



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
ADVISORY COMMITTEE ON NUCLEAR WASTE  
WASHINGTON, DC 20555 - 0001

**R-0261**

May 9, 2007

The Honorable Dale E. Klein  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT: PROPOSED RULEMAKING ON GROUNDWATER PROTECTION AT IN SITU  
LEACH URANIUM RECOVERY FACILITIES**

Dear Chairman Klein:

During its 178th meeting on April 10-12, 2007, the Advisory Committee on Nuclear Waste (the Committee) received a briefing by NRC staff from the Office of Federal and State Materials Safety and Environmental Management Programs (FSME) on the status of a proposed rulemaking on groundwater protection at in situ leach (ISL) uranium recovery facilities. The FSME staff discussed the legislative and regulatory background of ISL, efforts to eliminate dual regulation, staff interactions with the U.S. Environmental Agency (EPA) and the National Mining Association, staff rulemaking strategy, the path forward, and future interactions with the Committee. The staff indicated that the technical basis for the rulemaking is under development. The rulemaking will add a new criterion addressing ISL uranium mining to the existing regulations for conventional uranium mills and mill tailing facilities in 10 CFR Part 40, Appendix A.

**RECOMMENDATIONS**

- The FSME staff should proceed with developing the proposed rule, including codification of the appropriate standards specified by the EPA.
- The rule should provide specific guidance on the three-dimensional location of the point of compliance, groundwater monitoring requirements, methods of demonstrating compliance, and financial surety considerations.
- The rule should establish guidance on measures to reduce the likelihood of contaminant excursions outside the mined zone (the exempted aquifer unit that contains the uranium ore deposit) and the site property (the land that is under control of the licensee), and for remediation outside the mined zone if excursion occurs.
- The rule should be risk-informed and should consider groundwater use, onsite effluent disposal, and decommissioning and license termination requirements.
- The rule should provide requirements for establishing pre-mining background or baseline groundwater quality.

## **DISCUSSION**

The NRC staff is developing a rulemaking to codify regulations and standards to protect groundwater at ISL uranium mining sites. The main concerns are multiplicity of regulations and regulators, protection of uncontaminated groundwater outside the mined zone and restoration of groundwater quality in the mined zone after the mining is terminated. The latter represents a challenge in practice because groundwater restoration involves flushing of the mined zone to remove contaminants, and the resulting asymptotic concentration of contaminants may exceed the concentration desired in the mined ore body. Therefore, full restoration of the mined ore body may not be achievable and an alternate concentration limit (ACL) may be appropriate.

Currently groundwater protection at licensed uranium recovery facilities is regulated pursuant to the Uranium Mill Tailings Radiation Control Act (UMTRCA) and the Atomic Energy Act, as amended. The applicable EPA standards are provided in 40 CFR Part 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," and NRC regulations in 10 CFR Part 40, Appendix A "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content." These regulations require groundwater restoration to pre-mining background levels, or to maximum concentration limits (MCLs), or to alternate concentration limits (ACLs). They are generally applied to uranium mill and mill tailings sites and do not explicitly address ISL facilities.

Guidance for licensing of ISL facilities is currently provided in NUREG-1569, "Standard Review Plan for In Situ Leach Uranium Extraction License Applications," which calls for restoration of groundwater quality within the mined zone and any affected aquifers to pre-operational (baseline) water quality conditions ("Primary Restoration Standards"), or pre-operational class of use ("Secondary Restoration Standards"). If a constituent cannot technically or economically be restored, an applicant must demonstrate that the resulting higher concentration would not degrade adjacent groundwater resources unacceptably or threaten health and safety. In some cases the affected state also regulates groundwater protection at ISL mines. There is a need to codify standards for groundwater protection at ISL sites in NRC regulations.

### **Committee Activities Pertinent to ISL**

In two Staff Requirements Memoranda "COMSECY-05-0064-Fiscal Year 2006 and 2007 Action Plan for the ACNW" (ML060380593), dated February 7, 2006, and "Meeting with Advisory Committee on Nuclear Waste" (ML070170041), dated January 16, 2007, the Commission requested that the Committee advise the Commission as to:

1. The unique waste management, decommissioning, and environmental protection issues related to the licensing of ISL uranium recovery facilities that may arise from a Part 41 rulemaking addressing uranium recovery, and
2. The potential resolution of issues associated with ISL mining and resulting groundwater contamination.

The Commission also stated that the Committee's advice should be appropriately coordinated with the NRC staff so that they are not in conflict with ongoing efforts of the staff. In support of this direction, the Committee appreciates the interaction with the FSME staff on their rulemaking plans and looks forward to commenting on the technical basis for the rule when it is completed.

Sincerely,

**/RA/**

Michael T. Ryan  
Chairman

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Sincerely,

**/RA/**

Michael T. Ryan  
Chairman

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