



EM Corporate Transuranic (TRU) Strategy

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Summary of Topics

- Introduction
- Improving Waste Disposition
- FY 2024 Budget request
- Waste Classifications and Regulatory Responsibility
- Waste Management Requirements
- Operating Disposal Facilities
- Disposal Options Analysis
- TRU/WIPP Updates
- Waste Management Oversight
- Idaho Engagement with National TRU Program
- Conclusion



Improving Waste Disposition

Disposal of radioactive waste is a core function of the EM program. Without waste disposal capabilities, **cleanup cannot proceed**. EM uses a combination of DOE and commercial disposal facilities, which are vital to the EM cleanup mission. EM's safety culture and well-established statutory and regulatory regime ensure waste is disposed in a manner that protects the public, workers, and the environment and is in accordance with the applicable requirements.

<https://www.energy.gov/em/articles/em-strategic-vision>

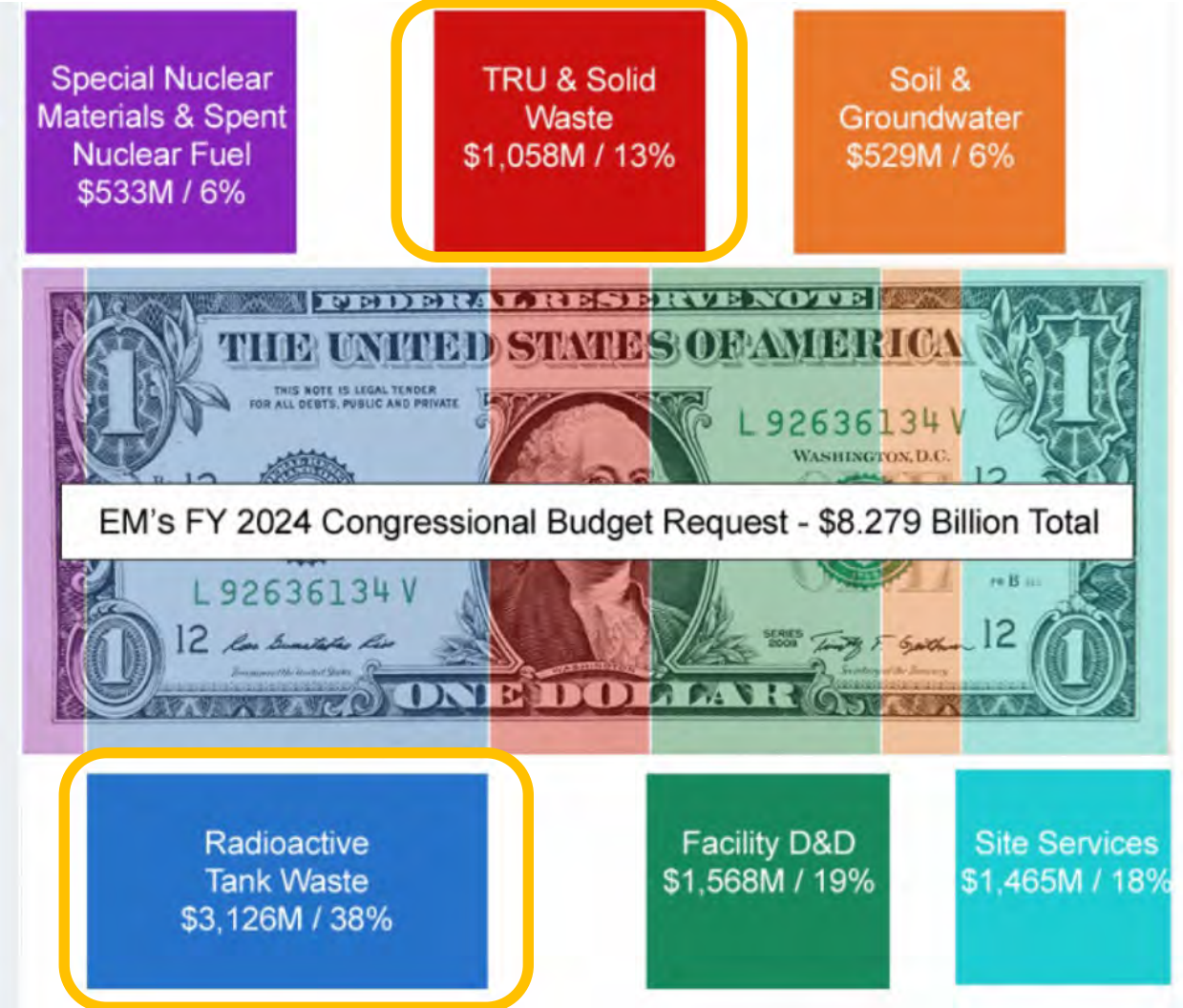


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FY24 Budget Request



“Waste”
portion > 50%



Radioactive Waste Classifications, Regulatory, and Disposal Paths

Waste Classification and Definition	Regulatory Responsibilities	Disposition Path
High Level Waste (HLW): (A) highly radioactive waste material resulting from the reprocessing of spent nuclear fuel (SNF), including liquid waste produced directly in reprocessing and any solid materials derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the DOE determines requires permanent isolation.	<ul style="list-style-type: none"> DOE for disposal US Environmental Protection Agency (EPA) disposal standards US Nuclear Regulatory Commission (NRC) licensing 	Geologic repository
Transuranic (TRU): Waste containing more than 100 nanocuries (nCi/g) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years.	<ul style="list-style-type: none"> DOE for disposal EPA certification New Mexico permit 	Waste Isolation Pilot Plant (WIPP), defense TRU waste only
Low Level Waste (LLW): Radioactive waste that is <i>NOT</i> : HLW, SNF, TRU waste, byproduct material or naturally occurring radioactive material (NORM). Mixed LLW: Radioactive waste with a hazardous component regulated under the Resource, Conservation and Recovery Act.	<ul style="list-style-type: none"> DOE for disposal of DOE owned LLW NRC Agreement State for commercial facilities EPA/State permit if mixed 	DOE or commercial near-surface disposal facilities
Greater-than-Class C (GTCC) LLW	<ul style="list-style-type: none"> NRC regulates disposal 	Geologic repository unless proposals for disposal in a disposal site licensed pursuant to 10 CFR 61 are approved by NRC; NRC currently looking at near-surface disposal Environmental Impact Statement is complete by DOE



Waste Management Requirements

➤ Atomic Energy Act of 1954 (AEA):

- Authorizes DOE to regulate possession, use and safe disposal of radioactive materials. This authority is implemented through the DOE directives system (e.g., DOE Order 435.1, *Radioactive Waste Management*).

➤ Resource Conservation and Recovery Act (RCRA) Permits:

- Gives EPA/States the authority to control hazardous waste from the "cradle-to-grave," e.g., generation, transportation, treatment, storage, and disposal of hazardous waste.

➤ Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):

- Provides broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

➤ Some Additional Agreements:

- 1995 Idaho Settlement Agreement;
- Nevada Division of Environmental Protection (NDEP) participation in the Nevada National Security Site Waste Acceptance Review Panel;
- Federal Facilities Agreements (Tri-party between DOE, EPA and State) at Hanford, Savannah River Site, and Idaho National Laboratory, etc.



Operating DOE & Commercial Disposal Facilities Currently Used by DOE

Hanford Site

- Onsite LLW/MLLW and Naval Reactors LLW
- Integrated Disposal Facility awaiting commissioning (onsite vitrified low-activity waste and LLW)

- All waste is disposed in accordance with each waste disposal facility's WAC.
- Each waste disposal site is licensed to dispose of specific waste types (see map below for examples).



★ DOE Disposal Facility ■ Commercial Disposal Facility
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act; RCRA – Resource Conservation and Recovery Act



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Disposal Options Analysis

- EM decides the waste disposal pathway, which is safe, compliant, and in the best interest of the government and taxpayers.
- The current policy for disposal decisions is found in DOE Manual 435.1-1. First, we consider onsite disposal, if suitable; if not, offsite disposal at another DOE site; and finally at compliant and licensed commercial facilities.
- Decisions consider waste characteristics, range of compliant disposal pathways, transportation, packaging, cost, schedule, and other factors.
- If applicable, decisions are consistent with CERCLA/RCRA cleanup agreements with specific remedies, and state regulators are formal parties to these processes.
- For defense generated Transuranic (TRU) waste, the Waste Isolation Pilot Plant is the disposal pathway



WIPP Team



U.S. Department of Energy Carlsbad Field Office

- Leads the Transuranic Waste Program
- Science Program



Salado Isolation Mining Contractors LLC

- Manages and operates the WIPP facility
- Manages transportation logistics and packages
- Manages waste retrieval, characterization and certification
- Mobile loading



Los Alamos National Laboratory

- Scientific advisor for waste characterization



Aleut Aerospace Engineering, LLC— TRANSCOM

- Satellite Tracking



Sandia National Laboratories

- Scientific advisor for repository recertification



CBFO Technical Assistance Contractor

- Technical and Quality Assurance support for the Carlsbad Field Office



Specialty Transportation, Inc.

CAST Specialty Transportation

- Transportation carrier



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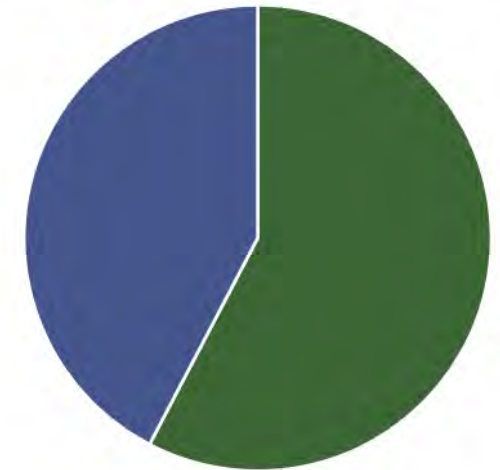
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TRU Waste and WIPP Updates

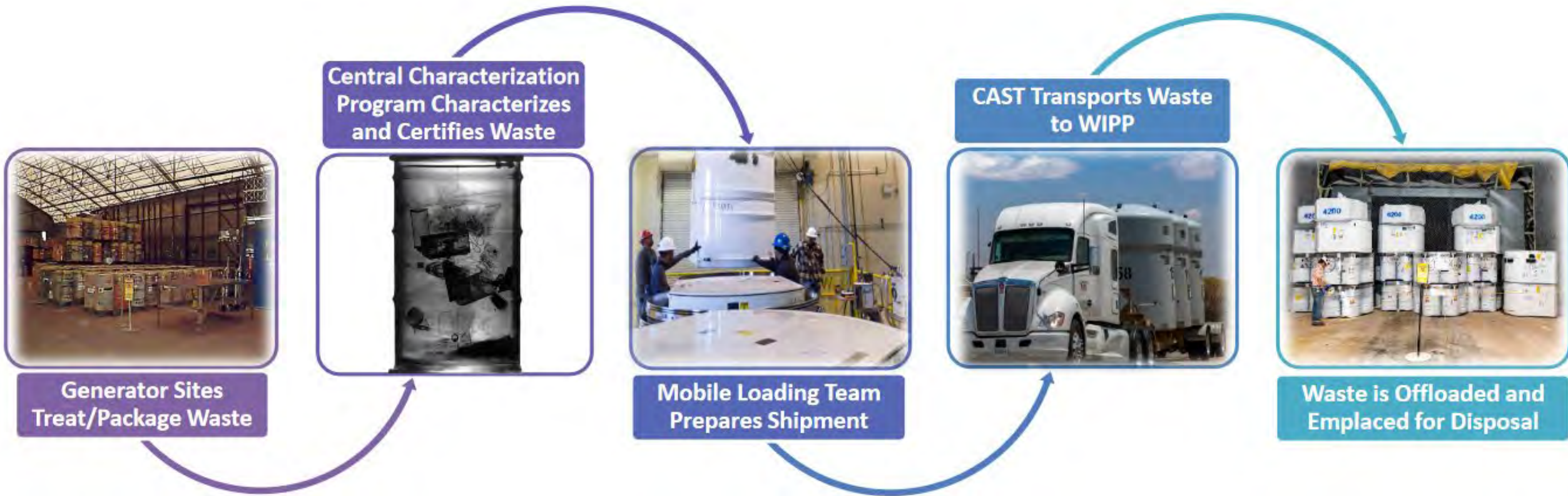
- Waste Isolation Pilot Plant (WIPP) has been disposing of defense transuranic waste since 1999.
- New 10-yr New Mexico Hazardous Permit became effective November 3, 2023.
- As of February 5, 2024
 - 13,843 total shipments.
 - 75,848.54m³ disposed.
- In FY23, 473 shipments
- In FY 24, 164 shipments
- DOE expects having capacity to dispose of all TRU waste within the WIPP Land Withdrawal Act volume capacity limit (6.2 million ft³ ~ 0.17 million m³)
- The WIPP TRU waste inventory estimates are updated on an annual basis (Annual Transuranic Waste Inventory Report 2022, DOE/TRU-22-3425 Rev.0).



WIPP LWA Capacity (Cubic Feet)



General Process



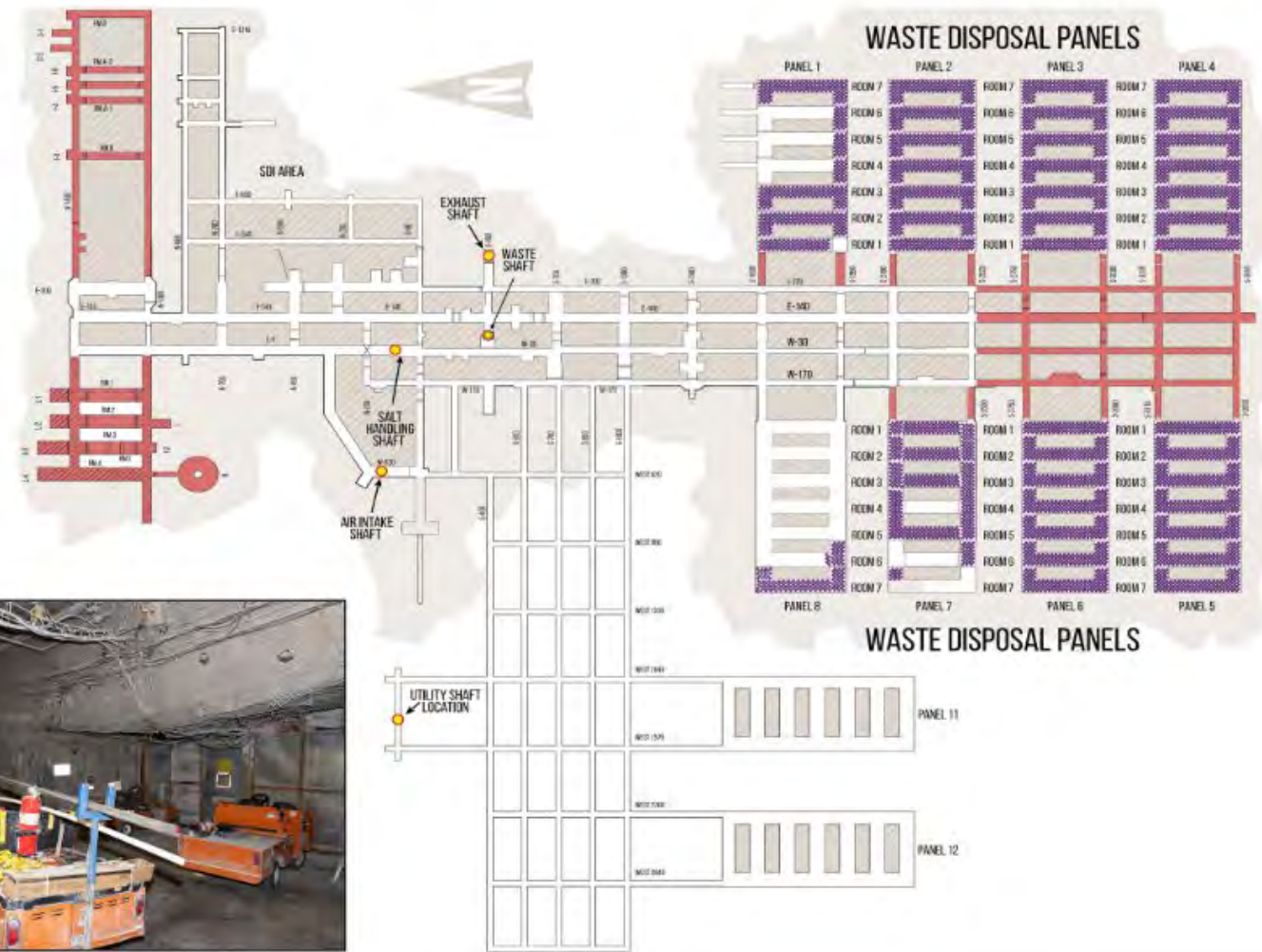
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Underground Status

- Mining done on just-in-time basis due to salt creep
- Currently mining access drifts to the west
- Drifts will tie into the Utility Shaft and replacement panels 11 and 12
- Preparing to equip west mains with infrastructure
- Mine Safety and Health Administration Inspections



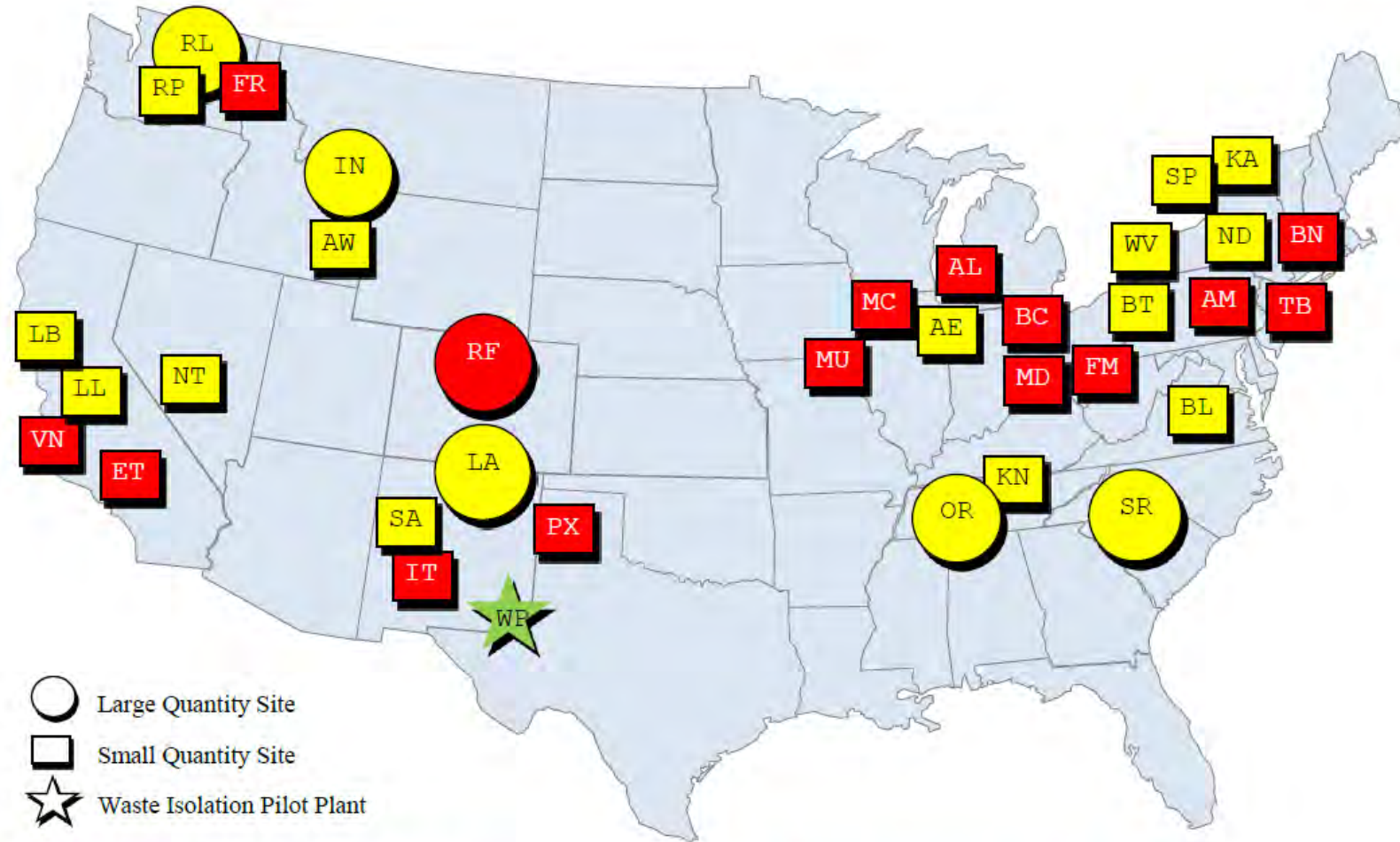
Infrastructure Investments

- Projects will:
 - Reduce maintenance down time
 - Improve operational efficiencies
 - Increase annual shipping rate
- Safety Significant Confinement Ventilation System (SSCVS)
- Utility Shaft (US)
- General Plan Project (GPP)



TRU Generator Sites

(from Annual Transuranic Waste Inventory Report 2022)



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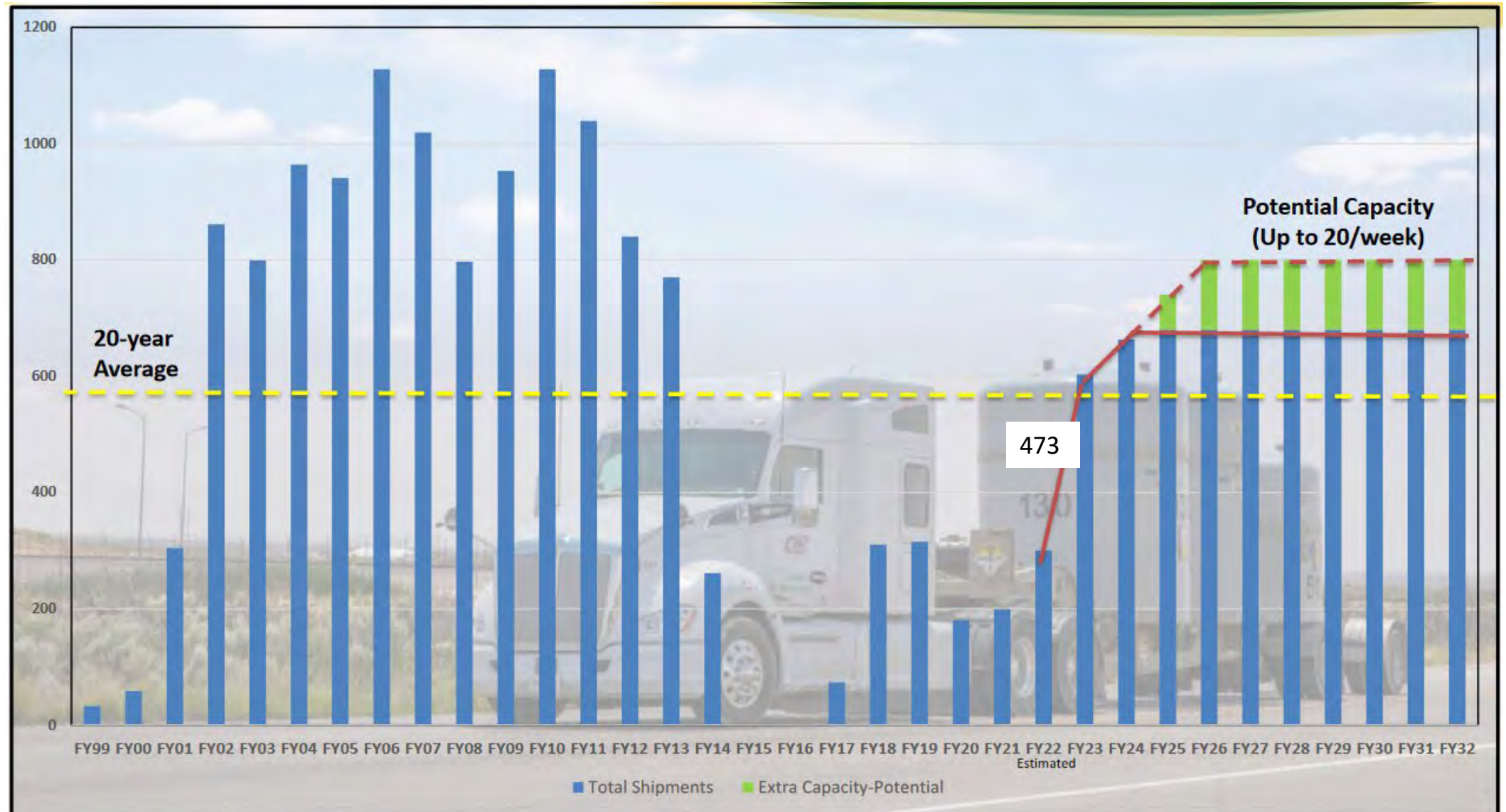
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Various Federal Agency and State Waste Management Oversight

- **Regulatory**
 - Hazardous components: States and EPA (RCRA & CERCLA); Department of Transportation.
 - NRC and Agreement States for commercial disposal facilities.
- **DOE Site/Field Office**
 - Assess contractor performance.
 - Approves
 - Radioactive Waste Management Basis (systematic approach for planning, executing, and evaluating the management of radioactive waste; ensures that waste management activities are compliant)
 - Special Analyses
- **DOE HQ Program Offices**
 - Assess DOE Site/Field Office performance and oversight functions.
 - DOE Order 435.1 periodic reviews.
- **DOE HQ Independent Oversight**
 - Office of Environmental Health, Safety, and Security.
 - Office of Enterprise Assessment.
 - Low-Level Waste Disposal Facility Federal Review Group; Disposal Authorization Statement for on-site disposal facilities (i.e., permit).
- **External Independent Oversight**
 - Defense Nuclear Safety Board (DNFSB), Government Accountability Office, DOE Inspector General, etc.



Current/Projected Shipments



WIPP 10-yr Shipping Analyses

National TRU Program

- Desired Outcomes
 - Our WIPP/Your WIPP
 - Long term health of the WIPP
- Important Considerations
 - National TRU Program risks as a whole
 - Regulator/State requirements – consent orders
 - Commodities for shipping
 - Waste certification and availability
 - Maintain infrastructure
- Assumptions
 - Plan will be reviewed regularly for updates – living document
 - Target number of shipments/week for 40 shippable weeks

Idaho Cleanup Project TRU Program

- Desired Outcomes
 - Consistent shipments
 - Projected completion of shipping
 - Long term health of the workforce, public, and environment
- Important Considerations
 - Meet the Idaho Settlement Agreement and Site Treatment Plan requirements
 - Commodities are available and affordable for shipping
 - Idaho Cleanup Project waste certification program remains intact
 - Maintain infrastructure at Idaho site
- Assumptions
 - Plan will be reviewed regularly for updates – living document
 - Target maximum shipments/week for 40 shippable weeks



Result - Safe and Efficient Shipping

National & Idaho TRU Programs

- Outcomes
 - Our WIPP/Your WIPP
 - Long term health of the WIPP and infrastructure
 - Consistent shipments
- Incorporated Considerations
 - National TRU Program risks as a whole
 - Regulator/State regulatory requirements
 - Commodity reliability and alternatives for shipping
 - Waste certification programs and available waste
 - Maintain infrastructure at Idaho and at the WIPP
- Ongoing Assumptions
 - Plan will be reviewed regularly (annually) for updates – living document
 - Target 17 shipments/week for 40 shippable weeks to the DOE complex
 - Idaho scheduled for 55% of shipments
 - Targeted completion of Idaho Shipments in 2032



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Safe Transportation (routes)



BACK UP SLIDES



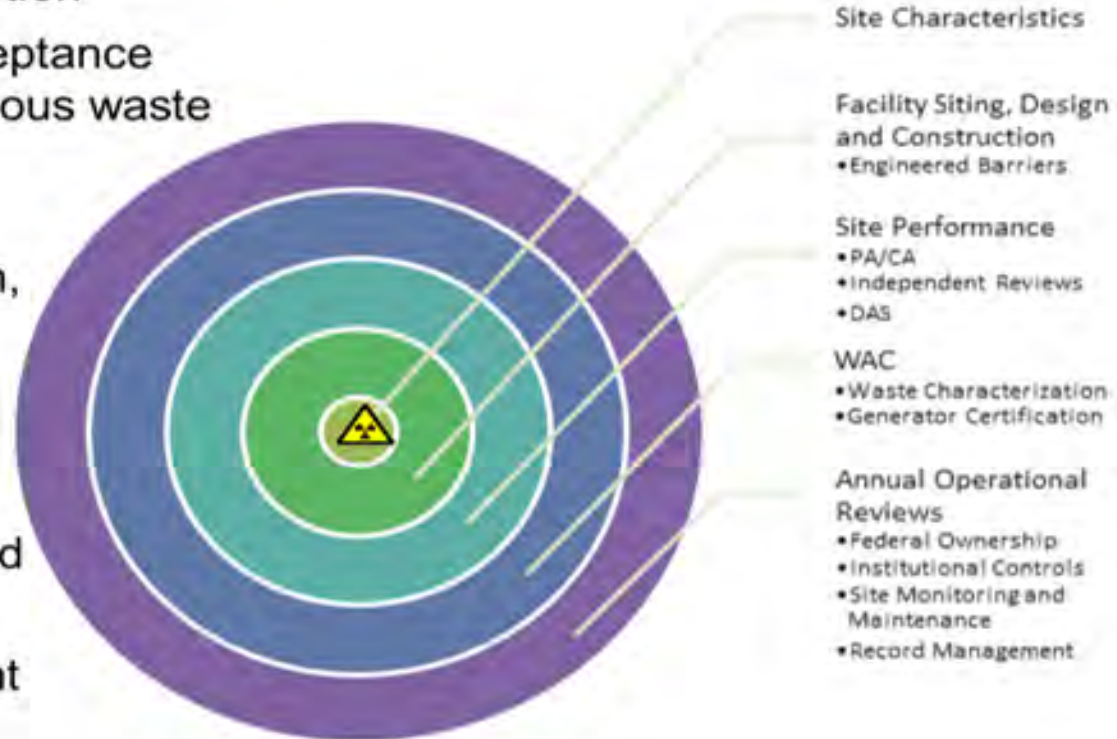
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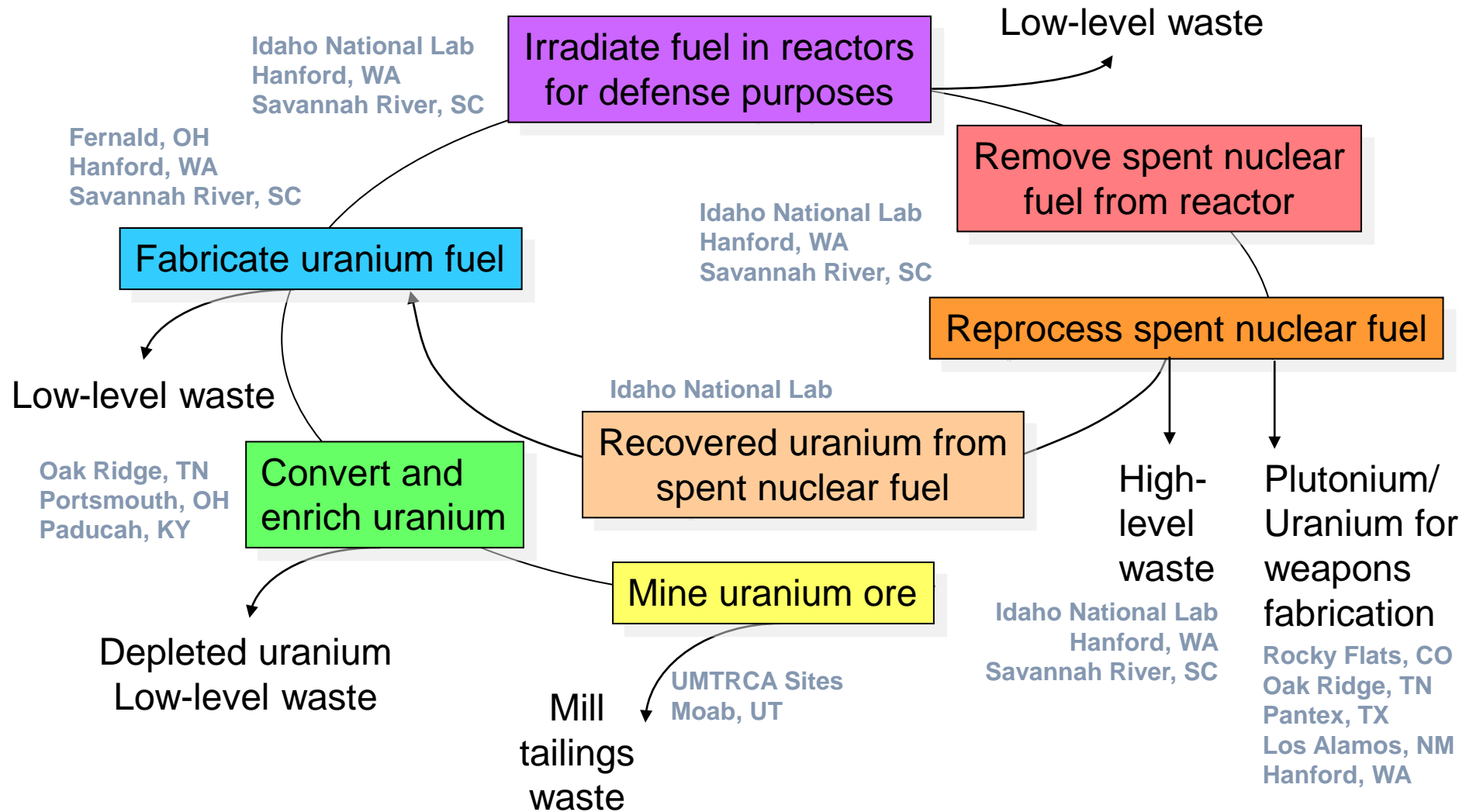
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Disposal Facility Defense In Depth

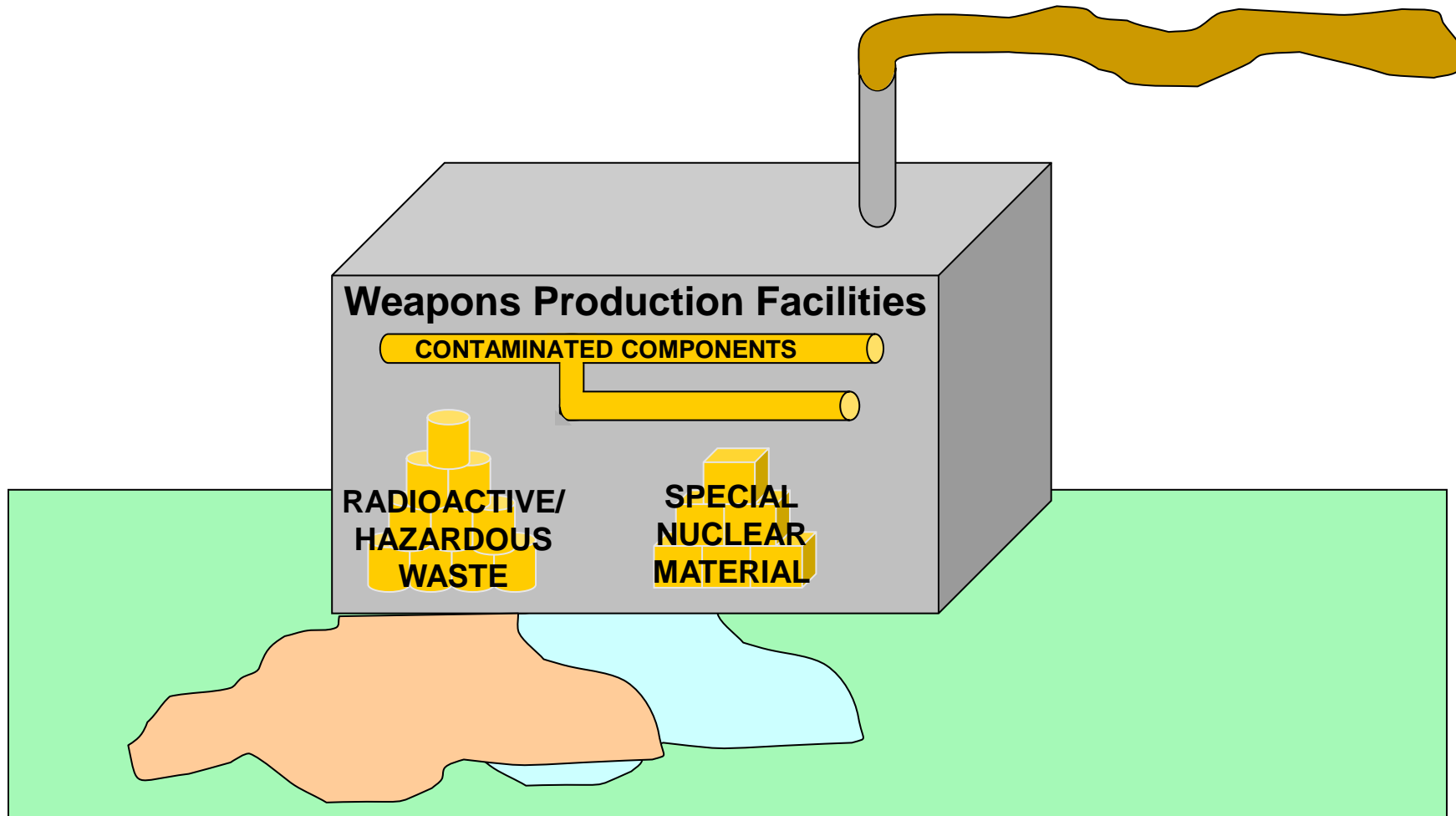
- Multiple layers of protection
- Site-specific waste acceptance criteria (WAC) and rigorous waste generator certification
- WAC can also be specific to facility design, container and waste forms
- Federal ownership and necessary buffer zones until site can be released
- Commitment to continuous improvement with PA reviews and maintenance, including monitoring



Legacy Radioactive Waste Resulted from the Department's Defense Mission

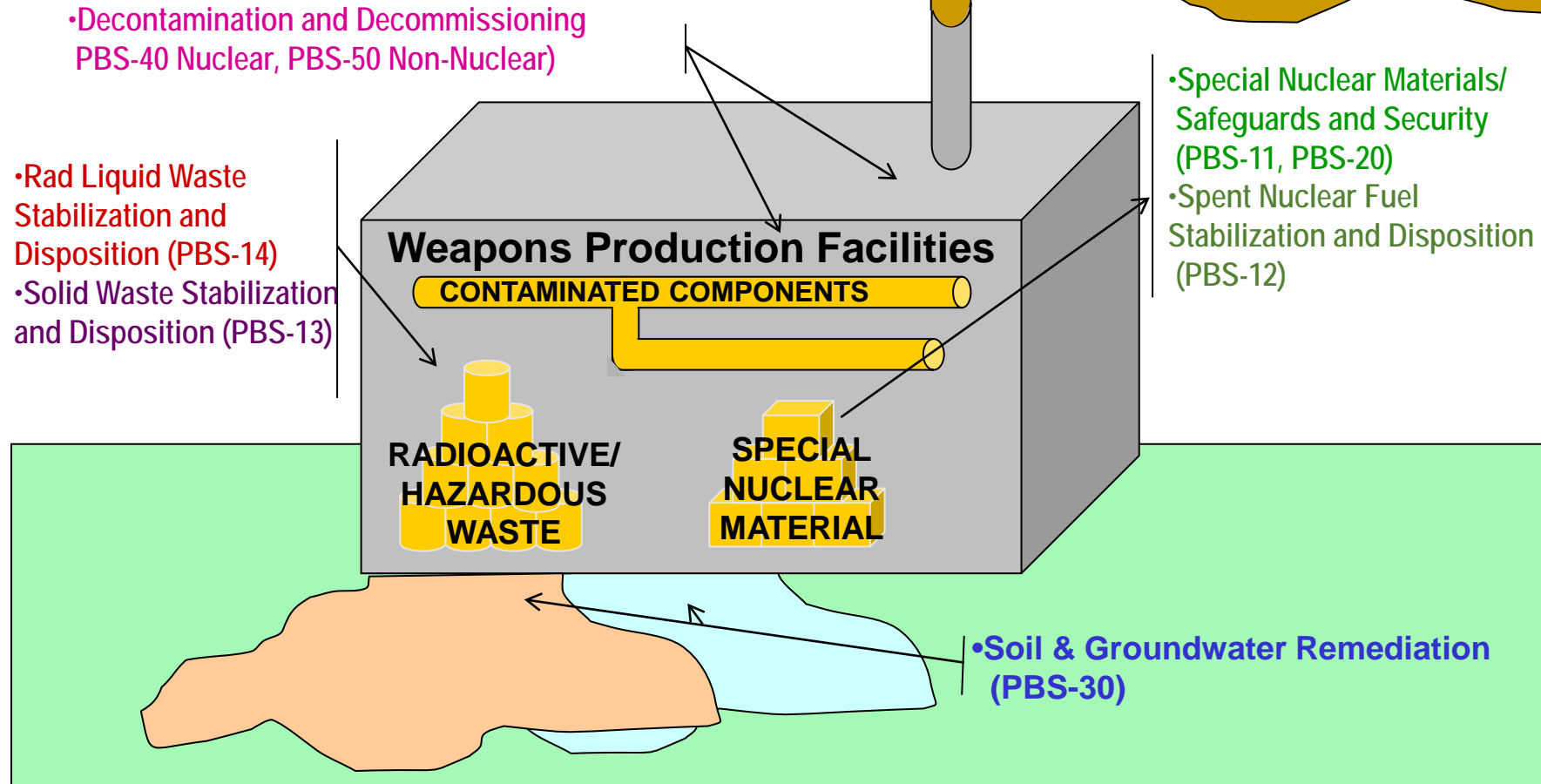


Pictorial Representation of EM Workscope



EM Workscope aligns with Budget and Project Framework

(PBS = Project Baseline Summary)

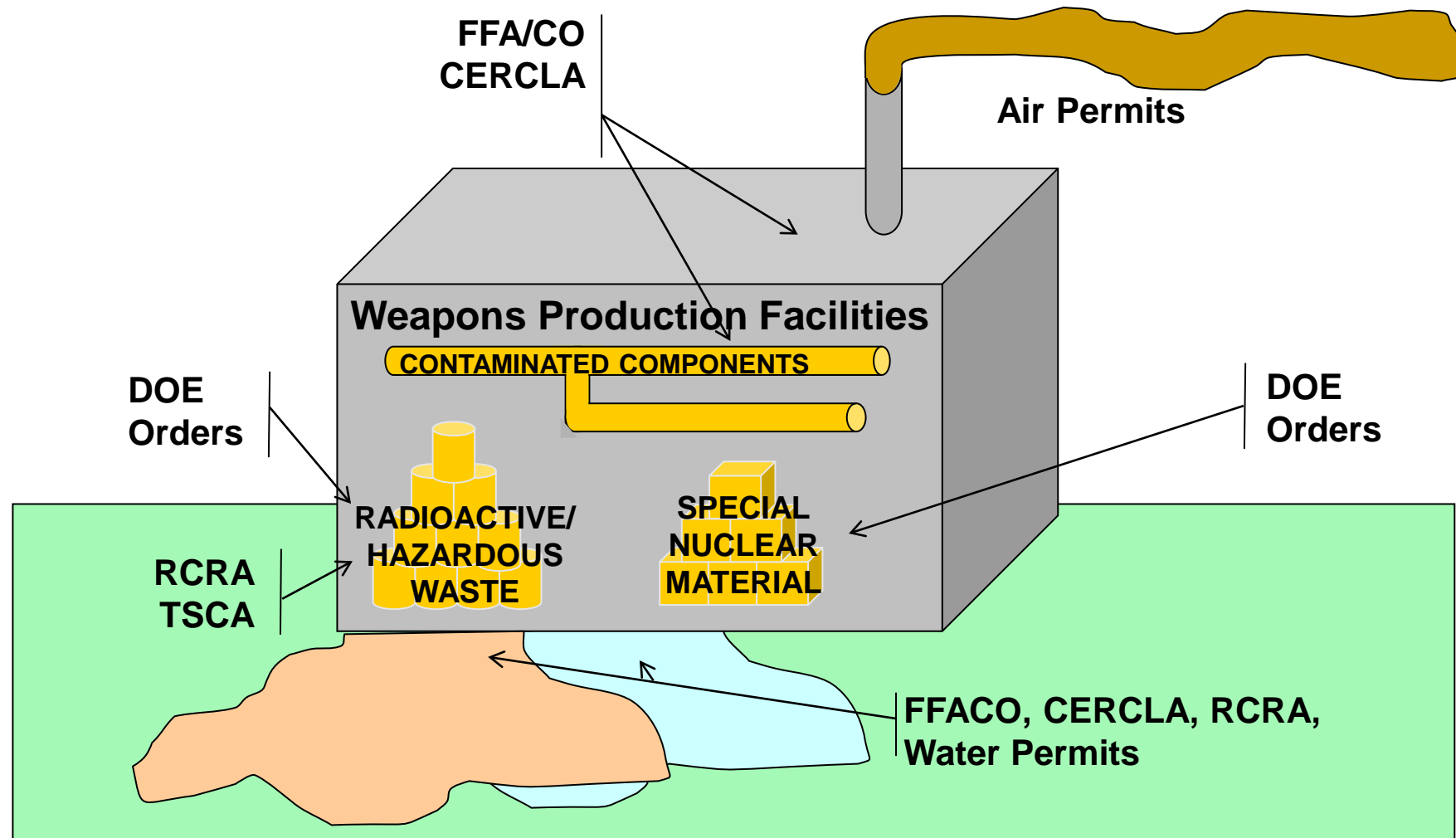


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EM Workscope with Regulatory/Compliance Drivers



Waste Information Management System (WIMS)



WIMS is developed to provide DOE Headquarters and site waste managers with the tools necessary to easily visualize, understand, and manage the vast volumes, categories, and problems of forecasted waste streams.



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