December 29, 2006

MEMORANDUM TO: Charles L. Miller, Director
Office of Federal and State Materials
and Environment Management

FROM: Brian W. Sheron, Director ***/RA/ J. Wiggins for***
Office of Nuclear Regulatory Research

SUBJECT: TRANSMITTAL OF PNNL LETTER REPORT ON "PERFORMANCE INDICATORS FOR URANIUM BIOREMEDIATION IN THE SUBSURFACE: BASIS AND ASSESSMENT"

I am forwarding for your information and use the enclosed technical letter report from Pacific Northwest National Laboratory entitled "Performance Indicators for Uranium Bioremediation in the Subsurface: Basis and Assessment." This report addresses technical needs identified by your staff involved in evaluating decommissioning activities at the Cimarron Site. In anticipation of the licensee's selection of in-situ bioremediation to stabilize uranium contaminant plumes at the Cimarron Site, technical staff from the Office of Nuclear Regulatory Research (RES) jointly developed with your staff a Statement of Work (SOW) to provide the technical bases for assessing the efficacy of bioremediation. This report identifies and recommends the performance indicators to be monitored and analyzed to demonstrate both short- and long-term compliance of decommissioning criteria using the proposed remediation strategy.

Of particular significance is the guidance provided in Table 2 which lists prioritized information and monitoring parameters for assessing bioremediation of uranium in the subsurface. This listing is categorized into: (1) uranium distribution, magnitude, form and mobility; (2) hydrologic and geologic site information; (3) geochemical and microbiological monitoring parameters; (4) desirable monitoring parameters; (5) optional monitoring parameters; and (6) temporal dimension of monitoring regime. This information is correlated to a flow chart of recommended steps in implementing a remediation strategy: (1) characterization prerequisites; (2) conceptual model of future uranium behavior; (3) uranium bioremediation bench-scale studies; (4) uranium bioremediation conceptual model/strategy; (5) uranium bioremediation pilot-scale studies; and (6) full-scale field deployment. This detailed information is supported by insights and lessons learned from laboratory and field studies at the Old Rifle UMTRA site, and associated DOE-funded field studies to test bioremediation methods and to monitor their effectiveness. The letter report provides considerable practical discussion of performance issues and indicators, and identifies an extensive bibliography of supporting technical papers and reports on in-situ bioremediation.

CONTACT: Thomas J. Nicholson, RES/DFERR
301-415-6268

Tom Nicholson, Chair of the Technical Advisory Group (TAG) on Ground-Water and Performance Monitoring has distributed electronic copies of enclosed report to the TAG members which includes some of your staff. I would also like to acknowledge the contributions of your staff, particularly Jon Peckenpaugh, to this short-term research effort. In consultation with Ken Kalman, FSME Project Manager for the Cimarron site, the TAG plans to use the guidance in this report to prepare a licensing review plan for the in-situ bioremediation plan proposed for the Cimarron site (December 2006).

RES has established an on-line quality survey that User Offices can use to evaluate the usefulness of RES products and services. An e-mail containing the link to this short survey and the requested due date will be sent directly to the responsible supervisors or managers most closely associated with this Letter Report.

Enclosure:
As stated

cc: K. Kalman, FSME
J. Peckenpaugh, FSME
R. Tadessa, FSME
C. Craig, FSME

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