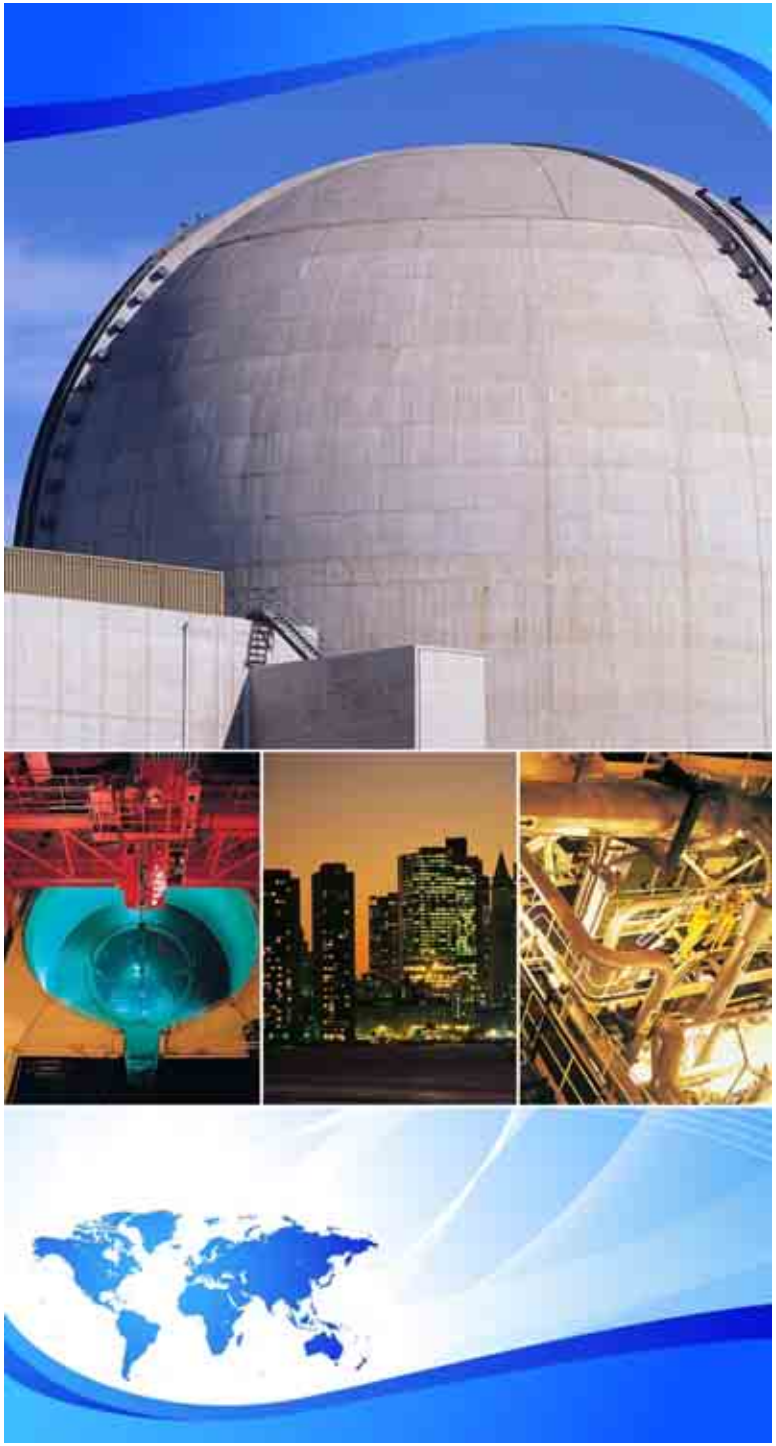

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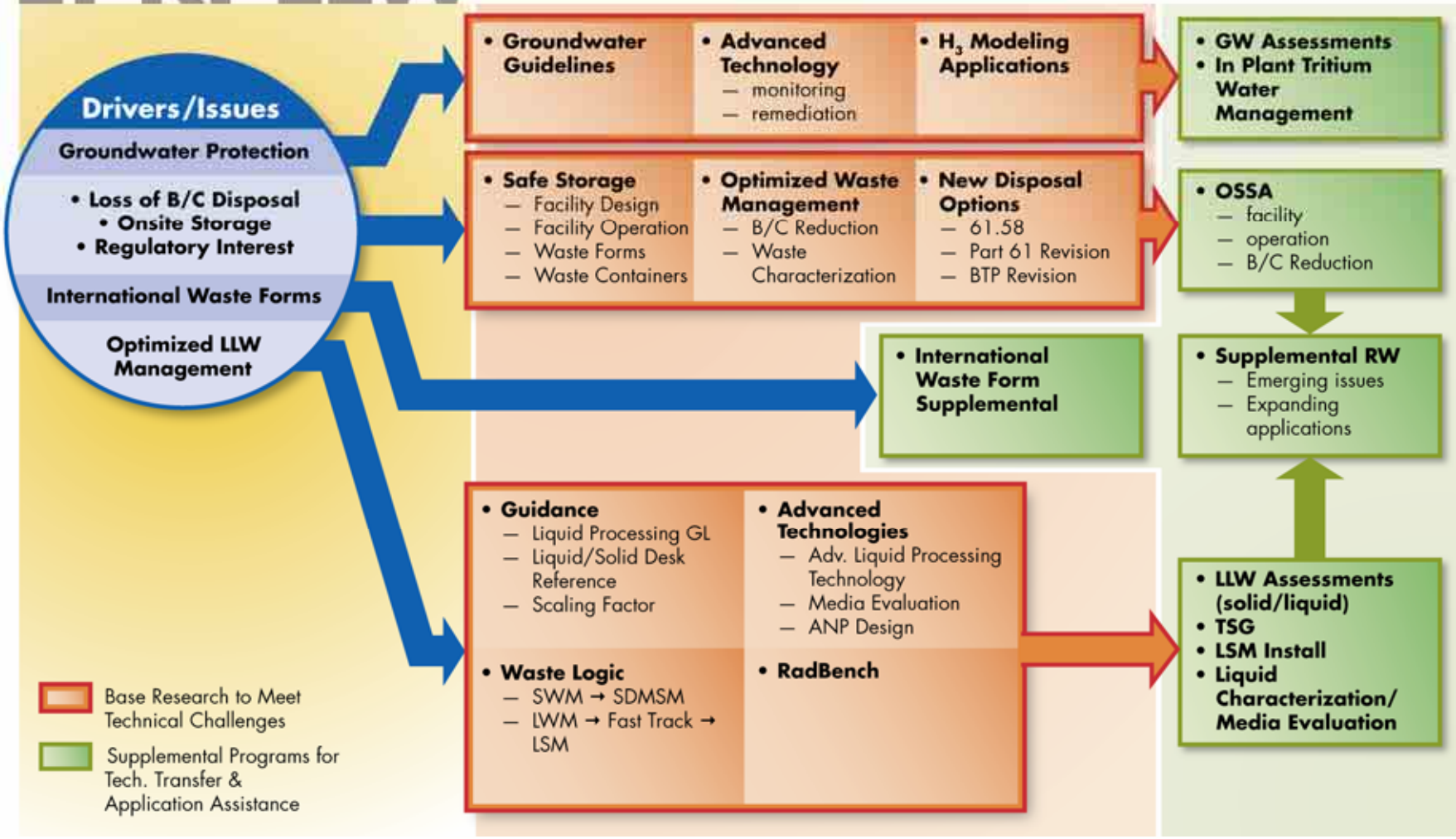
EPRI LLW Disposal and Waste Storage Research Program

WM 2009

March 2, 2009

Lisa Edwards
Sr. Project Manager

EPRI LLW



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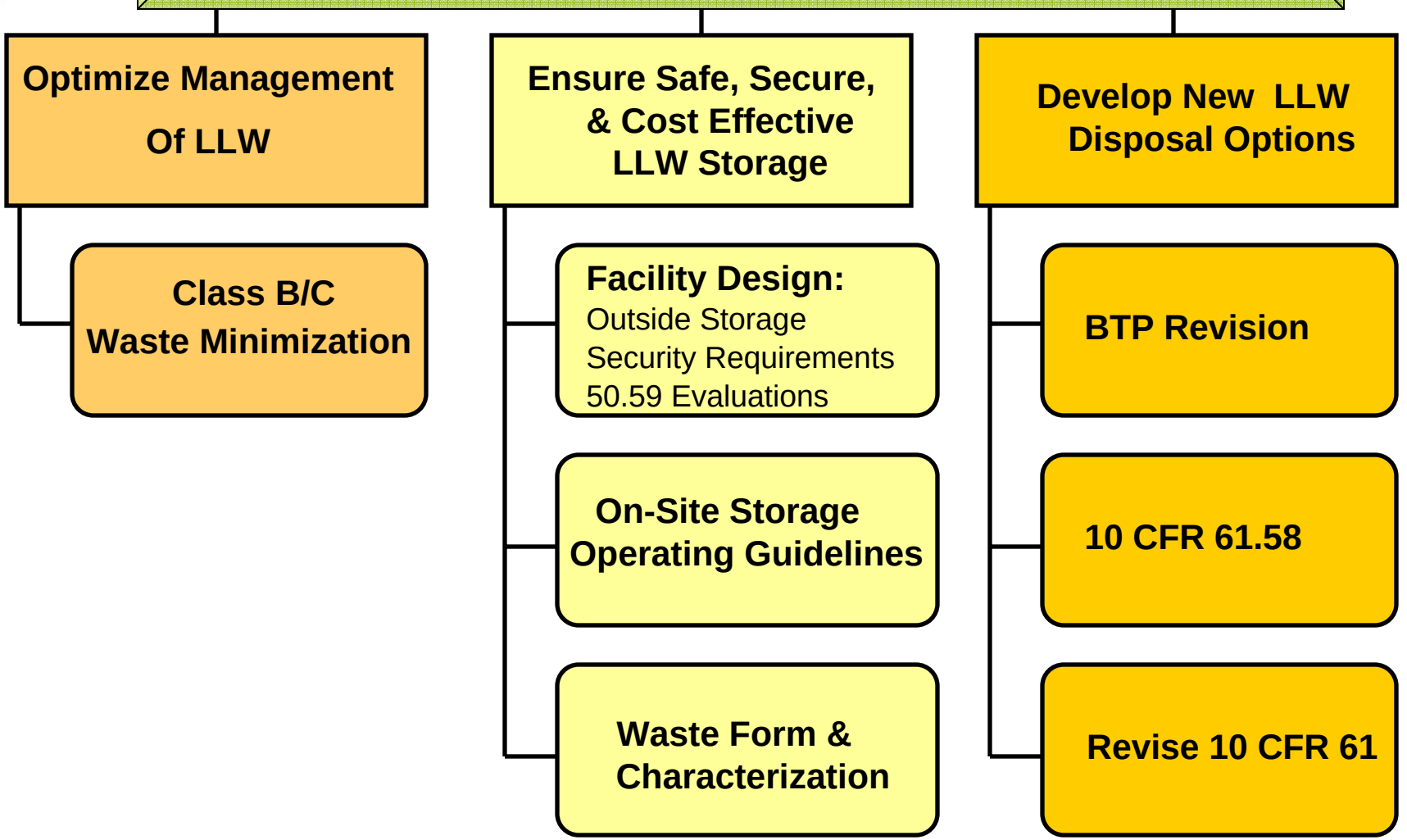
EPRI R&D Strategy
to Address
Expansion of Disposal Options



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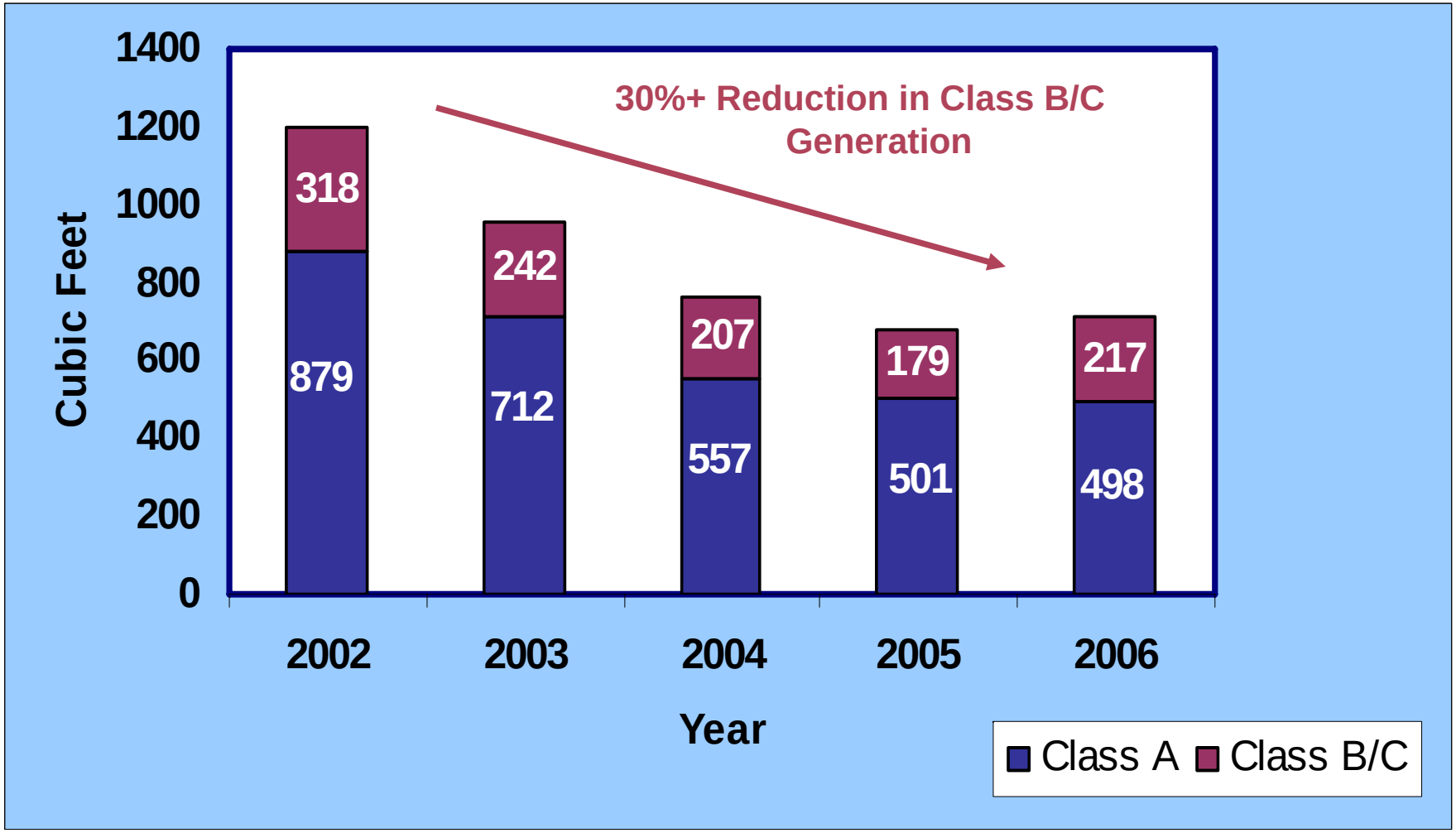
EPRI LLW Program – 2007-2009 Deliverables

- **Waste Class B/C Reduction Guide, (1015115,11/2007)**
- **BTP Technical Basis (1016761, 11/2008)**
- **On Site Storage Operating Guidelines (1018644, 02/2009)**
- **Waste Form Strategy Document (1016762, 11/2008)**

U.S. PWR Generated Class A & B/C Wet Solid Waste Volumes, 2002-2006



Source: EPRI RadBench Web

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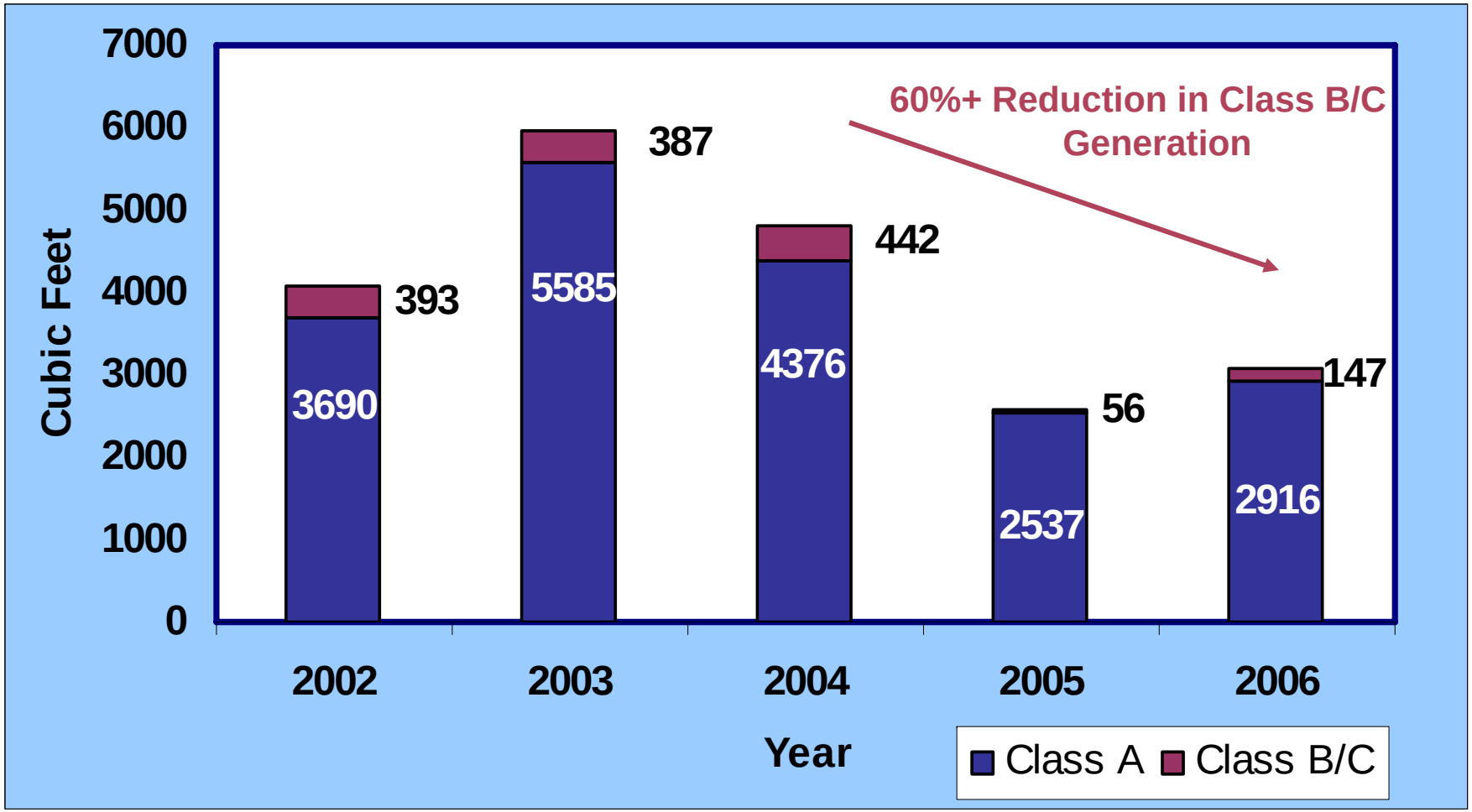
U.S. BWR Generated Class A & B/C Wet Solid Waste Volumes, 2002-2006



Source: EPRI RadBench Web

On Site Storage Assessments

Driver: Loss of Access to Class B/C Disposal

Focus:

- OSS Operating Guideline Compliance
- Application of B/C Reduction Techniques

Benefits:

- Confidence That Program Will Bear Regulatory Scrutiny
- Satisfies GL Recommendation for Independent Review
- Reduced B/C Waste Generation
- Common Issue : 50.59 Evals Out-of-Date

- 2007 & 2008: McGuire, Ft.Calhoun, Comanche Peak, North Anna
- 2009:Ft. Calhoun, Susquehanna, Songs, Surry, Kewaunee

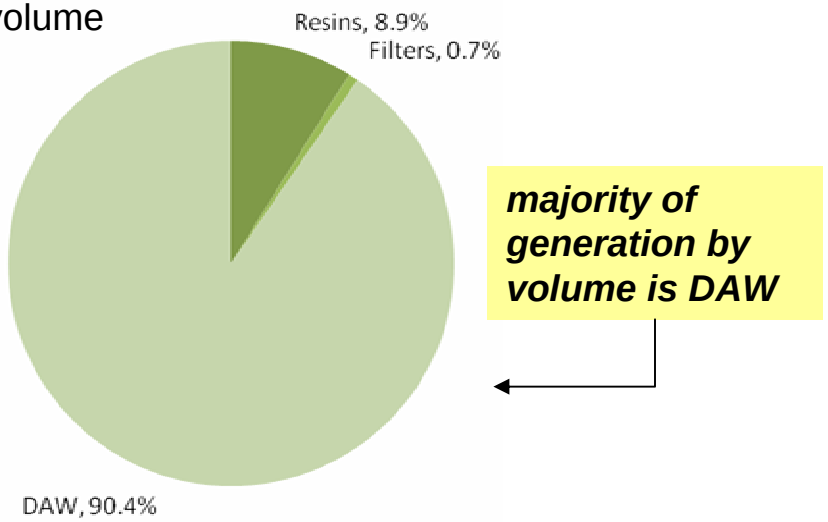
On-Site Storage Operating Guideline

- **Broad Industry *Involvement and* Support**
- **Submitted to NRC, May, 2008**
- **NRC Issued RIS 2008-32, Interim LLRW Storage at NPPs, December, 2008**
  - **States that EPRI Guideline Report on LLW Storage,**

"provides an acceptable method for recordkeeping, determining waste forms and waste containers and monitoring and inspecting the interim long-term storage of LLRW."

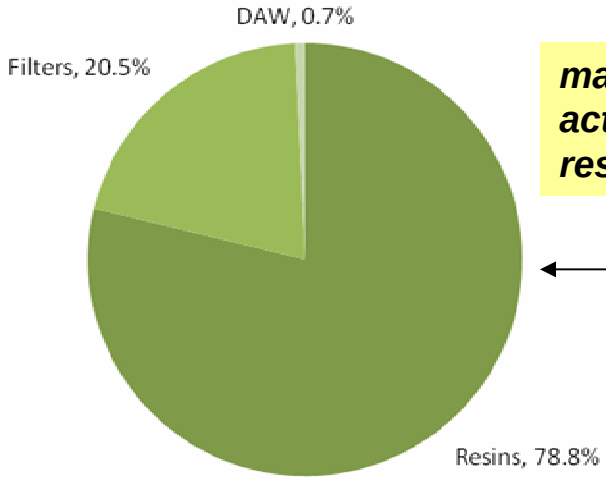
Result- Industry Waste Profile Per Year (BU)

By volume



majority of generation by volume is DAW

By activity



majority of activity is resin waste

- Resins
  - Charcoal
  - Ion exchange media
- Filters
  - Filter media
  - Mechanical filter
- DAW
  - Compactable trash
  - Non-compactable trash
- Industry Totals
  - DAW = 938,000 Ft3
  - Resins = 98,800 Ft3
  - Filters = 7,500 Ft3
  - Total = 1,089,300 Ft3

Small volume ≠ Small radioactivity content

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Results- Dose Impacts from Current Inventory of Operational Wastes (BU)

- RESRAD Simulation of Resident Intruder Scenario
- Includes All Operational Wastes
- Cs-137 accounts for 96% of risk for 100 Year Intruder

Nuclide	% of Dose Rate
Cs-137	**96.20%**
Sr-90	2.44%
Ni-63	0.77%
Pu-239	0.20%
Co-60	0.12%
Pu-241	0.09%
Am-241	0.07%
Nb-94	0.04%
Pu-238	0.03%
C-14	0.00%
Cm-242	0.00%

Results- Cs-137 Dose Rates Based on Different Averaging Scenarios- (BU)

Case #	Description	Total Volume (m3)	Total Activity (Ci)	Conc. (Ci/m3)	Cumulative Performance (mrem/yr)1
1	DAW Only	26103.8	12	4.6E-04	2
2	Case 1 + Process Waste (Cs-137 concentration < 1 Ci/m3)	28632.8	209	7.3E-03	32
3	Case 2 + Process Waste (Cs-137 concentration > 1 Ci/m^3 and < 10 Ci/m3)	28819.6	844	2.9E-02	127
4	Case 3 + Process Waste (Cs-137 concentration >10 Ci/m^3)	28851.5	1750	6.1E-02	264

[1] Annual Intruder Exposure (Intruder-Agriculture Scenario). Direct gamma exposure calculated with Microshield.

Summary:

- **Protection to Intruder is Still Maintained Even When All Materials are Averaged**
- **Activity Content is Still Within Class A Limits for Cs-137 (<1 Ci/m^3)**
- **Dose Still Meets the Disposal Site Requirement of <500 mr/yr**

Summary of EPRI Research on Proposed Changes to the BTP

Topic	Requested Change
Averaging Basis	**Allow concentration averaging over volume of trench instead of package**
Homogeneous Materials	**Release Factor of 10 constraint on averaging**
Cartridge Filters	**Treat as DAW**
Activated Metals	**Eliminate primary gamma constraint, average over package volume**

Potential Benefits:

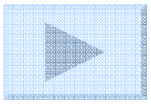
- If Broader Waste Stream Averaging is Allowed by the NRC:
  - Increases the Quantity of Class A Resin Waste Volume from **86% to 92%**.
  - Reduces On-Site Storage Quantities
  - Implementation Within Current Regulatory Framework
- **Industry Cost Savings:**
  - 8,000 Ft^3 of B/C Resin Would Be Disposed as Class A, Which Represents **$20-36 M per year cost savings**

BTP – What's Next?

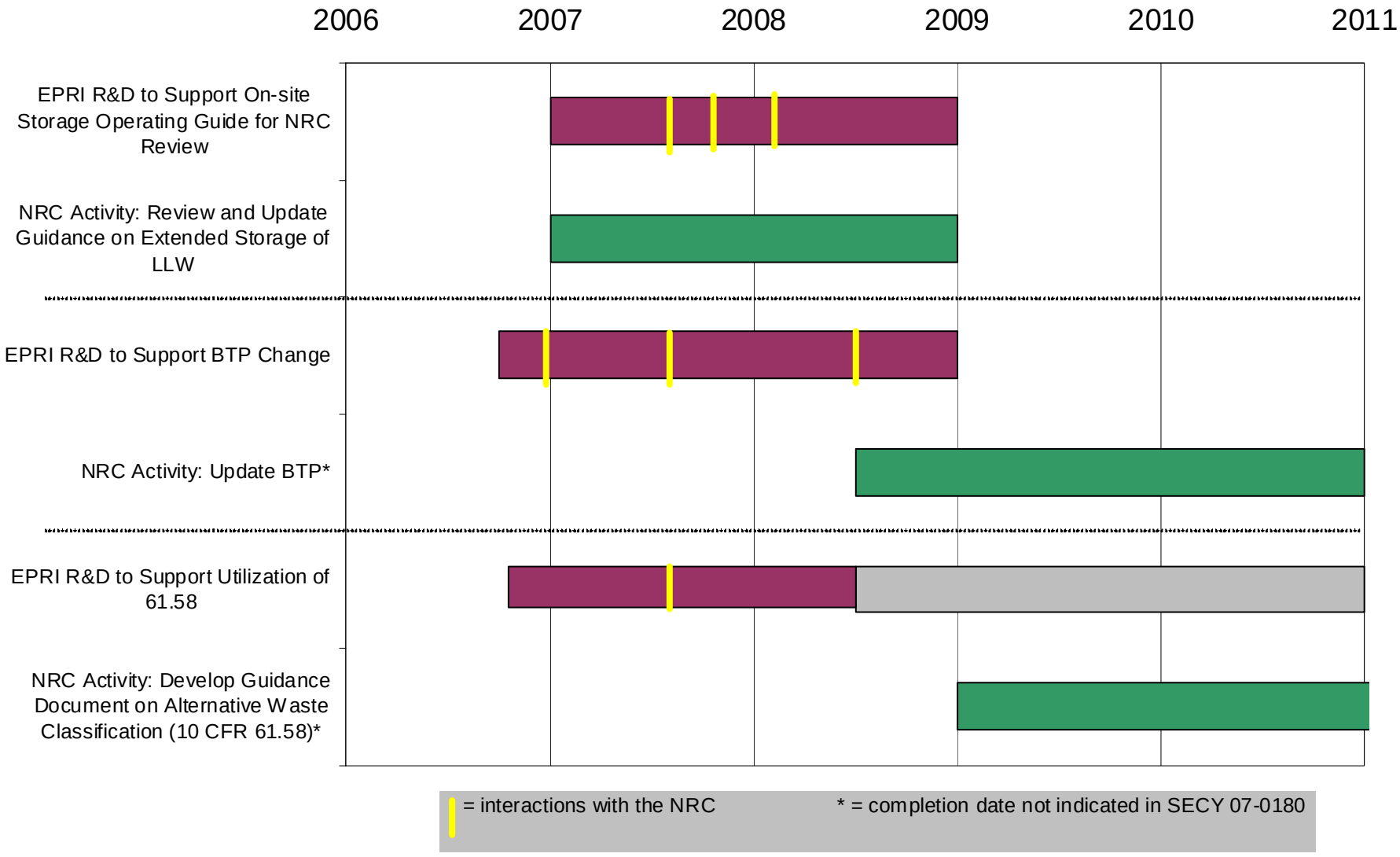
- **Provide NRC (via NEI) With Published Report – Complete**
- **NRC: Make Recommendations To Commissioners Regarding *Possible* Changes To The BTP**
- **Maintain NEI/NRC Interactions Throughout Research Phases**
- **Discuss EPRI Technical Findings:**
  - **Areas Of Agreement**
  - **Technical Constraints**
  - **Supplemental Analyses Requirements**

Research Focus for 2009-2010: 10 CFR 61.58

- **Changes To BTP May Provide Immediate Benefits; However, Industry Still Has A Single Point Vulnerability- Longer Term Solutions Are Needed**
- NRC Is Open to Receiving Industry Input To Assist In The Development Of Guidance For Implementing Alternative Disposal Criteria Utilizing 10 CFR 61.58
- EPRI Proposes To Develop Model Criteria And Guidance For The Utilization Of Alternative Intruder Scenarios Based On Current/Updated Disposal Technologies And Site Specific Environmental Parameters



EPRI Research Strategy to Support Regulatory Changes to Resolve Waste Disposal Problem



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EPRI LLW Disposal Program Summary

- **Reduce the Generation of Class BC Waste:** Waste Class B/C Reduction Guide, (1015115,11/2007)
- **Safely Store Waste On-Site:** On Site Storage Operating Guidelines (1018644, 02/2009) Waste Form Strategy Document (1016762, 11/2008
- **Expand Disposal Options:** BTP Technical Basis (1016761, 11/2008), Future Work on 10CFR61.58, long term 10CFR61