

Improving the Regulation and Management of Low-Activity Radioactive Wastes

**John R. Wiley
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Outline of Talk

- Who we are
- Approach
- Results of Phase I
- Outlook for Phase II
- Your input requested

The National Academies

- **National Academy of Sciences (NAS)**
- **National Academy of Engineering (NAE)**
- **Institute of Medicine (IOM)**
- **National Research Council (NRC)**
Nuclear and Radiation Studies Board
- Private, nonprofit, Congressionally chartered (1863) to provide scientific and technological advice to the nation
- Our experts serve *pro bono*
- Information gathering meetings are open to the public

Reasons for the Study

This project was initiated by the National Academies' Board on Radioactive Waste Management, which observed that statutes and regulations controlling low-activity radioactive wastes (LAW) have evolved as a patchwork over the past 60 years.

- Wastes from some origins may be over-regulated relative to their radiological hazards, increasing costs and other burdens on the generators and potentially increasing worker risks.**
- Radiological hazards of other LAW may be greater than generally perceived.**

Statement of Task

- 1) Using available information from public domain sources, provide a summary of the sources, forms, quantities, and hazards of low-activity waste in the United States;
- 2) Review and summarize current policies and practices for regulating and managing low-activity waste, including treatment and disposal practices; and
- 3) Provide an assessment of technical and policy options for improving practices for regulating and managing this waste to enhance technical soundness, ensure continued protection of public and environmental health, and increase cost effectiveness.

Committee Members and Expertise

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Phase I

The committee developed five waste groups that we believe are inclusive of LAW from all sources (DOE, nuclear utilities, other industries, medicine, research, mineral recovery).

The groups emphasize the physical and radiological characteristics of the wastes, rather than their origins. We chose this approach to emphasize inconsistencies, gaps, and suggest ways to improve the current LAW regulatory/management system. Not a proposal for a new categorization scheme.

Low-activity Waste Groups 1-3

Three groups include wastes that are defined and regulated as low-level wastes. They are subject to the same statutory definition and controls (AEA, NWPA, LLWPA), but have different physical and radiological characteristics.

1. **Wastes that fit comfortably in USNRC classes A, B, C.**
 - Typical “Barnwell” commercial waste
 - DOE “burial ground” waste
2. **Slightly radioactive solid materials from decommissioning and cleanup.** These push the low end of USNRC class A. They produce very low or essentially non-detectable levels of radiation and arise in large volumes.
3. **Discrete sources (sealed sources).** These can push the upper end of USNRC class C (GTCC). Some produce high levels of radiation but their volumes are small.

Groups 4-5

Two groups include wastes that have similar physical and radiological properties (large volumes; U or Th series isotopes) but subject to different regulations.

4. Uranium and thorium mining and processing wastes (AEA)

Post Uranium Mill Tailings Radiation Control Act (UMTRCA) 1978 wastes require disposal in a licensed radwaste facility.

Pre-UMTRCA wastes (mostly AEC "FUSRAP" wastes) have other disposal options.

5. NORM AND TENORM wastes (non-AEA)

- Uneven control by state agencies
- Little public perception of radiation hazard
- Conference of Radiation Control Program Directors (CRCPD) model regulation.

Phase I Findings

FINDING 1:

Current statutes and regulations for low-activity radioactive wastes provide adequate authority for protection of workers and the public.

- **The current system is working; no crisis**
- **Uneven application of authority**
- **The patchwork approach may become less workable in the future.**

Phase I Findings

FINDING 2:

The current system of managing and regulating low-activity waste is complex. It was developed under a patchwork system that has evolved based on the origins of the waste.

- Clear message from information-gathering meetings: A more consistent, simpler, performance-based, risk-informed approach is needed.
- Same message from studies by other organizations (NCRP-139).

Phase I Findings

FINDINGS 3 AND 4:

Certain categories of low-activity wastes have not received consistent regulatory oversight and management.

Current regulations for low-activity wastes are not based on a systematic consideration of risks.

- NORM/TENORM state regulation
- Uranium/thorium wastes pre- and post-UMTRCA
- Decommissioning waste (SRSM) Versus NORM/TENORM
- Waste shipments versus local disposal

Phase II Task

(3) provide an assessment of technical and policy options for improving practices for regulating and managing LAW to enhance technical soundness, ensure continued protection of public and environmental health, and increase cost effectiveness.

This assessment should include an examination of options for utilizing risk-informed practices for regulating and managing low-activity waste irrespective of its classification.

Phase II Schedule

- Kick-off public information gathering meeting, Washington, DC, November 30.
- Ten-month study period to produce peer-reviewed National Academies' report in Fall 2005.

NMA Issues

- Disposal of non-11e.(2) wastes in U mill tailing impoundments (NMA-FCFF white paper).
- TENORM wastes from mining (e.g., rare earths, phosphate).

Written input welcome!

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Project Sponsors

- **Army Corps of Engineers**
- **Department of Energy**
- **Environmental Protection Agency**
- **Nuclear Regulatory Commission**
- **Southeast Compact Commission**
- **California EPA**
- **DOD Executive Agent for LLW**
- **Institute of Applied Energy—Japan**
- **Institute for Radiation Protection and Nuclear Safety—France**
- **Midwest Interstate Compact Commission**