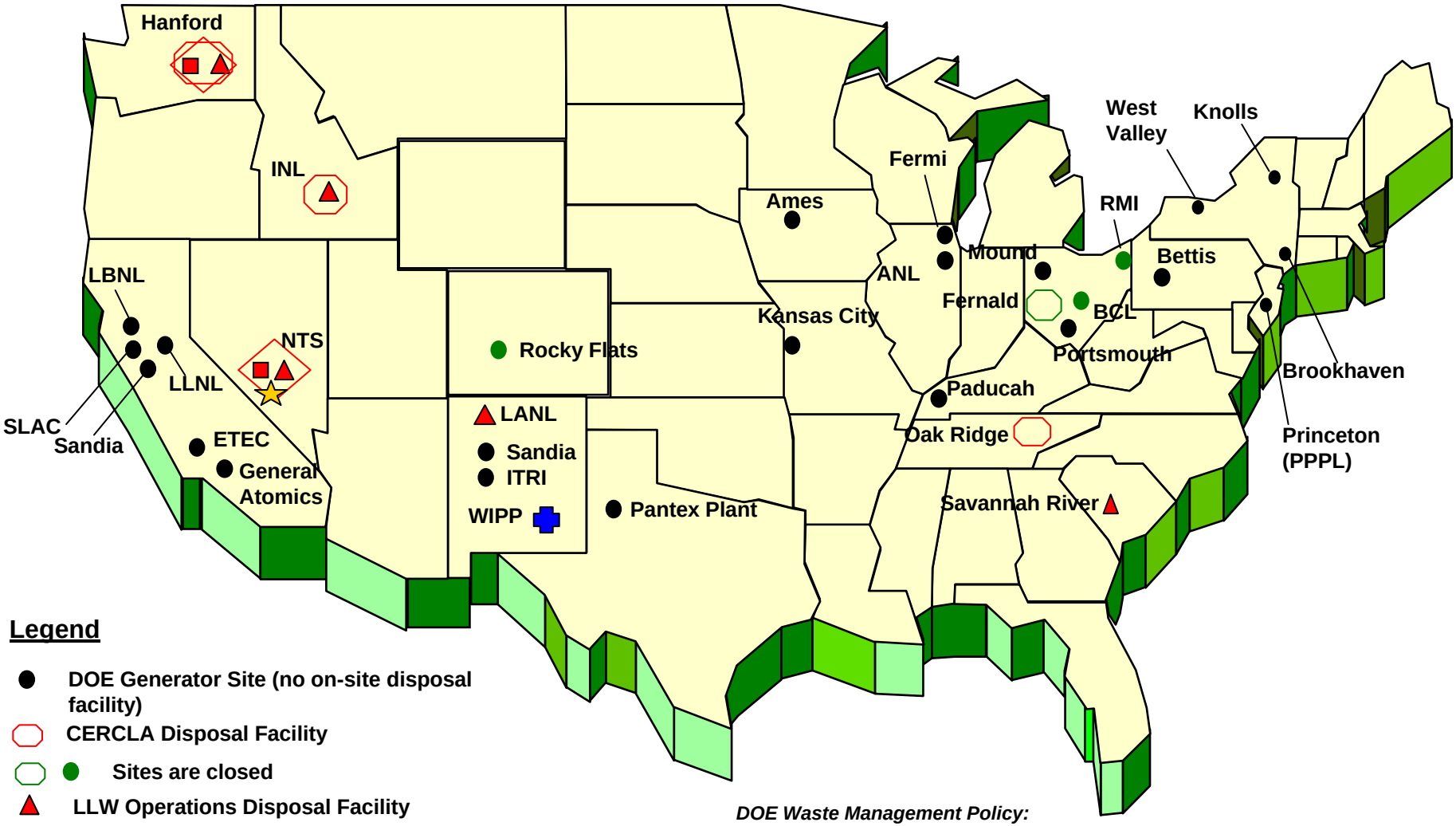
- "National Disposition Strategies" refer to updated plans, tools and management actions needed to strengthen disposition projects and provide greater transparency to DOE sites, communities, stakeholders and regulators

DOE Order 435.1, Radioactive Waste Management, Establishes Policy & Framework for Waste Disposition Activities*

- LLW/MLLW
  - If practical, disposal on the site where generated
  - If on-site disposal not available, at another DOE disposal Facility
  - At commercial disposal facilities if compliant, cost effective, and in the best interest of DOE
- TRU Waste
  - If defense, dispose at Waste Isolation Pilot Plant (WIPP)
  - If defense determination pending, safe storage awaiting future disposition
- HLW and SNF
  - Stabilization, immobilization/treatment if necessary, and safe interim site storage until geologic disposal is available

* Other documents define plan for interim management of special nuclear materials (SNM); excess SNM disposal plans are integrated with waste plans

DOE's Waste Disposal Complex



Legend

- DOE Generator Site (no on-site disposal facility)
- CERCLA Disposal Facility
- Sites are closed
- LLW Operations Disposal Facility
- MLLW Operations Disposal Facility
- Regional LLW Disposal Facility
- Waste Isolation Pilot Plant (WIPP) for TRU disposal
- Yucca Mountain repository for HLW/SNF disposal

DOE Waste Management Policy:

***LLW and MLLW**: If practical, disposal on the site at which it is generated. If on-site disposal not available, at another DOE disposal facility. At commercial disposal facilities if compliant, cost effective, and in best interest of the Department*

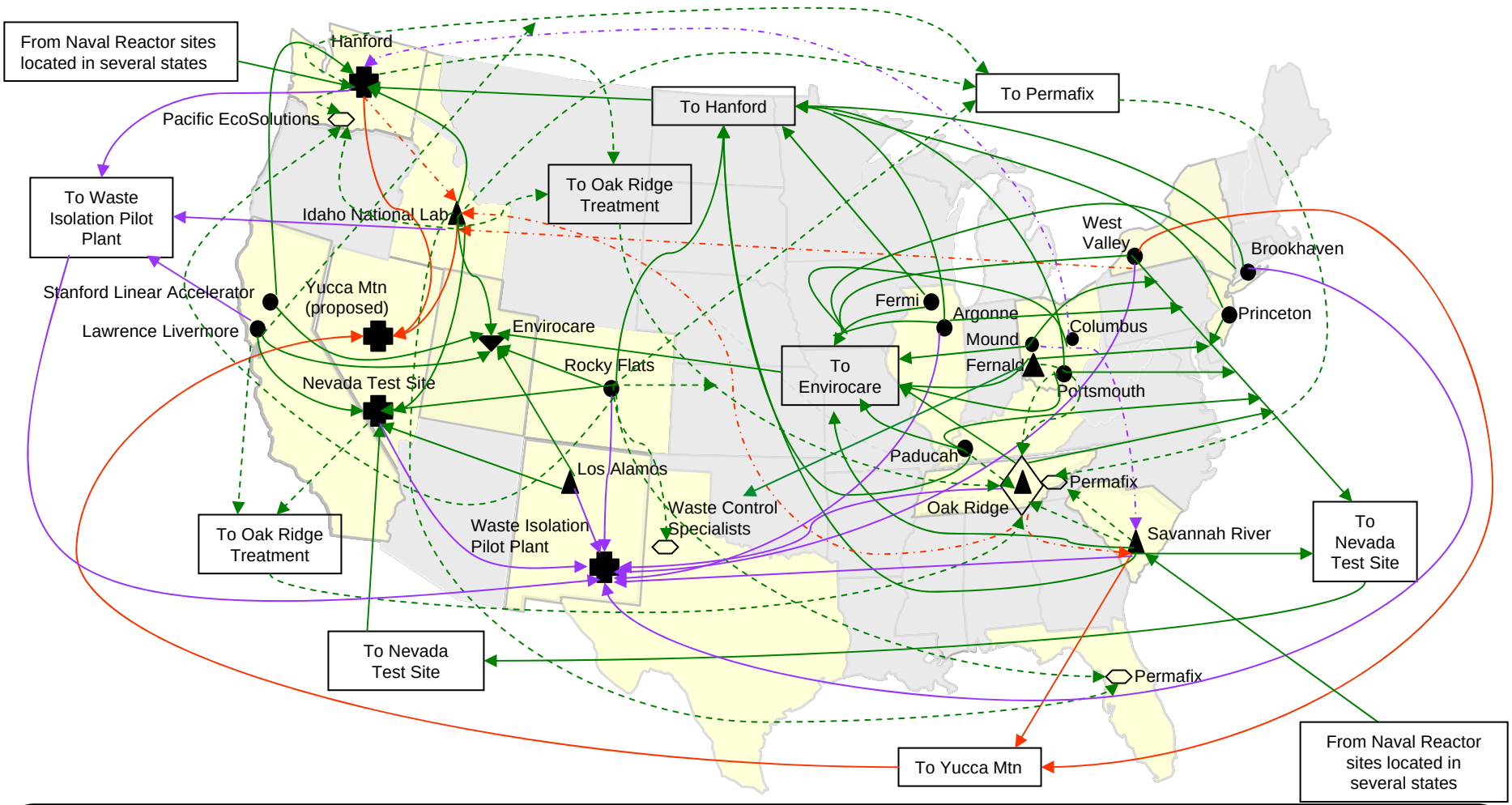
***TRU waste**: If defense, disposed at Waste Isolation Pilot Plant, New Mexico. If non-defense, safe storage awaiting future disposition*

***HLW and SNF**: Stabilization, if necessary, and safe storage until geologic disposal is available*

Major DOE Radioactive Waste Transfers *(includes some commercial facilities)*

BEFORE

Shipment lines do not portray actual transportation routes. This map is not inclusive of all past or planned shipments.



Transuranic Waste Disposal Shipment

Transuranic Waste Processing/Storage Shipment

Spent Nuclear Fuel/High-Level Waste Disposal Shipment

Spent Nuclear Fuel Storage, Treatment, or Repackaging Shipment

Low-Level Waste/Mixed Low-Level Waste Disposal Shipment

Low-Level Waste/Mixed Low-Level Waste Treatment Shipment

DOE Offsite Radioactive Waste Disposal Facility (NTS and Hanford are also generator sites and dispose of some waste onsite)

DOE Onsite Radioactive Waste Disposal Facility

DOE Offsite Radioactive Waste Treatment Facility

Commercial Radioactive Waste Disposal Facility (Note: Envirocare also treats waste)

Commercial Radioactive Waste Treatment Facility

National Disposition Strategies

- Provides framework by which DOE will manage and integrate waste disposition projects
- The National TRU Waste Program has existed for nearly a decade, supported by a Corporate Board
- Comparable integration efforts are underway to optimize the Department's LLW and MLLW disposition efforts

- The National LLW/MLLW Disposition Strategy has been drafted
  - Discusses current DOE and commercial LLW/MLLW treatment and disposal resources and identifies potential bottlenecks
  - Discusses tools and methodologies to strengthen and integrate DOE's LLW/MLLW disposition management
  - Under revision to incorporate comments received on Rev 0 and to incorporate latest data and guidance developments

EM's Disposition Tools

- Comprehensive waste summary for each site
  - Highlights critical activities to achieve final disposition
  - Identifies disposition issues
- Complex-wide disposition issue matrix
  - Top waste and material disposition issues requiring management attention
  - Near-term activities needed to work these issues
- Waste and material disposition tools support EM Integrated Schedule (EMIS)
  - Site disposition activities
  - Federal activities required for disposition

Waste Information Management System (WIMS)

- Updated forecast data on waste shipped offsite and waste disposed (onsite and offsite)
  - Publicly available at **http://wims.arc.fiu.edu/WIMS**
- Contains about 300 waste streams, primarily LLW and MLLW (most DOE program report data)
- EM is using the data for planning activities; e.g., early forecasts of LLW disposal, MLLW treatment requirements, etc.
- Data can inform stakeholders of general LLW/MLLW streams planned for shipment/disposal.
- Revised TRU waste projections will be added later this year

Presentation of Waste Forecast Data in WIMS: Disposition Map for Kansas City Plant

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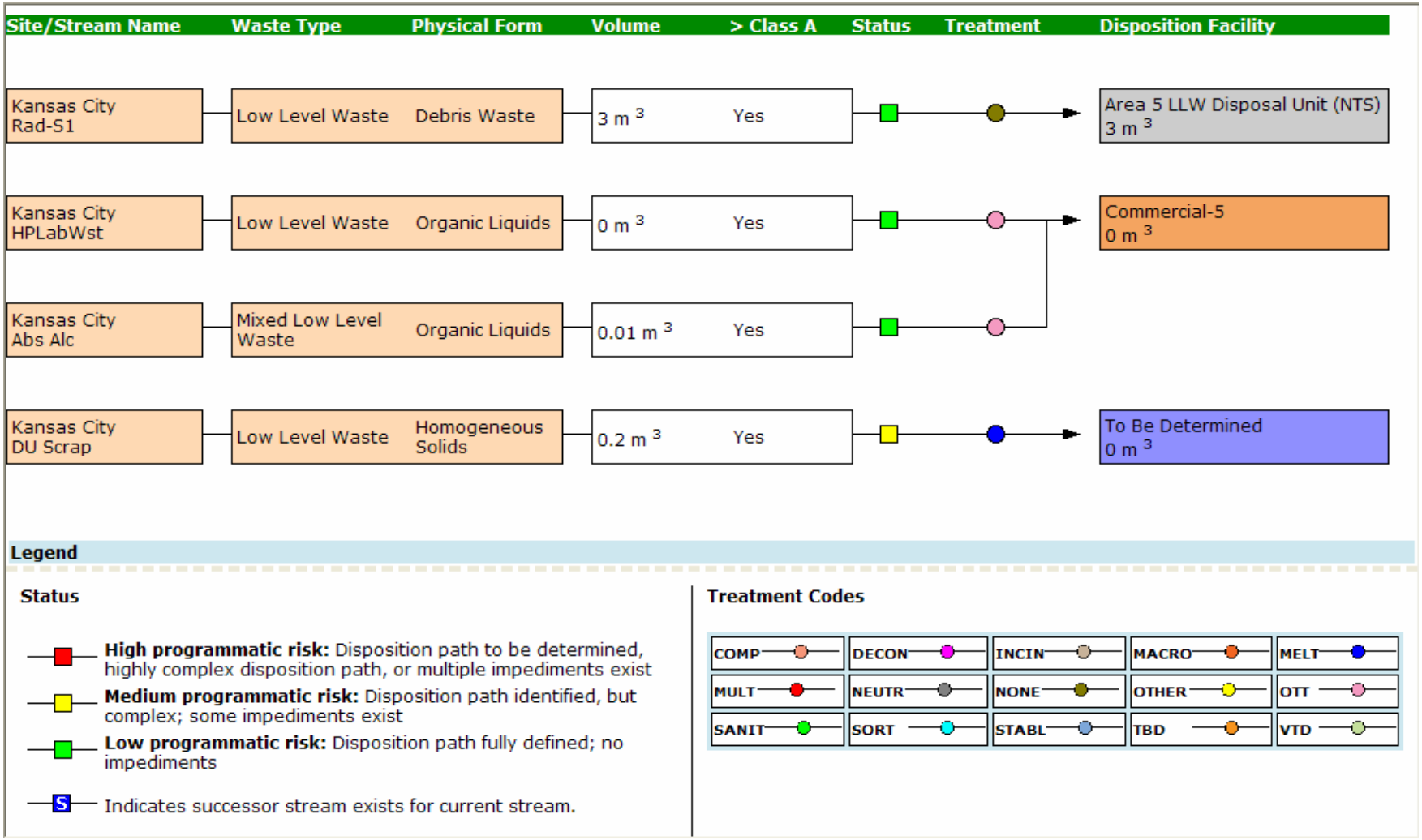

Presentation of Waste Forecast Data in WIMS: Shipments from Idaho National Laboratory

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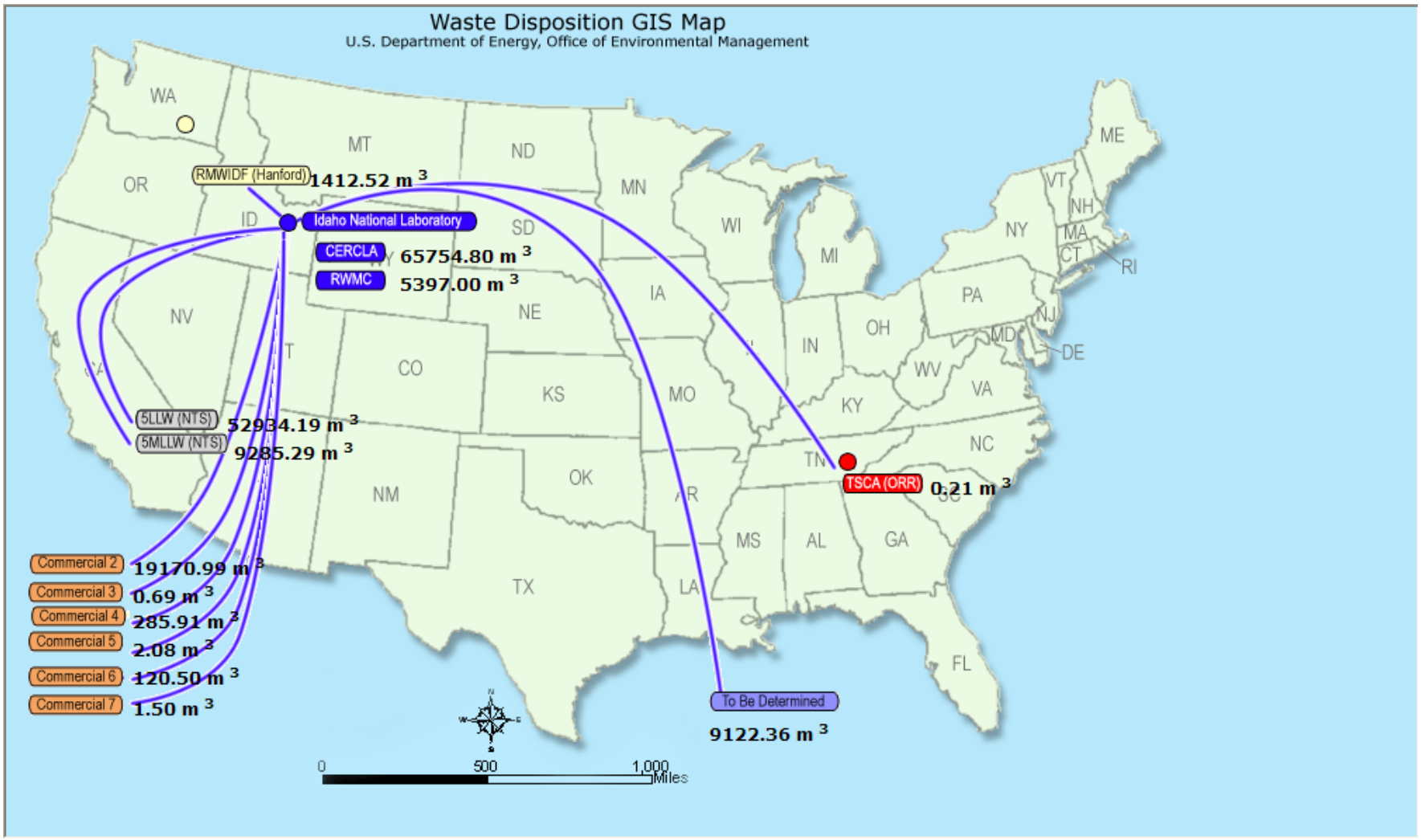

Another WIMS Geographic Disposition Map Example

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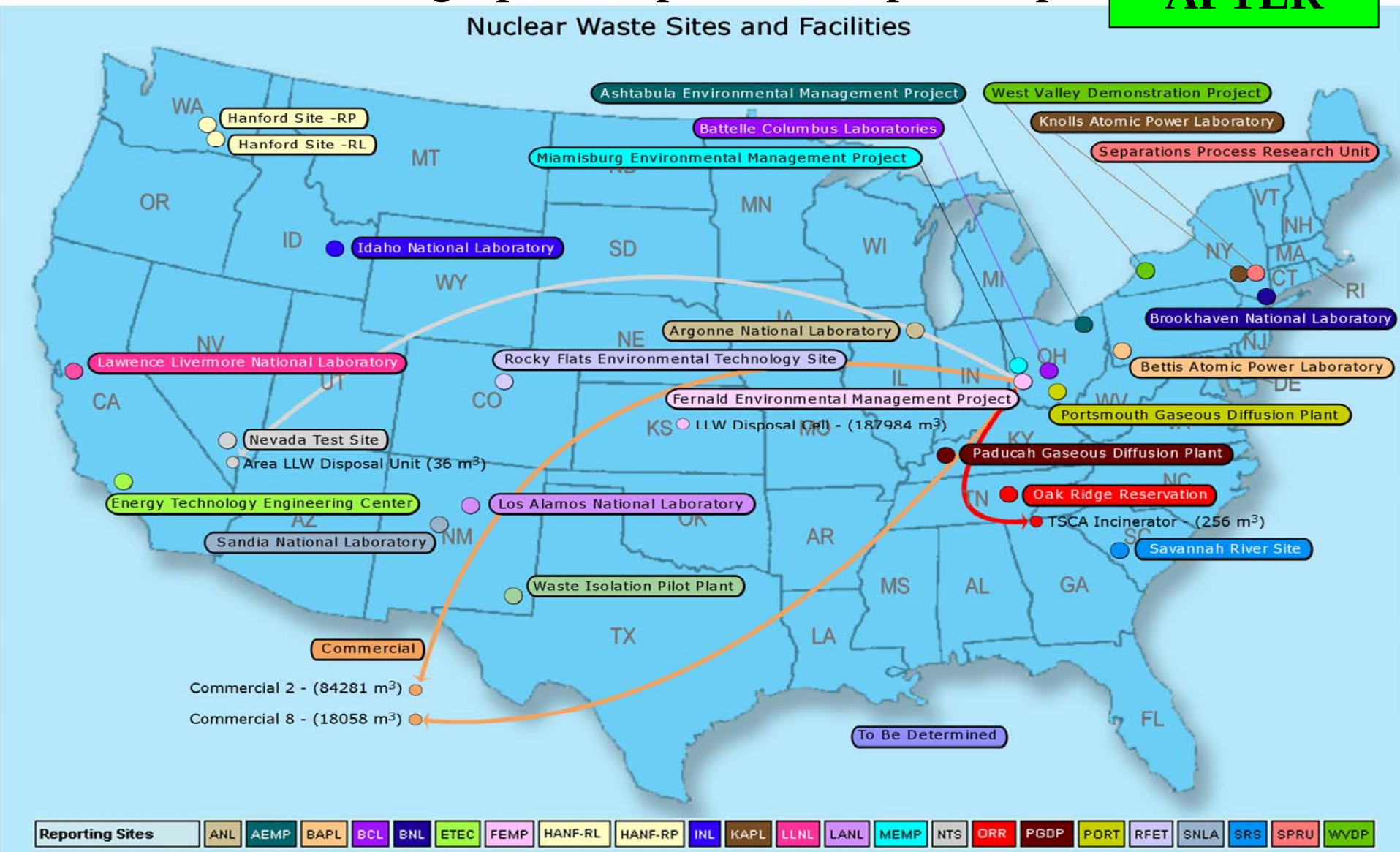
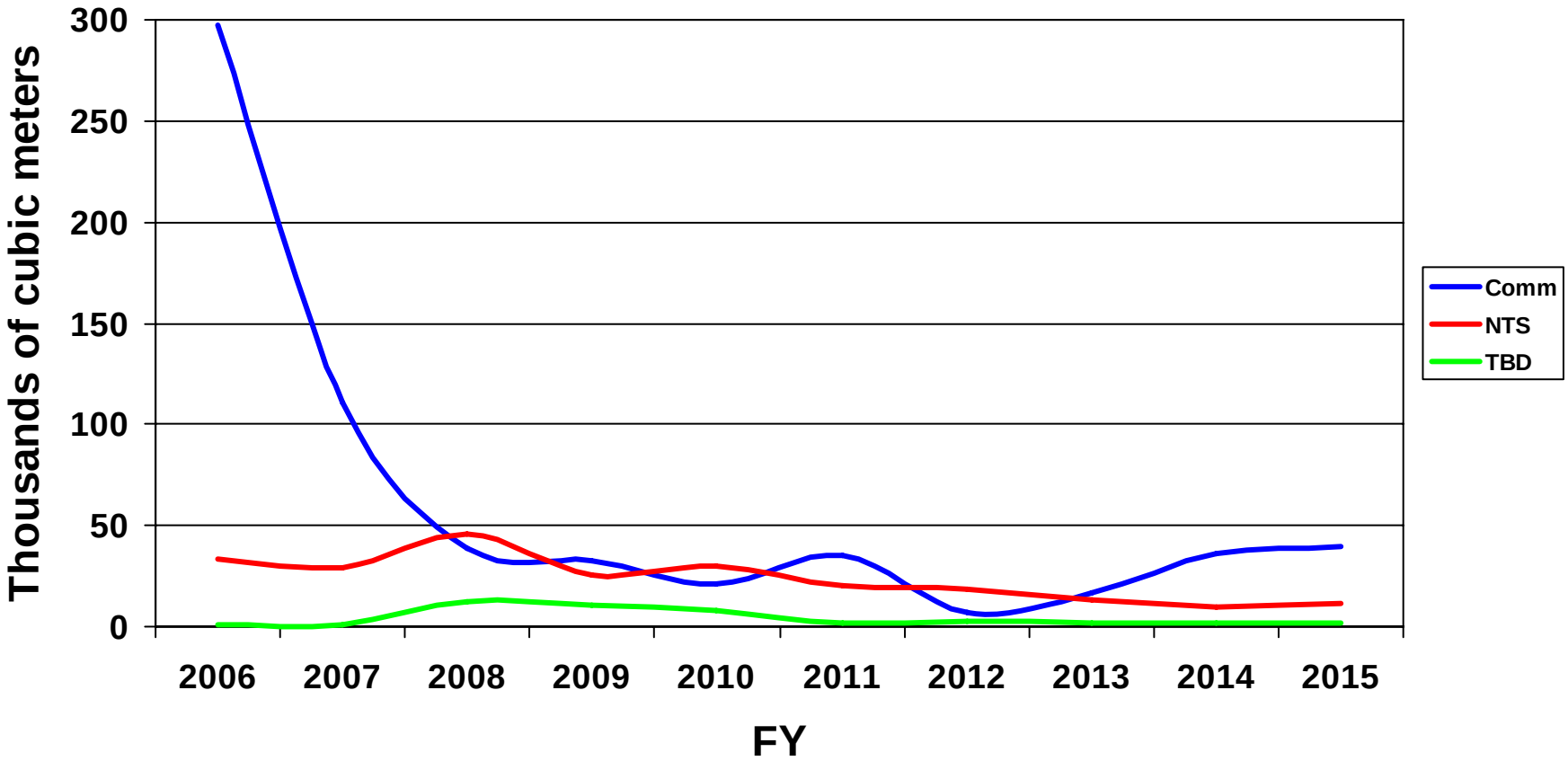


Off Site LLW/MLLW Disposition has Declined



LLW & MLLW Waste Trends

- On-site disposal cells continue to serve large site cleanup programs at Hanford, Idaho, and Oak Ridge
- Projected waste volume to off-site disposal continues downward trend based on latest life-cycle waste updates
  - Closure site completions
  - Budget constraints
  - Project status
- Significant use of commercial waste disposal is expected in spite of smaller volumes
- Large uncertainties remain in out-year forecasts due to currently unplanned/uncertain work scope at several key sites

Specific LLW/MLLW waste disposition challenges

- Development of new, on-site capabilities deterred by budget constraints, reduced volumes, legal and stakeholder issues
- Offsite LLW/MLLW shipments to Hanford remain suspended
- Limited opportunity exists at NTS for higher-activity MLLW disposal
- Limited operations planned at TSCA Incinerator
- Commercial alternatives do not yet exist for some wastes
- "Problematic waste streams" still exist… and future facility D&D will identify more
- Final disposition of Fernald Silo residues remains uncertain

Continued cleanup and future missions absolutely dependent on availability of treatment and disposal

Significant Shipping Campaigns

- West Valley Demonstration Project drum cell cleanout and shipment to NTS
- Mound OU-1 LLW to Clive using Fernald's rail cars.
- Portsmouth converter shells to NTS (classified)
- Increased utilization of the Mixed Waste Disposal Unit at NTS
  - Plans under development for macro-encapsulation of higher activity MLLW from Idaho and Oak Ridge
- Depleted Uranium hexafluoride conversion product (to begin in FY08)
- *Planning also underway for limited SNM and SNF campaigns to support consolidation (FY08 and beyond)*

TRU Waste Disposition Highlights

- Full utilization of WIPP capabilities requires sustained shipping rates
  - 25 contact-handled (CH) shipments/week
  - 6 remote-handled (RH) shipments/week
- Currently, Idaho, Los Alamos, Hanford and Savannah River ship CH TRU
- RH shipments were initiated at Idaho in January, and have ramped up to 3/week to date
- Small quantity RH shipments to follow from other sites (Los Alamos, Savannah River and Argonne)
- CH and RH-TRU shipments from Oak Ridge will begin in FY 2008.
- Some inter-site shipments are under consideration to optimize use processing and characterization capabilities, subject to NEPA

Greater Than Class C (GTCC) Waste

What is GTCC LLW?

- Generated from NRC or Agreement State licensed activities
- Contains radionuclides at concentrations that exceed the limits for Class C radioactive waste in 10 CFR 61.55.
- Includes activated metals from the decommissioning of nuclear reactors, sealed sources, and other miscellaneous resulting from manufacture, research, and industrial activities.
- Must be disposed of in geologic repository unless other methods proposed to and approved by NRC.

The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned DOE the responsibility for developing GTCC disposal capability

Greater Than Class C LLW Disposal EIS

- DOE's Notice of Intent (NOI) approved July 17, 2007; published in *Federal Register* July 23, 2007
  - Initiates the process for developing an environmental impact statement (EIS)
  - Identifies proposed disposal methods/locations for EIS analysis
  - Updates GTCC waste inventories
  - Announces decision to include DOE "GTCC-like" waste
  - Responds to public comments on the Advance Notice of Intent (NOI) (issued May 11, 2005)
  - Requests public comments on EIS scoping issues and announces public scoping meeting dates/locations
  - Public scoping meetings scheduled for August 13, 2007 – September 10, 2007

Projected GTCC Inventories included in NOI

GTCC Waste Inventories

GTCC LLW = 2,600 m^3 @ 110 MCi

- Very little (130 m^3) currently available for disposal
- Activated Metals from nuclear utilities comprise 71% of the total activity (110 MCi) & will not be available for disposal until 2035-2062.

DOE GTCC-Like Waste = 3,000 m^3 @ 31 MCi

- Most is potential non-defense transuranic waste

Waste type	In storage		Projected		Total stored and projected	
	Volume in cubic meters (m3)	Activity in millions of curies (MCi)	Volume (m3)	Activity MCi	Volume (m3)	Activity MCi
GTCC LLW						
Activated metal	58	3.5	810	110	870	110
Sealed sources	(a)	(a)	1,700	2.4	1,700	2.4
Other waste	76	0.0076	1.0	0.00023	77	0.0078
Total GTCC LLW	130	3.5	2,500	110	2,600	110
DOE GTCC-Like Waste						
Activated metal	5.0	0.11	29	0.82	34	0.93
Sealed sources	8.7	0.013	25	0.030	34	0.043
Other	860	11	2,000	19	2,900	30
Total DOE GTCC-like waste	870	11	2,100	20	3,000	31
Total GTCC and GTCC-like waste	1,000	15	4,600	130	5,600	140

(a) NRC licensees currently possess sealed sources that may become GTCC LLW when no longer needed by the licensee; the estimated volume and activity of those sources are included in the projected inventory

GTCC Disposal Alternatives Proposed in NOI

Location	Method
WIPP	Geologic Disposal
Proposed Yucca Mountain Repository	Geologic Disposal
Hanford Site	Enhanced Near Surface (ENS) Intermediate Depth Borehole (IDB)
Idaho National Laboratory	Enhanced Near Surface (ENS) Intermediate Depth Borehole (IDB)
Los Alamos National Laboratory	ENS IDB
Nevada Test Site	ENS IDB
Oak Ridge Reservation	ENS IDB
Savannah River Site	ENS IDB
WIPP Vicinity	ENS IDB
Generic Commercial	ENS IDB

Combinations of alternatives will be considered based on the different waste types

Greater Than Class C Waste/EIS Schedule

- Advance NOI – May 11, 2005
- NOI – July 17, 2007
- Draft EIS – 2008
- Final EIS – ~2009
- Report to Congress on the disposal alternatives considered – ~2009 (after EIS is completed)
- Record of Decision and implementation – TBD (following Congressional action on disposal alternatives report)