



EPRI Investigations Related to Updating the U.S. LLW Classification System

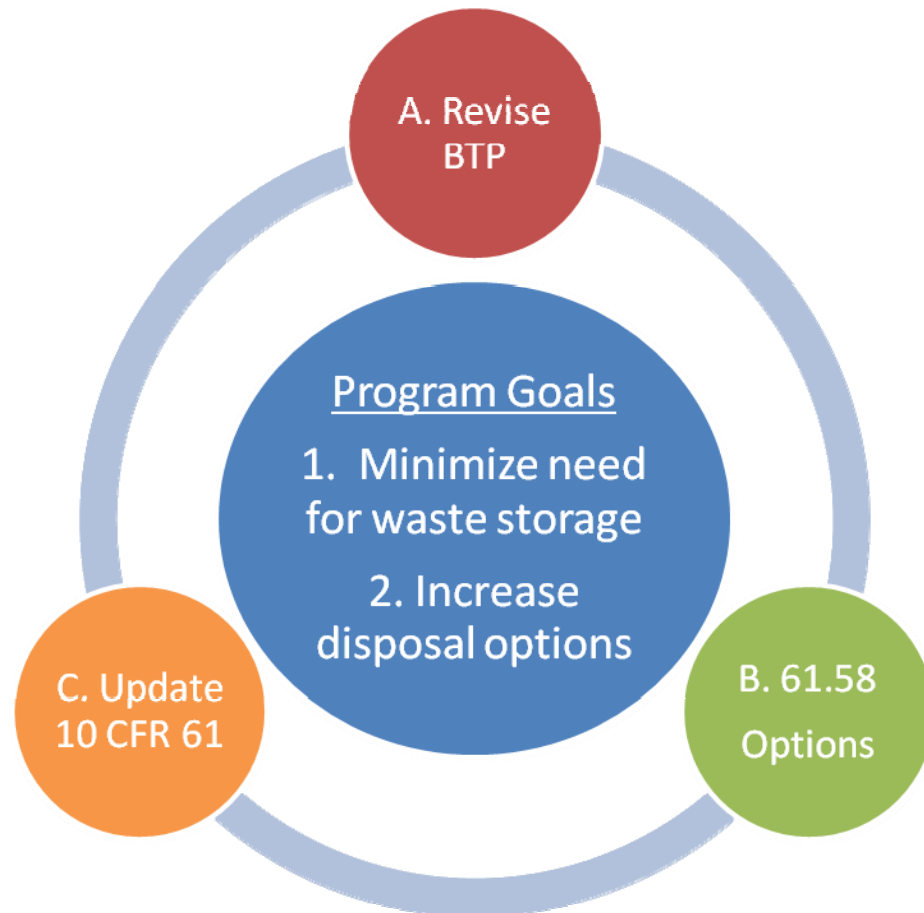
**Sean Bushart- EPRI Sr. Program Manager
Chemistry, LLW and Radiation Mgt.**

US NRC Regulatory Information Conference
Session on "Potential Changes to the U.S.
Low Level Waste Regulatory Framework"

March 11, 2010

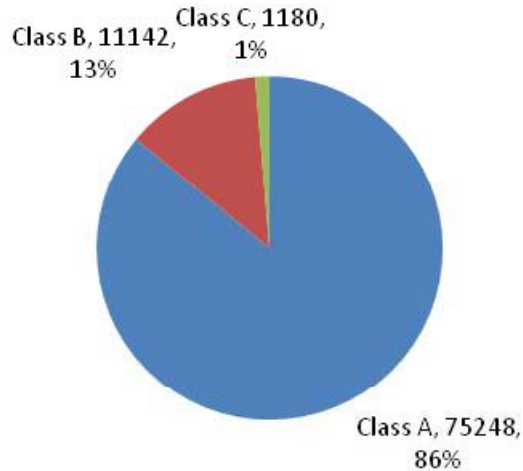
EPRI Investigations Contribute to Technical Basis for Long Term Effort of Modifying 10CFR61

- **Proposed BTP Modifications to Expand Blending Options**
- **Work Performed via 61.58 Leads Directly to Risk-Informing Part 61**
- **Update of 10 CFR 61 Expands Upon Concepts Introduced in 61.58 Project**

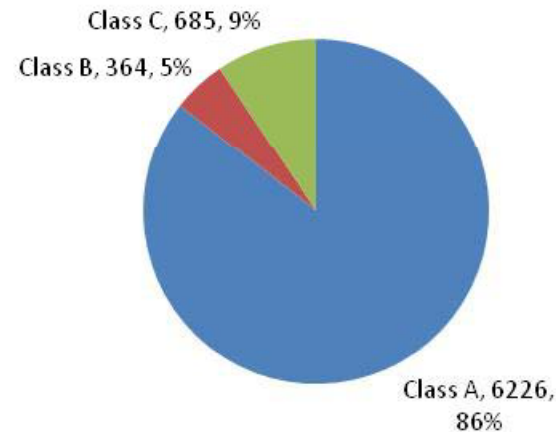


Background: Estimation of Nuclear Power Plant Annual LLW Waste Volumes by Waste Class

Average Annual Resin Waste Volumes by Waste Class



Average Annual Filter Waste Volumes by Waste Class



Industry Distribution (Resin +Filters):

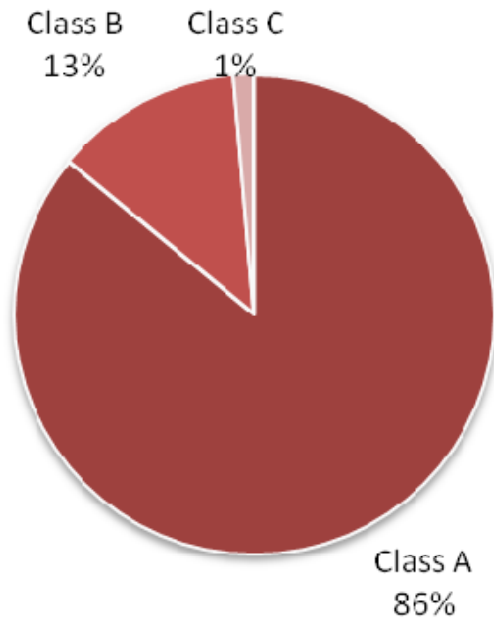
- 86% Class A (81,500 Ft³)
- 12.1% Class B (11,500 Ft³)- majority from resins
- 1.9% Class C (1,860 Ft³)

Radionuclides driving overall classification:

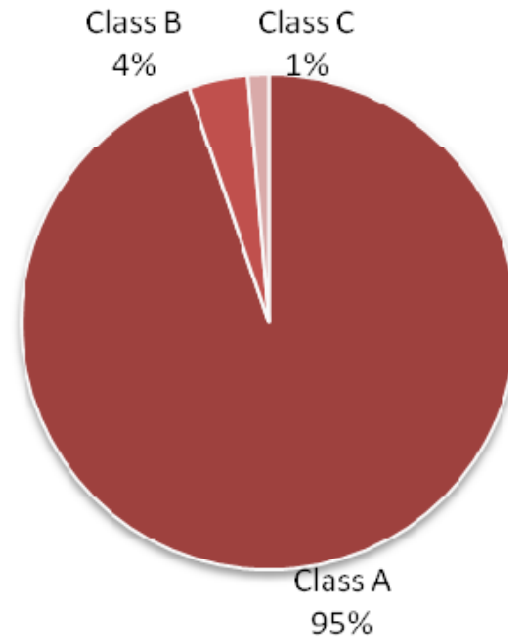
- Ni-63
- Cs-137
- Sr-90

Potential Disposal and Storage Impacts from Broader Averaging- Resins

Generator Current Practice



Industry Wide Averaging



65% Reduction in Storage Needs

Dose Impacts from Current Inventory of Operational Wastes

- Cs-137 accounts for 96% of industry risk
 - Using RESRAD simulation of Resident Intruder Scenario
 - Includes all operational wastes

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%

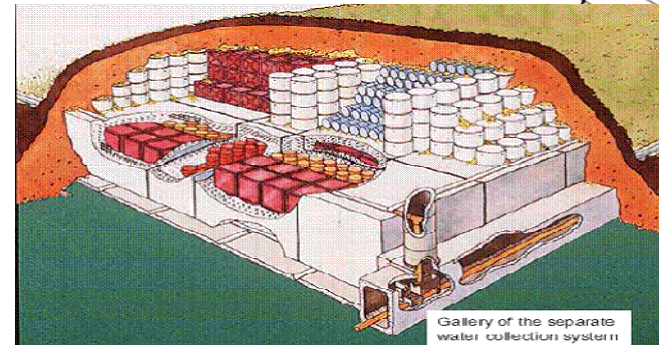
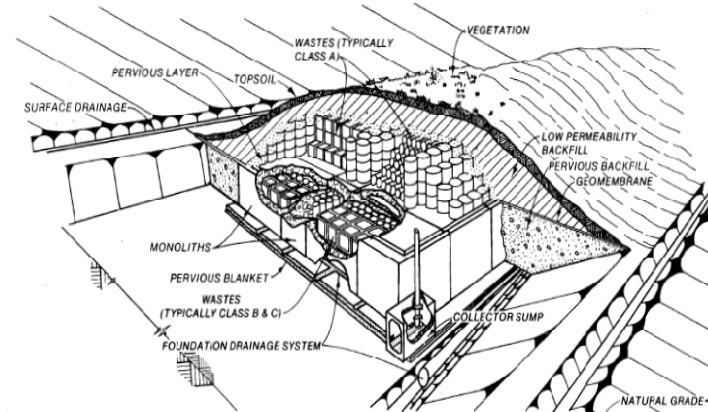
Looking Forward: Existing Classification Criteria are Marginally Relevant

Original Bases for 10 CFR 61



“Dump And Roll” – 2 m Soil Cover

Proposed Disposal Designs



Engineered Barriers Not Credited In Protection Analysis

Current Study: Risk Assessment of Key Radionuclides

Study Goal: To determine relative risk of industry generated LLW by radionuclide

Evaluates developments such as:

Updated ICRP Dose Correction Factors

Modern Disposal Facility Engineered Barriers

Radionuclide	Regulatory Consideration
Cs-137	Defines institutional control period
Ni-63	Using current ICRP Dose Correction Factors limits will increase by factor of 15
Sr-90	Using current ICRP Dose Correction Factors limits will increase by factor of 7

General Comments Regarding 10 CFR 61

- Cs-137 figures prominently in overall classification and intruder risk
- 10 CFR 61 rulemaking was biased by disposal practices of 1980
- A,B and C Waste Classes may not be necessary if the disposal site itself provides the structural stability and some intruder protection

For More.....

- EPRI will publish a technical report later in 2010 describing the results to date from the latest phase of work
- These reports already published related to concentration averaging:
 - [Investigation of Low Level Radioactive Disposal Regulations and Practice: Recent Experience and Current Practices \(Interim Report\)](#)
1019222, Nov. 09
 - [Proposed Modification to the NRC Branch Technical Position on Concentration Averaging and Encapsulation \(BTP\)](#)
1016761, Nov. 08
 - [An Evaluation of Alternative Classification Methods for Routine Low Level Waste from the Nuclear Power Industry](#)
1016120, Nov. 07