

## SCHEDULING NOTE

**Title:** **BRIEFING ON PROPOSED REVISIONS TO 10 CFR Part 61 and LOW-LEVEL RADIOACTIVE WASTE DISPOSAL (Public)**

**Purpose:** To brief the Commission on the 10 CFR Part 61 rulemaking and Low-Level Radioactive Waste Disposal

**Scheduled:** **June 25, 2015**  
**9:00 AM**

**Duration:** Approx. 3 hours

**Location:** Commissioners' Conference Room, 1<sup>st</sup> fl OWFN

**Participants:**

**Panel 1 - External Stakeholders** **60 mins.\***

**Mike Garner**, Executive Director  
Northwest Interstate Compact **10 mins.\***

**Ralph Andersen**, Senior Director, Radiation Safety and  
Environmental Protection, Nuclear Energy Institute **10 mins.\***

**Dan Shrum**, Senior Vice President of Regulatory Affairs,  
EnergySolutions **10 mins.\***

**Scott Kirk**, Executive Vice President, Licensing and  
Regulatory Affairs, Waste Control Specialists **10 mins.\***

**Perry Robinson**, General Counsel, Louisiana Energy Services  
(URENCO USA) **10 mins.\***

**Matt Pacenza**, HEAL Utah **10 mins.\***

Topic:  
• Site-Specific Analysis Rulemaking

**Commission Q & A** **40 mins.**

**Break** **5 mins.**

**Panel 2 - Regulators (NRC and Agreement States)**

**40 mins.\***

**Mark Satorius**, Executive Director for Operations

**Scott Moore**, Deputy Director  
Office of Nuclear Material Safety and Safeguards (NMSS)

**Larry W. Camper**, Director, Division of Decommissioning,  
Uranium Recovery and Waste Programs, NMSS

**Rusty Lundberg**, Director, Utah Division of Radiation Control and  
Organization of Agreement States

**Charles Maguire**, Director, Radioactive Materials Division,  
Texas Commission on Environmental Quality

**Topics:**

Site-Specific Analysis Rulemaking

- Historical Perspective
- Proposed technical revisions
- Challenges
- Guidance

Overview of Low-Level Waste Program

- Highlight programmatic successes
- Ongoing Activities\*\*

**Commission Q & A**

**40 mins.**

**Discussion – Wrap-up**

**5 mins.**

\*For presentation only and does not include time for Commission Q & A's

\*\*Only a high level overview of these topics will be provided as they will be discussed in more detail during future Commission meetings.



# NRC Commissioner's Briefing Proposed 10 CFR Part 61 Rulemaking

June 25, 2015

Mike Garner  
Chair/Executive Director  
Northwest Interstate Compact



# Background


- Low-Level Radioactive Waste Policy Amendments Act of 1985 defines responsibility for waste management and disposal
  - States and interstate compacts
  - Federal government
- The U.S. Enrichment Corporation Privatization Act defines responsibility for depleted uranium disposal
  - U. S. Department of Energy is responsible; not states and interstate compacts





# Background

- New low-level waste disposal facilities needed by 2050
  - Richland, WA facility will begin closure activities in 2056
  - EnergySolutions has 30 years of licensed capacity remaining
  - Additional nuclear utilities scheduled to be decommissioned in next 20-40 years



# Purpose of Proposed Rulemaking

- NRC needs to develop regulations addressing the disposal of unanticipated waste streams such as large volumes of depleted uranium at commercial sites
- 2 commercial sites are interested in accepting large volumes of depleted uranium for disposal
  - Waste Control Specialists – Andrews County, TX
  - EnergySolutions – Clive, UT





# Future Site Development

- Site development depends on:
  - Technical analysis demonstrating low-level waste is disposed in a manner that is protective of public health and safety
  - Just as importantly it requires the public's support before initiating site development
  - Stability in regulations governing low-level waste facility operation



# Unintended Impacts of Rule

- Changes the dynamics as found in the Low-Level Radioactive Waste Policy Amendments Act regarding site development
  - Depleted uranium is not a state or compact responsibility
- Commercial sites not accepting large volumes of depleted uranium will be subject to the economic burden of implementing the rules with no economic benefit
  - Will result in increased disposal fees for low-level waste generators using the Richland, WA site





# Unintended Impacts of Rule

- Application of the rule to all commercial sites undermines the stability of regulations governing low-level waste disposal
  - States may be hesitant to support site development as the rules can change at any time to allow extremely different waste streams than those contemplated during the original public process
  - May make the public hesitant to support site development



# Unintended Impacts of Rule

- It is unlikely that a new site meeting the requirements of the proposed rule would be able to receive the public support necessary for site development
  - Such a site has never been developed and is likely un-siteable





# Reduce Unintended Impacts

- The new rule should apply only to those commercial sites seeking large volumes of depleted uranium for disposal
  - This could be accomplished through the inclusion of these requirements within a separate section or subpart of 10 CFR Part 61 that applies only to those sites seeking large volumes of depleted uranium or other long-lived radionuclides for disposal
  - All four sited states support this approach





# Benefits of Alternate Implementation

- Aligns more closely with the tenets of the Low-Level Radioactive Waste Policy Amendments Act
- Limits the economic burden to those sites that will benefit economically from the acceptance of large volumes of depleted uranium for disposal
- Maintains a higher level of stability for rules governing traditional low-level waste disposal
- Makes future site development more difficult, but much less difficult than if the rule is applied to all commercial sites





# Perspective on Part 61 Rulemaking and Low-Level Radioactive Waste Disposal

Ralph Andersen, CHP  
Senior Technical Advisor  
USNRC Commission Meeting  
June 25, 2015 • Rockville, MD



## Summary

- The current regulations “ensure public health and safety are protected in the operation of any commercial LLRW disposal facility”
- Proposed rule goes well beyond addressing safe disposal of “LLRW streams that are significantly different from [those] considered in the current 10 CFR Part 61 regulatory basis...”
- Will introduce unnecessary burden and unintended consequences



## Current Adequate Protection

- Integrated systems approach (current rule) implicitly similar to more explicit defense-in-depth approach (proposed rule)
- Emphasis on passive systems reduces reliance on long-term institutional controls
- LLRW disposal performance objectives are consistent with radiation protection standards employed throughout NRC regulations



## Significantly Different LLRW Streams (adapted from NRC staff presentations)

- Depleted Uranium
- LLRW from DOE operations
- Waste Forms/Volumes
- Blended LLRW
- LLRW streams generated from new technologies



## Intent of Proposed Rule

- Prepare a safety case and perform new site-specific analyses ~~to address safe disposal of significantly different LLRW streams~~
- Identify additional prudent site-specific measures for continued LLRW disposal
- Develop site-specific LLRW acceptance criteria



# Potential Unnecessary Burden and Unintended Consequences

- Required for all existing and new facilities – whether or not for disposal of significantly different LLRW streams
- Subordinates the existing waste classification criteria
- Implementation of a new approach introduces new uncertainties for present and future business decisions



# Preliminary Comments (Work in Progress)

- Provide for excluding existing facilities not pursuing disposal of significantly different LLRW streams
- Allow for use of site-specific waste acceptance criteria (e.g., for disposal of significantly different LLRW streams) and/or continued use of existing LLRW classification requirements
- Compatibility level implications should be more fully explored in regard to state- and site-specific issues
- Consider other changes in progress (e.g., LLRW branch technical position and regulatory issue summary on LLRW manifest reporting)
- Implications for possible future updating of the Waste Classification tables should be addressed prior to issuance of a final rule

# Comments on Proposed Rule Regarding Low Level Radioactive Waste Disposal

June 25, 2015

Daniel B. Shrum  
Senior Vice President,  
*Energy Solutions*



## Summary of Issues

- Addition of performance assessment derived waste acceptance criteria
- Defense in depth
- Proposed rule is overly complicated
- Complications and inconsistencies
- Stability at 10,000 years
- Grandfathering provision
- Unintended consequences motivating unlicensed disposal

## Performance assessment derived waste acceptance criteria

- Using waste acceptance criteria in lieu of tables in 10 CFR 61.55 is technological advancement
- Superior to the limits in the tables
  - Based on site-specific conditions
  - Incorporate most recent ICRP guidance
  - Account for volumes and activity of waste disposed
- No revision to generic tables could improve on a site-specific approach



## Defense in Depth

- Appreciate the inclusion of a safety basis and the emphasis on defense in depth
- Proposed rule misapplies the concept of defense in depth
- Requirements for an “analysis” should be removed, e.g., 61.13(f)
- Analysis suggests quantitatively demonstrating the value of redundant systems
- Defense in depth comes from layers of protection
  - Suitable site geology + stability + proper package + activity limits = defense in depth

## Proposed rule is overly complicated

- Revision of Part 61 initiated as a “limited scope rulemaking” (SRM-SECY-08-0147)
- As proposed, it is not limited nor readily understandable
- Amount of detail in §61.7 and §61.13 is excessive
- Significant volume of detail in §61.7 not related to intent of limited scope
- Most additions to §61.13 belong in guidance
- These additions don’t strengthen rule or contribute to health and safety



## Complications and Inconsistencies

- From NUREG-1275
- Other Disruptive Processes (§5.1.1.3) – No reference to this term in the rule
- “Licensees should examine plausible scenarios for site evolution and characteristics in the site stability analysis” – directly conflicts with the SRM-SECY-13-0075 “only if scientific information compelling such changes from the compliance period is available”
- “Defense-in-depth analysis” – conflicts with SRM-SECY-13-0075 “clear statement that licensing decisions are based on DID protections”

## Stability at 10,000 years

- The rule requires demonstrating site stability at 10,000 years
- §61.44 – “disposal facility must ... achieve long-term stability of the disposal site for the compliance and protective assurance periods...”
- Inconsistent with Commission direction, which explicitly refers to a “reasonable analysis”
- Technically infeasible – stability cannot be demonstrated to be stable for 10,000 years



## Grandfathering provision

- It is not reasonable to apply new rule to all existing and future LLW disposal sites – criteria should be fit for purpose
- The “limited scope” rulemaking was intended to address waste streams not previously analyzed for disposal
- Sites not disposing of such waste streams should be grandfathered
- Propose a standard similar to that used in Utah
  - Based on volume of depleted waste disposed
  - >1 tonne total depleted uranium

## Unintended consequences

- Complexity and cost of proposed rule will lead to unlicensed disposal of radioactive waste
- The Commission should include provisions for the disposal of low activity waste streams
- Absent that, more waste streams can be expected to go to disposal under 20.2002
- Waste streams allowed under 20.2002 are not adequately regulated
  - No regulatory control
  - No formal guidance





A N D R E W S , T E X A S

WCS' Perspectives Regarding the Site Specific Analysis  
Rulemaking under Part 61

J. Scott Kirk, CHP,  
Vice President of Licensing & Regulatory Affairs  
NRC Commissioners' Briefing  
25 June 2015, Rockville, Maryland





# Proposed Rulemaking

- WCS commends the staff's efforts to develop a proposed rulemaking for Unique Waste Streams.
- WCS supports the three tiered approach, as provided in the proposed rule.
- WCS also supports the radiation dose limits to protect the public and an inadvertent intruder.
- WCS recently received authorization to dispose of large quantities of DU with requirements more stringent than those in the proposed rule.





# Community Support

- WCS opened the first new disposal facilities in over 40 years.
- State, regional, and local communities are supportive of the nuclear industry.
  - WCS, URENCO, WIPP, and International Isotopes.
- Strong community support was a critical factor in licensing WCS' disposal facilities.







## Vision

- In 2003, Texas legislature envisioned a modern disposal facility that could take both commercial and DOE Class A, B and C LLW.
  - Mandated stringent siting requirements.
  - Required a design similar to monitored, retrievable storage .
  - Required Texas takes title of the waste at time of disposal for the commercial facility.
  - DOE takes title of the waste at the time of license termination for the federal facility.





# Modern Disposal Facility

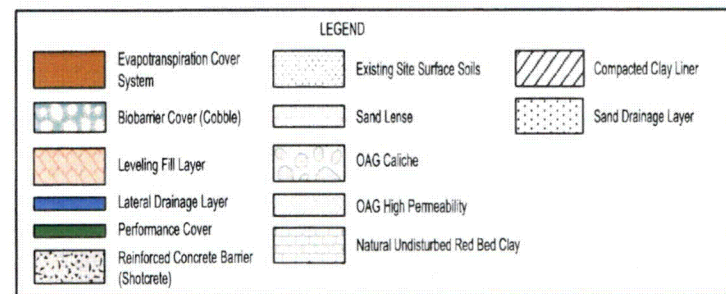
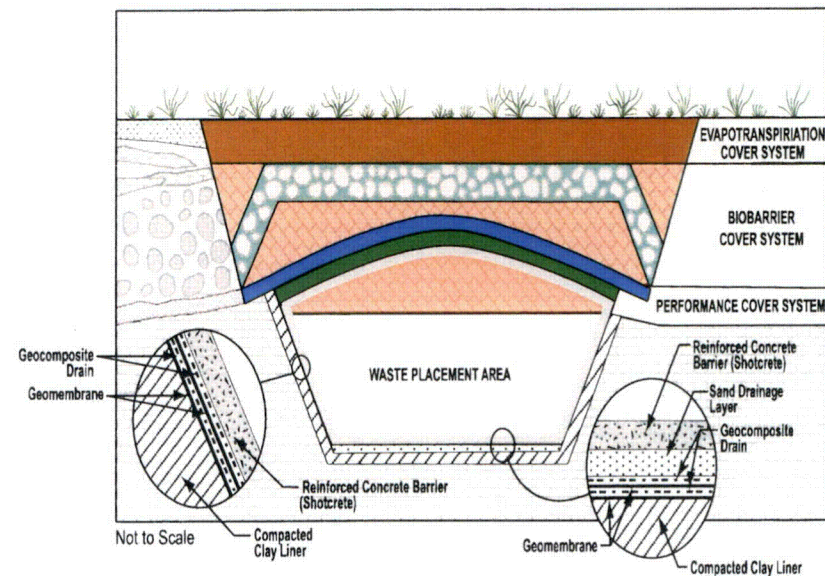
- A modern, well-sited and engineered facility can ensure the isolation of long-life radionuclides beyond 10,000 years.
  - Sited in an arid, remote part of the U.S.
  - Impermeable geology.
  - Far removed from potable water sources.
  - Engineering designs with multiple layers of defense-in-depth.
- Previous disposal sites were located because of their proximity to federal reservations, not based on their environmental performance.



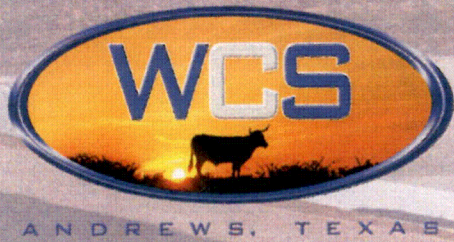


# Site Characteristics and Engineering Design

- A 10 meter engineered cover that is not mounded at the surface.
- A 7 foot liner system that includes a 1 foot reinforced concrete barrier around the entire disposal unit.
- Disposal at depths greater than 30 meters is possible.
- Intruder resistant disposal canisters.







# Site Characteristics and Engineering Design

- All waste is disposed in the Dockum Formation.
  - 500 to 800 feet of impermeable redbed clay.
  - Water tables 600 – 1000 feet below grade.
- Arid climate: rainfall less than 15 inches per year and potential for evapotranspiration of over 60 inches of water per year.
- Hydrus infiltration model incorporated 24-hour rainfall events since 1954.
- The most extensively characterized site for LLW disposal in the U.S.
- Ideal for isolating long-lived radionuclides.



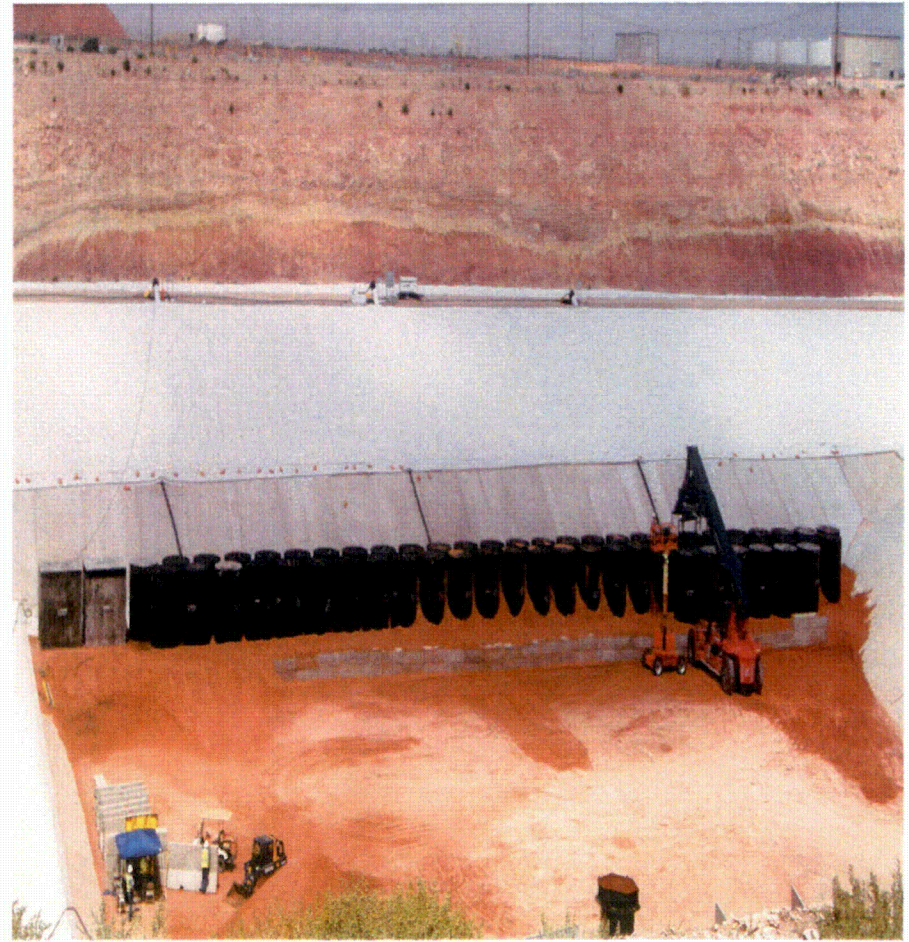


# 40 Years of Change

**Previous Standard for Class B/C LLW**



**A New Disposal Facility**



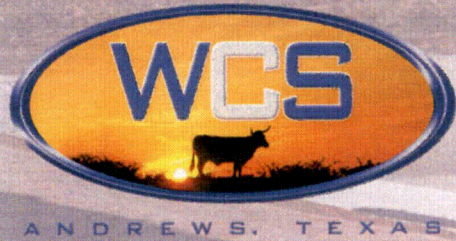




## Disposal of DU Authorized in Texas

- TCEQ regulations requires compliance for 1,000 years or peak dose, whichever is longer.
  - Most stringent Part 61-like regulations in the U.S.
- WCS analyzed disposal of 500,000 m<sup>3</sup> of DU as part of a major amendment.
- Analyzed time frames out to a million years, including the impacts from future climate changes.
- Demonstrated compliance with the dose limits for protecting the public and the intruder.





# Conclusions

- The industry has matured considerably over the past 40 years.
- WCS authorized to dispose of large quantities of DU complying with regulations more stringent than the three-tiered approach.
- A modern facility that is well sited, with defense-in-depth engineered barriers is suitable for isolating long-lived radionuclides well into the future.
- Agreement States and local communities willing to host a disposal facility may prefer maintaining existing regulations that may be more stringent than those under consideration by the NRC.



# NRC Panel Discussion on Part 61 Proposed Rule

June 25, 2015

Perry D. Robinson  
General Counsel  
URENCO-USA ("UUSA")



# UUSA's Stake in the Rulemaking



- As the only commercial enrichment facility in US, UUSA has a substantial interest and stake in Part 61 rulemaking
  - Key driver of rulemaking - disposal of large quantities of depleted uranium ("DU") – first arose in UUSA initial licensing hearing
  - Increased requirements resulting from rulemaking will have a direct adverse impact on low level radioactive waste ("LLRW") generators, such as UUSA (e.g., disposal costs and operational changes)
  - Financial impacts can have a concomitant negative effect on long-term US domestic energy security
- NRC should perform an adequate regulatory analysis of the *enhanced* rulemaking impacts on the fuel cycle industry



# Dose "Minimization Analysis" Discussion



- Sections 61.41 & 61.42 introduce a new continuing dose "minimization analysis" for the public and inadvertent intruder by requiring doses to be below 500 mRem or "at a level that is supported as reasonably achievable based on technological and economic considerations"
- The new requirements raise concern for several reasons:
  - Lack of regulatory and technical support for the new standard
  - Legal precedent on similar standards indicates they can create considerable uncertainty for the regulated community
  - Although the standard is based, in part, on the as low as reasonably achievable ("ALARA") standard, the new standard does not include the type of objectivity the ALARA standard provides

- NRC's delay in considering the waste classification issue along with the other Part 61 requirements constitutes "piece-meal" regulation
  - Courts have discouraged agencies from a "one step at a time" regulatory process
  - NRC has not articulated a clear basis for its bifurcated approach
  - Both rulemakings have the same key driver – *i.e.*, evaluating the disposal of large quantities of DU
- NRC should reconsider its approach and instead move forward with an integrated rulemaking



- NRC has taken the position that "backfit" does not apply to Part 61 and, thus, did not perform a backfit analysis for the rulemaking
- For several reasons, not performing a backfit analysis should be reconsidered:
  - NRC's position narrowly construes the backfit rule under Part 70 - it does not consider that the new requirements can have significant impacts on LLRW generators who rely on Part 61 disposal facilities
  - Inconsistent with prior NRC rulemakings
  - NRC's published regulatory analysis is "qualitative"
  - Failure to consider impacts on affected segments of the industry is not consistent with agency policy to reduce cumulative effects of regulation ("CER")

# Conclusions



- As discussed, there are still substantive matters that need consideration and/or reconsideration prior to finalization of the Part 61 rulemaking
- Notwithstanding, the Commission and the NRC Staff are to be commended for allowing industry engagement



# HEAL Utah Comments On Part 61 Revisions

Matt Pacenza, Executive Director

[matt@healutah.org](mailto:matt@healutah.org)

801-355-5055



# HEAL Utah

- Nonprofit advocacy organization w/approx. 12,000 supporters
- More than a decade as stakeholder in nuclear waste issues in Utah
- Big nuclear waste campaigns over the years:
  - Advocated for ban on B&C wastes
  - Fought to keep foreign waste out of Utah
  - Sought to limit size of Clive site
  - Worked to keep Depleted Uranium, high level waste out of Utah
- Also work on clean air and clean energy issues



# Part 61 comments

- First, thanks for “hybrid” approach, allowing Utah to maintain ban on B&C wastes in classification tables
- A high priority of Gov. Gary Herbert, staff at Division of Radiation Control
- Do have some concern/confusion about language of “Hybrid waste acceptance approach.”
  - “to allow licensees...to develop site-specific WAC from the results of the technical analyses or from the requirements of the existing LLRW classification system.” (p. 16100 of 3/26/15 FR)
  - So licensee decides which approach? Can licensee sidestep ban choosing technical analyses approach?
  - NRC Staff at public hearings said that in fact state regulator chooses; perhaps rules need clarifying.



# Part 61 Concerns:

## Why was staff over-ruled?

### Compliance period

- **NRC staff originally proposed** a “20,000 year compliance period...” (*May 2011 Preliminary Proposed Rule Language.*)
- **NRC Commissioners overruled staff.** “The proposed rule should be revised to include a regulatory compliance period of 1,000 years.” (*February 2014 guidance to staff.*)

### Intruder Assessment

- **NRC staff originally proposed** “...must assume that an inadvertent intruder occupies the disposal site after closure...” (*May 2011 Preliminary Proposed Rule Language.*)
- **NRC Commissioners overruled staff.** “should be based on intrusion scenarios ...consistent with expected activities in and around the disposal site at the time of site closure.” (*February 2014 guidance to staff.*)



# Overruling Staff Reduces Public Faith in Rulemaking

- Commissioners orders same as industry requests
- **Energy Solutions comments:** “EnergySolutions is of the view that while a compliance period of 10,000 years may be workable, a compliance period of 1,000 years is preferable.” *(June 2011 comments to NRC)*
- **EnergySolutions comments** proposed a standard of “reasonably foreseeable scenarios” for the intruder assessment, not including the assumption that an intruder would occupy a site. *(June 2011 comments to NRC)*



# Concerns with “Site Suitability Analysis” approach

- Utah is undergoing a PA review in its consideration of Depleted Uranium
- We’re the “test case” for how it works
- A PA is a massive, dense technical document – largely beyond ability of public to read, let alone comment on
- Development of PA puts enormous discretion and power in hands of consultants – hired by industry
- Advantage of bright lines of classification tables is it allows elected officials, public to participate in a robust debate
- Move to PA approach will limit public debate and participation. See Texas example.



# Should the NRC classify DU?

## Yes

- Single most important “unique waste” decision Part 61 revisions are addressing is whether Utah and Texas should take DU
- Yet revisions won’t go into effect until after at least one, and most likely both, of those decisions are made
- NRC still has an opportunity to play a role in one of those decisions
- Utah officials – Gov. Gary Herbert, most prominently – are pleading with agency to classify Depleted Uranium before decision is final.
- "I expect the Nuclear Regulatory Commission to follow up on that and make their decision," he added. "Until that happens, I'm not comfortable having depleted uranium in Utah." (4/16/15 *Salt Lake Tribune*.)



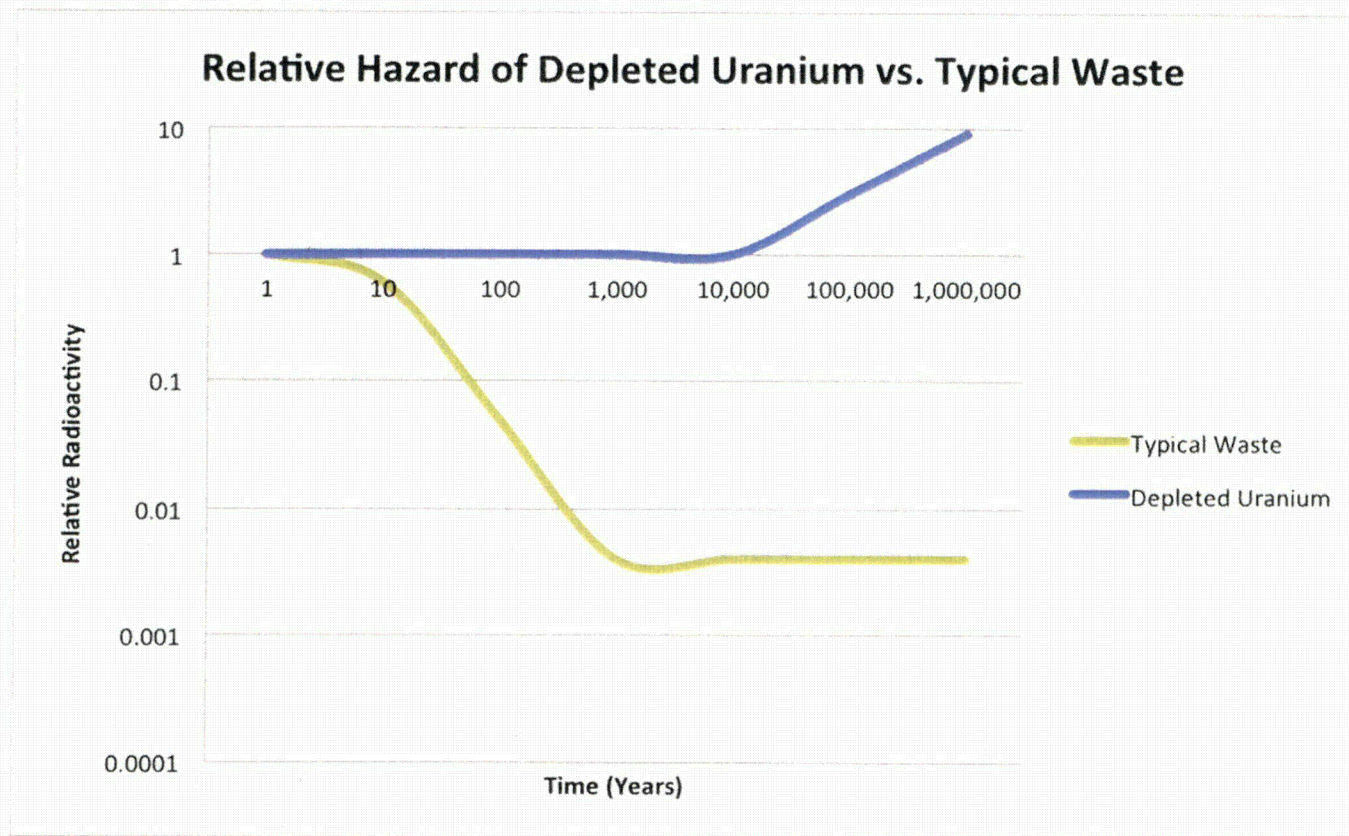


# How Should the NRC Classify DU? Greater than Class A

- While classification is defined by current radiological hazard, duration has always been part of conversation
- Utah's debate on B&C ban was much about comfort with length of hazard
- The very Part 61 revisions document does this too
  - "Class C LLRW may require either greater burial depth or an engineered barrier that will prevent inadvertent intrusion for 500 years." (p. 16085.)
  - "wasteforms or containers should be designed to maintain gross physical properties and identity over 300 years, approximately the time required for Class B waste to decay to innocuous levels." (p. 16085.)
- But, right now, a regulatory loophole could allow waste that *doesn't reach a peak hazard for 2.1 million years* to be treated just like waste which loses 90 percent of its hazard in less than 200.



# Why Re-Classify DU



Source: NRC