



# **Regulating the Nuclear Industry Decommissioning and Waste Management in 2015 and Beyond**

**September 2, 2015**

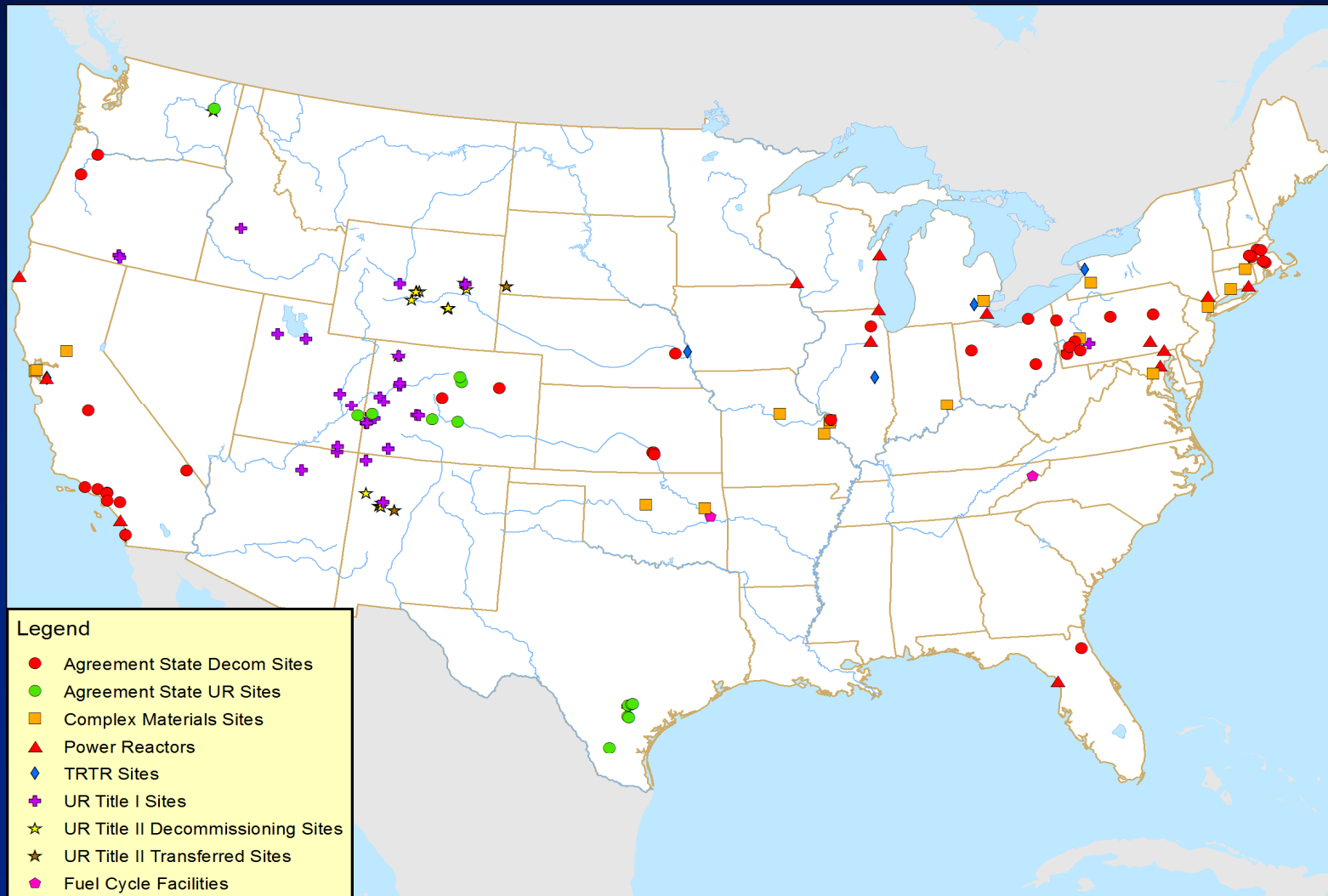
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Office of Nuclear Materials Safety and Safeguards**

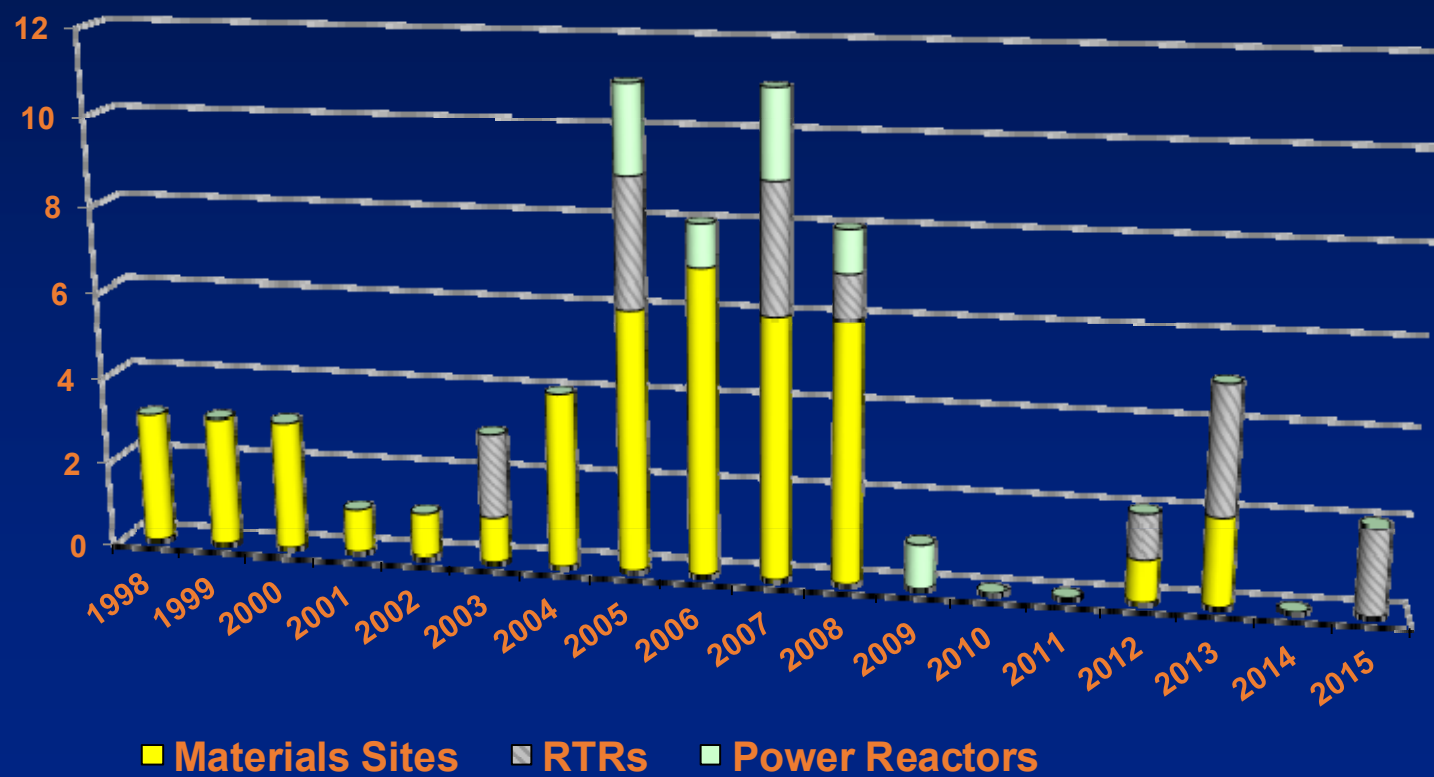
# Decommissioning Overview

- **Materials, Power Reactors and Non-power reactors**
- **Manage complex decommissioning activities, including licensing and inspections**
- **Develop decommissioning rule**

# U.S. Decommissioning Universe



# Decommissioning Completions





## Materials/Uranium Recovery Facilities

### ***Before Cleanup***

Licensee ceases operations and notifies NRC.  
Licensee submits decommissioning plan (DP) or reclamation plan (RP) to NRC for review.  
NRC performs technical and environmental reviews of licensee plan and documents the reviews in NRC safety and environmental reports.  
NRC approves DP/RP if acceptable.

### ***During Cleanup***

Licensee conducts cleanup activities, as described in the DP/RP.  
NRC conducts periodic inspections.  
Licensee completes cleanup activities.

### ***After Cleanup***

Licensee conducts final status survey and submits report.  
NRC conducts confirmatory surveys and reviews licensee's report.  
NRC approves final status survey report and terminates license.

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*Uranium Recovery Sites: Custodial agency submits Long Term Surveillance Plan (LTSP) for NRC review. Upon NRC's acceptance of LTSP, the existing license is terminated and the title to the site is transferred to the custodian under general license.*

## Power Reactor Facilities

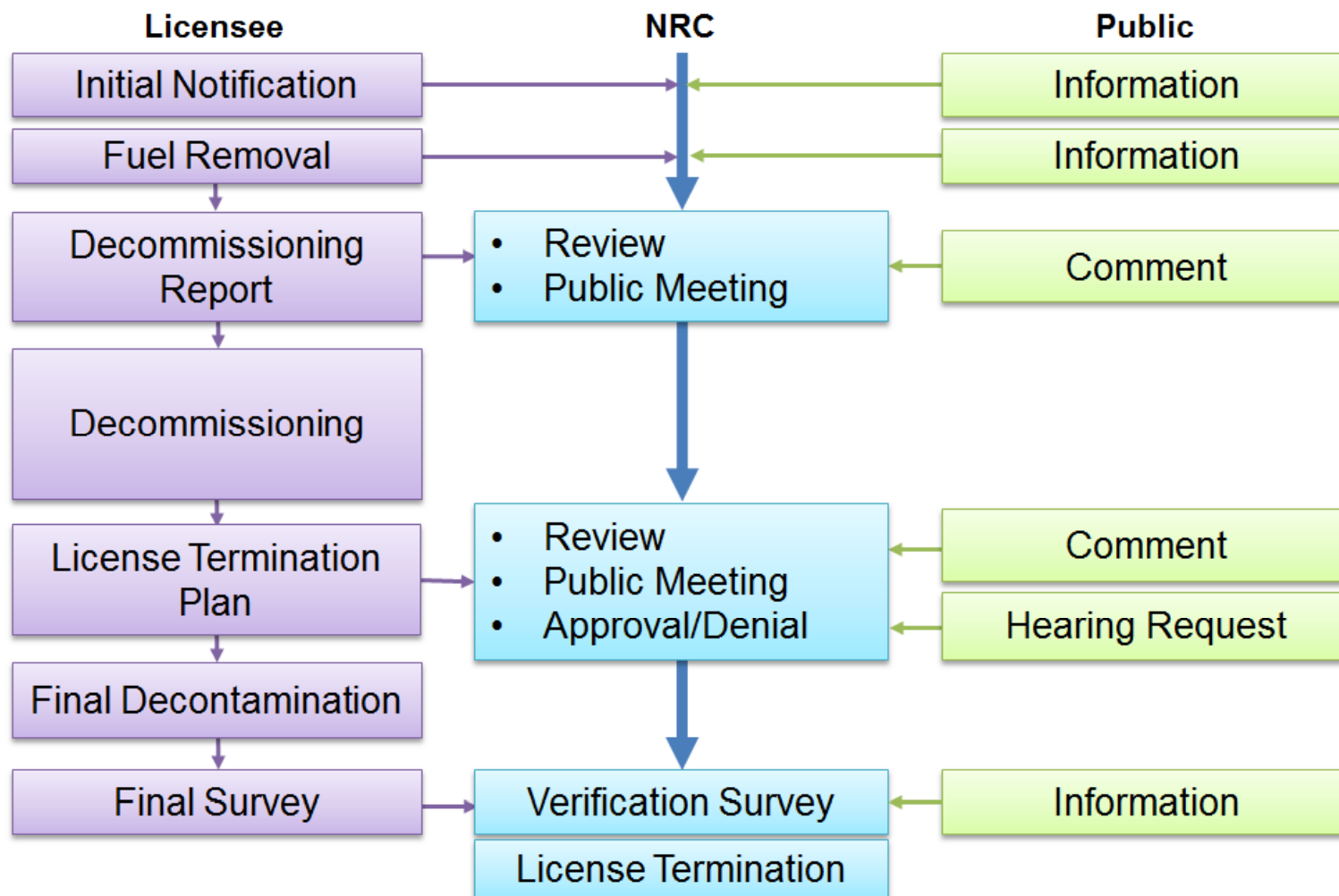
### ***Before Cleanup***

Licensee ceases operations and notifies NRC.  
Licensee submits post-shutdown decommissioning activities report (PSDAR) for NRC's information.  
Licensee waits 90 days before starting any major decommissioning activities.

### ***During Cleanup***

Licensee initiates cleanup activities, as described in the PSDAR.  
Licensee submits license termination plan (LTP) for review 2 years before license termination. The plan outlines remaining decommissioning activities.  
NRC performs technical and environmental reviews of the licensee plan and documents the reviews in NRC safety and environmental reports. NRC approves LTP if it is acceptable.  
NRC conducts periodic inspections.  
Licensee completes cleanup activities.

## Reactor Decommissioning Process



## Current Status of Power Reactors in Decommissioning

### In SAFSTOR

- Dresden 1
- Fermi 1
- La Crosse
- Indian Point 1
- Millstone 1
- Peach Bottom 1
- San Onofre 1
- NS Savannah
- GE Vallecitos
- GE VESR
- Three Mile Island
- Kewaunee

### Active DECON

- Humboldt Bay 3
- Zion 1 & 2
- SONGS 2 & 3

### Reactors Transitioning

- Crystal River 3
- Vermont Yankee

# Power Reactors Recent Regulatory Activities

- **Humboldt Bay**
- **Zion 1 & 2**
- **SONGS 2 & 3**
- **Crystal River 3**
- **Vermont Yankee**

# Power Reactors Rulemaking

- Commission directed rulemaking
- Update, enhance, and complete the decommissioning rulemaking activities suspended in 2002

Milestones	Estimated Completion Date
Issue Advance Notice of Proposed Rulemaking (ANPR)	September 2015
Provide Detailed Schedule, Estimated Resources, and Impacts to Commission	September 2015

# Research and Test Reactors Decommissioning

- **R&TRs sites undergoing decommissioning**

Name	Location
General Atomics - TRIGA Mark F	San Diego, CA
General Atomics - TRIGA Mark I	San Diego, CA
General Electric Co. - GETR	Sunol, CA
State University of New York at Buffalo	Buffalo, NY
Veterans Administration	Omaha, NE

- **University of Michigan and Worcester Polytechnic Institute decommissioned in 2015**

# Materials Sites

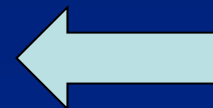
Site Name	Location	State
AAR Manufacturing, Inc.	Livonia	MI
Alameda Naval Air Station	Alameda	CA
Beltsville Agricultural Research Laboratory	Beltsville	MD
Cimarron (Kerr-McGee)	Cimarron	OK
FMRI (Fansteel), Inc.	Muskogee	OK
Hunter's Point Naval Shipyard	San Francisco	CA
Jefferson Proving Ground	Madison	IN
Mallinckrodt Chemical, Inc.	St. Louis	MO
McClellan (former Air Force base)	Sacramento	CA
Shallow Land Disposal Area	Vandergrift	PA
Sigma-Aldrich	Maryland Heights	MO
Stepan Chemical Company	Maywood	NJ
UNC Naval Products	New Haven	CT
West Valley Demonstration Project	West Valley	NY
Westinghouse Electric (Hematite Facility)	Festus	MO





# Hematite

Before



During



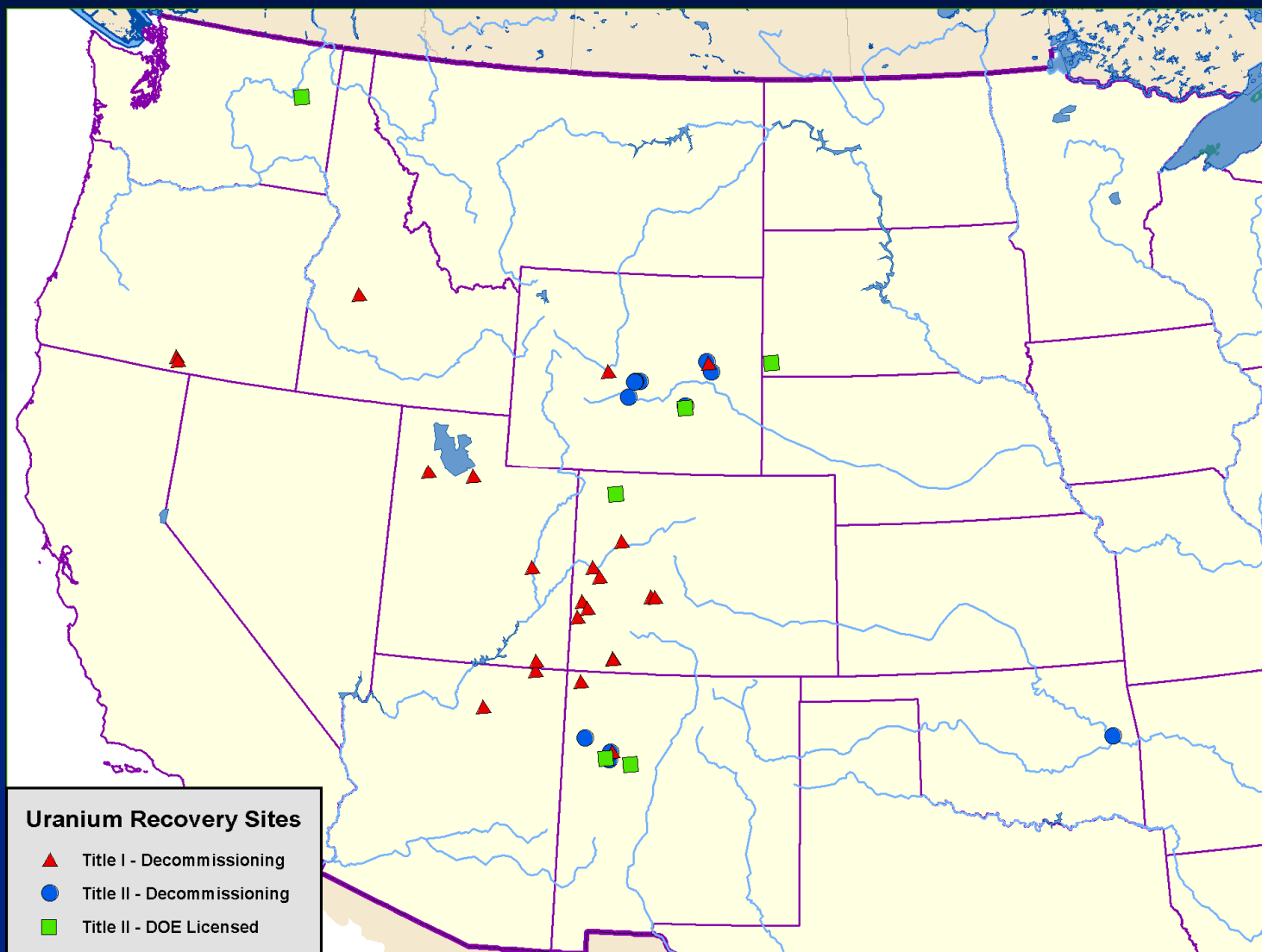
# Radium

- **Military**
  - Hunters Point
  - Alameda Naval Air Station
  - McClellan Air Force Base
- **Non-military**
  - Great Kills Park
  - Waterbury Clock Factory

## **Project Challenges – Materials and Research Reactor sites**

- **Legacy Sites**
  - complex sites that are difficult to decommission for a variety of financial, technical, or programmatic reasons
- **Ensuring Adequate Financial Assurance for Decommissioning/Bankruptcy**
- **Ensuring Timely Decommissioning**

# Decommissioning Uranium Recovery Sites



# Durango – Title I



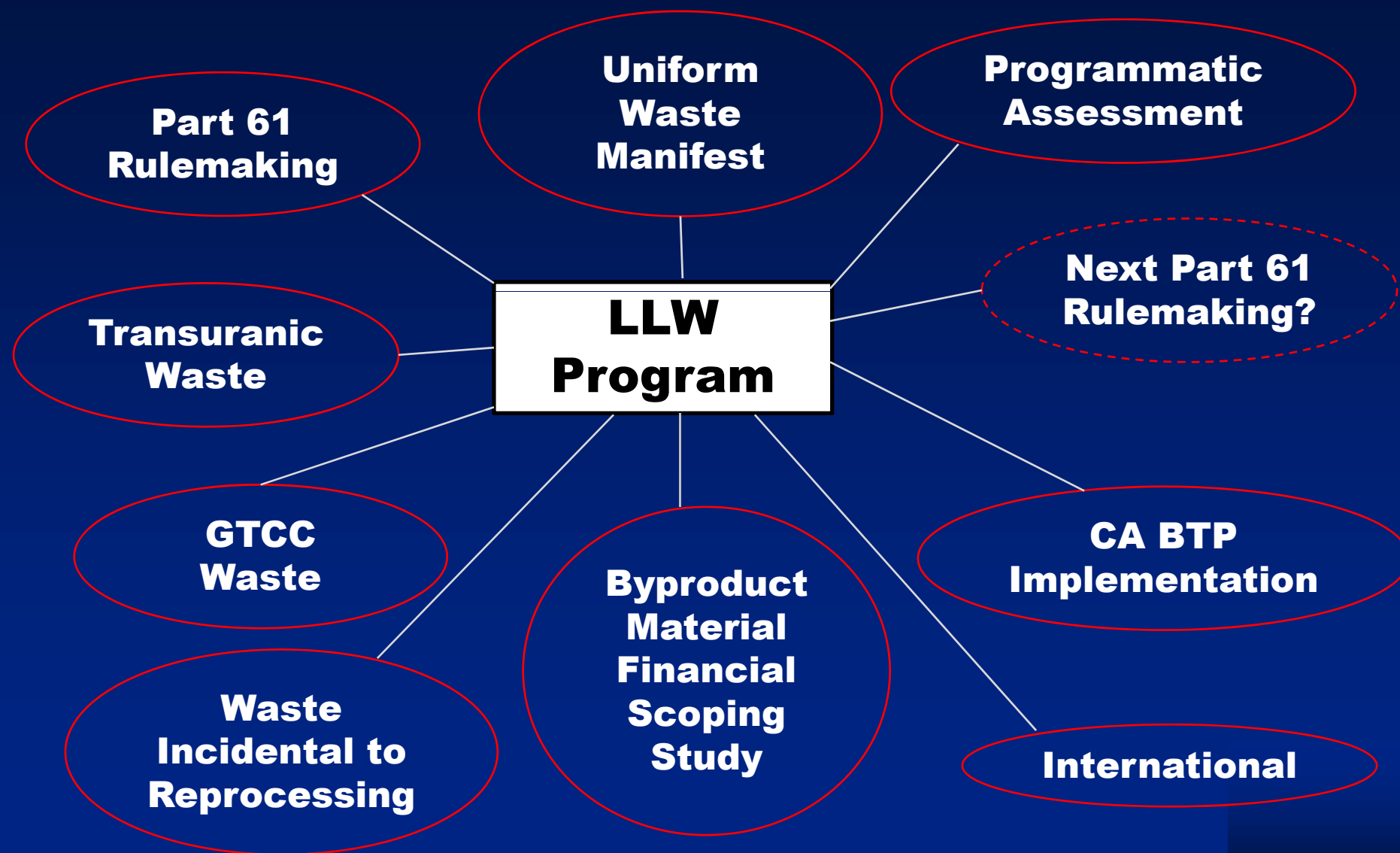
# Commercial LLW Sites in U.S.



Facility	Waste Class
Hanford, WA	A, B, C
Clive, UT	A only
Barnwell, SC	A, B, C
Andrews County, TX	A, B, C



# LLW Program Overview



## **Major Policy Issues in LLW**

- **Proposed 10 CFR Part 61 Rulemaking and Guidance**
- **Greater-than-Class C (GTCC) waste**

## **Programmatic Challenges**

- **Maintaining the Program While Coping with Uncertainties**
- **Maintaining Staff/Knowledge Management**
- **Ensuring Materials Sites have Adequate Funds for Decommissioning**
- **Ensuring Operators Understand and Provide Adequate Decommissioning Documentation**
- **Ensuring Stakeholders are Appropriately Involved in the Process**



## **The Future U.S. Energy Market**

- **Low Natural Gas Prices**
- **Reliance on Non-Nuclear Renewable Energy Sources**
- **Economics of Nuclear Power**
- **Premature Shutdown**

# Thank You!

## Questions?



Back Up Slide

# West Valley Demonstration Project

