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April 30, 2003

Mr. Tom Pauling
U.S. Department of Energy
Weldon Spring Site Remedial Action Project
7295 Highway 94 South
St. Charles, MO 63304

Dear Mr. Pauling:

Per your request, I have attached a brief discussion summarizing the residual risk status for the various areas comprising the Quarry Residuals Operable Unit.

Please call me if you have any questions.

Sincerely,

Mary Picel
Project Manager

Attachment

cc:
P. Thompson, DOE
B. Cato, PMC
SY Chen, ANL

An Evaluation of the Residual Risk Status for the Quarry Residuals Operable Unit

This attachment is intended to provide a summary of the residual risk status at the various areas that comprise the Quarry Residuals Operable Unit. These areas are : (1) the Femme Osage Slough (including the Creeks), (2) the Quarry Proper (cracks/fissures and soils), and (3) groundwater north of the slough. These areas were addressed in the *Baseline Risk Assessment Report* that was issued in 1997 that supported the *Record of Decision* for the Quarry Residuals Operable Unit. Groundwater south of the slough was also evaluated in the BRA and found to be within the acceptable risk range. Soil data collected post-BRA from the surrounding area outside of the quarry are also evaluated for both the recreational and hypothetical resident scenarios.

The risk estimates presented in the BRA for sediment and surface water at the Femme Osage Slough and creeks indicated that concentrations of radiological and chemical constituents of concern were within the risk range and below a hazard index of 1 for the recreational visitor scenario. The exposure point concentrations reported in the BRA were then used to estimate risk for a hypothetical resident scenario; the results indicate that the concentrations are also at or within the acceptable risk range for the resident scenario and below a hazard index of 1.

For groundwater north of the slough, current uranium concentrations were compared to those used in the calculations for the BRA. Uranium concentrations have not varied much from the concentrations reported in the BRA; therefore, the estimates presented in the BRA are still representative of the current conditions in groundwater north of the slough. That is, potential risk is greater than the acceptable risk range and greater than a hazard index of 1 for the resident scenario.

Potential risk from the quarry proper was also estimated in the BRA for the cracks and fissures and for soil (within the quarry proper). The estimates presented in the BRA indicated that the potential risks from these areas are within the acceptable risk range and below a hazard index of 1 for the recreational visitor scenario. Calculations for a resident scenario using information from the BRA for these locations within the quarry proper are not performed because restoration activities render the areas sampled and any residual concentrations inaccessible for potential exposure. Soil data collected post-BRA from the surrounding area of the quarry (including those from the well field) indicate that concentrations are in the acceptable risk range and a hazard index below 1 for both the recreational visitor and resident scenarios. Table 1 presents a summary of the results presented in the BRA and the evaluation for post-BRA conditions at the various areas comprising the Quarry Residuals Operable Unit.

TABLE 1 Summary of Risk Results for the Quarry Residuals Operable Unit

	BRA			Post-BRA[a]		
	Scenario	Result		Scenario	Result	
		Rad	Chem		Rad	Chem
Femme Osage Slough[b]						
Sediment	Recreational Visitor	Below Risk Range (3×10^{-8})	Within Risk Range/<HI of 1 (2×10^{-7}/<0.006)	Resident	Within Risk Range (6×10^{-5})	Within Risk Range/<HI of 1 (1×10^{-5}/HI<1)
Surface Water	Recreational Visitor	Below Risk Range (3×10^{-7})	Within Risk Range/<HI of 1 (9×10^{-7}/<0.006)	Resident	At Upper End of Risk Range (at 10^{-4})	Within Risk Range/<HI of 1 (5×10^{-5}/HI<1)
Groundwater North of Slough						
	Resident	Greater than Risk Range (at 10^{-3})	Within Risk Range/greater than hazard index of 1 (at 10^{-4} or lower/<89)	Resident	—[c]	—

TABLE 1 (contd)

	BRA			Post-BRA[a]		
	Scenario	Result		Scenario		
		Rad	Chem		Rad	Chem
Quarry Proper						
Cracks and Fissures	Recreational Visitor	Within Risk Range (3×10^{-5})	Within Risk Range/<HI of 1 (6×10^{-8}/<0.008)	Resident	NA[d]	NA
Soils	Recreational Visitor	Within Risk Range (1×10^{-5})	Within Risk Range/<HI of 1 (1×10^{-7}/<0.004)	Resident	Within Risk Range (8×10^{-5})	Within Risk Range/<HI of 1
Soils Outside Quarry	—[c]	—	—	Recreational Visitor	Within Risk Range (at 10^{-6})	Below Risk Range/<HI of 1 (1×10^{-11}/<0.004)
	—	—	—	Resident	Comparable to Background (at 10^{-4})	Below Risk Range/<HI of 1 (5×10^{-10}/<0.07)

[a] Calculations are performed for a hypothetical resident scenario using data presented in the BRA (the BRA presents calculations for a recreational visitor scenario, consistent with current and foreseeable future land use. Soil data outside the quarry were collected post-BRA and are evaluated for both the recreational visitor and hypothetical resident scenarios for this attachment.

[b] Includes creeks.

[c] Not calculated for Post-BRA concentrations; concentrations are generally same as those evaluated for the BRA.

[d] NA=not applicable; quarry restoration has been completed and cracks and fissures are not potential exposure routes.

[e] Not evaluated in the BRA.