

# FEASIBLE STRATEGIES FOR RECLAIMING <sup>226</sup>RA-CONTAMINATED SOILS FROM ISR U MINE SPILLS<sup>1</sup>

L. Cox<sup>2</sup> and P. Stahl

**Abstract:** Uranium mining is controversial in the U.S. Consideration of methods for remediating contaminated soils is warranted for economic, environmental, and public relations reasons. While U is removed in the mining process, radium (Ra) contamination is of concern when leaks or spills occur. Commonly, contaminated soils are removed and transported off-site for disposal at Nuclear Regulatory Commission (NRC)-approved facilities. This can be expensive and involves added risk of transport of radioactive material along public highways. Having plans in place for otherwise dealing with soils in the event of contamination would be beneficial to industry from economic, regulatory and public relations standpoints.

An extensive literature review was conducted of physical, chemical and biological methods of remediating soils containing radionuclides, with particular attention to <sup>226</sup>Ra, to determine strategies that may be feasible for use on site in the event of an ISR U mine surface spill. This was followed by soil sampling on U mine sites where previous spills had occurred, with samples taken at 2 in. and 6 in. to determine soil texture, pH, <sup>226</sup>Ra content, total and exchangeable Ca content and CEC at both depths. Results were used to develop a flow chart describing strategies that may prove to be practically and economically feasible, including whether a lesser depth of soil might be removed if transport and disposal are the chosen method of dealing with a spill.

Strategy feasibilities were analyzed in relation to soil and vegetation characteristics typical of Wyoming U mine lands, so that operators will have access to this information when deciding the best course of action for handling radionuclide-contaminated soils.

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<sup>2</sup> Lisa Cox, MS, was a graduate student in Soil Science, Reclamation and Restoration Ecology, University of Wyoming, Dept. of Renewable Resources 3354, 1000 E University Ave., Laramie, WY 82071 .Peter Stahl, PhD, is a Professor in the Department of Renewable Resources, University of Wyoming, and is Director of the Wyoming Reclamation and Restoration Center.