

WM2012 Conference Panel Report

PANEL SESSION 67 - Management of Uranium Recovery Waste

Co-Chairs: Larry W. Camper, *US NRC*
Rod Grebb, *HER Creative Solutions, LLC*

Panel Reporter: Christopher Grossman, *US NRC*

Panelists:

1. Bill Von Till, *US NRC*
2. John Cash, *UR Energy*
3. Jennifer Opila, *State of Colorado*
4. Mark Pelizza, *Uranium Resources*
5. Suzanne Bohan, *US EPA, Region 8*
6. Anthony Thompson, *Thompson and Pugsley, PLLC*

Larry Camper opened the panel discussion, introduced the panelists, and requested that questions for the panelists be held until after all panelists had spoken.

Bill Von Till was the first panelist to speak and described waste management at uranium recovery facilities from the perspective of the US Nuclear Regulatory Commission. He described Federal regulations for uranium recovery operations including conventional mills, in-situ recovery and heap leach facilities. Bill discussed waste management practices at the three types of uranium recovery facilities. Specifically, conventional mills and heap leach involve management of tailings and long-term care while in-situ recovery sites manage liquid effluent waste and solid waste. He discussed various approaches for managing liquid effluent waste including Class I deep injection wells, evaporation ponds, surface water discharge, land application and Class V injection wells. He continued to discuss NRC's license application review process for waste management methods and the primary documents that guide NRC staff's review. He indicated that NRC staff is developing guidance for Heap Leach facilities. Finally, Bill described emerging issues for waste management at uranium recovery facilities.

John Cash provided an industry perspective of waste management practices at in-situ uranium recovery facilities. He summarized the in-situ process from recovery of uranium from an ore body and the types of waste – liquid and solid – that are produced. He then discussed some of the challenges associated with managing each of these wastes. For liquid wastes, which include liquids from mining bleed, groundwater restoration, plant processes and laboratory effluents, challenges include difficulty permitting Class I wells, difficulty finding reasonably shallow receiving aquifers that are

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below potential drinking water sources, technical challenges of treating before land application, particularly for selenium and radium, and operational and permitting issues with evaporation ponds especially in the northern United States that lacks adequate evaporation all year. For solid wastes, which include operational solid waste such as personnel protective equipment, filters, and contaminated soil and decommissioning solid waste including building material, tankage and piping, challenges include a limited number of economical disposal facilities, the longevity of disposal site access and difficulty characterizing certain wastes such as piping that results in increased costs associated with disposal of more waste than may be necessary.

Mark Pelizza provided perspective on the legacy of uranium mining in the Four Corners region of the United States. First, he summarized the extent of legacy mining waste in the region which includes 500 or more mine sites and the history of the issue. Specifically, he discussed news stories, Congressional hearings and the resulting responses of government agencies that developed five year plans. He indicated that these plans were successful at inventorying the mine sites. Next he discussed the public angst in the region over new mining until old sites are remediated. In this regard, concluded by postulating questions regarding appropriate remediation standards for these legacy mine sites, disposal options for waste from the legacy sites and funding sources for their remediation.

Jennifer Opila discussed a state regulatory agency's perspective on the management of uranium recovery radioactive wastes, in particular the experience of the State of Colorado. She summarized the history of uranium recovery and the inventory of sites in Colorado. She then offered lessons learned from the inspection of Colorado's mill tailings impoundments under the Federal Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978. Next she summarized current and future uranium recovery operations in Colorado. Specifically, she discussed the status of the Pinon Ridge conventional uranium mill.

Suzanne Bohan provided considerations under the National Environmental Policy Act (NEPA) of 1969 for evaluating waste management alternatives for uranium recovery operations. She summarized NEPA requirements and the responsibilities of Federal agencies including the role of the U.S. Environmental Protection Agency (EPA) in reviewing and commenting on environmental impact statements. She highlighted important concerns for EPA's reviews including water quality, groundwater, air quality, wetlands, environmental justice and cumulative impacts. She discussed the range of reasonable alternatives that must be included in environmental impact statements, noted that this can include alternatives outside the capability of the applicant or outside the jurisdiction of the Federal agency and summarized EPA's review of alternatives.

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Specifically, she outlined a process for analyzing alternatives for waste management options under NEPA. She concluded by discussing the EPA's rating system for the adequacy of environmental impact statements.

Anthony Thompson summarized regulatory initiatives for the containment of mill tailings. After describing the regulatory framework and role of both the US Nuclear Regulatory Commission (NRC) and US Department of Energy (DOE) in the regulation and monitoring of mill tailings containment, he provided examples from Exxon's Highland Pit Lake and Western Nuclear's Split Rock sites that have presented challenges to the NRC in demonstrating compliance. The Highland Pit Lake example highlighted the need for a technical and legal basis for inclusion of the Pit Lake in the boundary for long-term surveillance and monitoring that will be transferred to the DOE. The Split Rock example highlighted the durability of institutional controls in a recent NRC decision that Western Nuclear demonstrates good faith to acquire properties or include funds to condemn property in the future as a result groundwater contamination migrating from the site. He also discussed questions regarding various in-situ recovery fluids management, particularly treatment and discharge under a National Pollutant Discharge Elimination System permit. He further discussed that arguments have been made that 40 CFR 61, Subpart W only applies to heap leach facilities during operation, but that a clarification has not been made by the EPA. He concluded by describing efforts by the National Mining Association to gain acceptability for disposal of non-11e.(2) mixed waste in mill tailings impoundments.

Q&A:

- Audience member commented on Multi-Agency Radiation Survey and Site Investigation Manual in regards to **Mark Pelizza's** discussion regarding applicable remediation goals for the legacy mine sites in the Four Corners region of the United States. The audience member indicated the manual is currently being revised.
- An audience member asked a question regarding timeline for Heap Leach guidance document from the NRC. **Bill Von Till** responded that it was in concurrence and awaiting comments from the Agreement States. He estimated it would be released for public comment in approximately a couple of months.
- An audience member asked a question regarding the level of contamination permitted for Class V injection wells. **John Cash** responded that liquid waste disposed in Class V wells must almost meet the drinking water standards in order

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to dispose in aquifers shallower than is typical of Class I wells which are typically thousands of feet deep. He indicated his company is in discussion with the EPA.

- An audience member asked when many of the questions **Mark Pelizza** raised regarding legacy mines in the Four Corners region of the United States would be answered. He responded that it wasn't clear when or how they'll be answered. He described efforts to remediate the General Electric Church Rock site as tough to meet for many of the legacy mine sites. He suggested on-site burial can be done safely, though it is not NRC's vision to have multiple, dispersed sites. He postulated whether there should be a smaller number of regional sites to consolidate the waste from the legacy mines. He also indicated it would likely require legislative action to appropriate funds for the remediation. He cited tailings management as a model, but indicated political will is still needed. He then cautioned that a remediation goal needs to be established first so that the level of funding can be determined.
- An audience member commented that international approaches seem like good models and inquired whether there was any effort to apply them in the case of the legacy mine sites described by **Mark Pelizza**. He indicated that the US seems to set up more stringent standards than the international approaches inquired about.
- A member of the audience asked whether licenses were required to market nuclear fuel. **Anthony Thompson** indicated that licenses are required for the various stages of the nuclear fuel cycle from mining to fuel fabrication including exporting to send fuel abroad.
- A member of the audience asked whether DOE programs (e.g., DOE stockpile of depleted uranium; conversion) are currently impacting the industry. **Anthony Thompson** indicated that DOE programs are not anticipated to have a significant impact on the industry as there are currently indications of an approximately 80 million pound shortfall of uranium production worldwide. He also indicated that in the near future, DOE will begin winding down the down-blending of Russian material.

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