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RE: BASELINE REMEDIAL STRATEGY REPORT - (THIS LETTER WAS RECEIVED UNDATED, COMMENTS ARE FOR THE BASELINE REMEDIAL STRATEGY REPORT FOR AQUIFER RESTORATION)

USEPA DOE-FEMP
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COMMENTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

K-0533

6446.6

REPLY TO THE ATTENTION OF: SRF-5J

Mr. Johnny W. Reising
United States Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

RE: Baseline Remedial Strategy Report

Dear Mr. Reising:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the United States Department of Energy's (U.S. DOE) baseline remedial strategy report for aquifer restoration.

The report is intended to serve as the technical basis for the detailed design of the groundwater remedy, and summarizes the results of enhancement modeling simulations presented in the Operable Unit 5 feasibility study report.

U.S. EPA has several comments on the report that must be addressed and/or require further clarification.

Therefore, U.S. EPA disapproves the baseline remedial strategy report pending incorporation of adequate responses to the attached comments. U.S. DOE must submit a revised report and responses to comments within thirty (30) days receipt of this letter.

(Jantke (rj)
Partial
action response
to dee-1434-96
(10057)

Please contact me at (312) 886-0992 if you have any questions regarding this matter.

Sincerely,

James A. Saric
Remedial Project Manager
Federal Facilities Section
SFD Remedial Response Branch #2

Enclosure

cc: Tom Schneider, OEPA-SWDO
Jack Baublitz, U.S. DOE-HDQ
John Bradburne, FERMCO
Charles Little, FERMCO
Terry Hagen, FERMCO
Tom Walsh, FERMCO

TECHNICAL REVIEW COMMENTS ON THE "BASELINE REMEDIAL STRATEGY REPORT REMEDIAL DESIGN FOR AQUIFER RESTORATION (TASK 1)"

GENERAL COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Not applicable (NA) Page #: NA Line #: NA
Original General Comment #:1
Comment: The report states in several places that additional treatment capacity above the volume described in the Operable Unit (OU) 5 record of decision (ROD) is not required. However no language in the ROD precludes additional treatment capacity above the 2,350 gallons per minute specified in the ROD. The report should be amended to not preclude the option for additional treatment capacity.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #:2
Comment: The report proposes natural attenuation of contaminants in some areas of the Great Miami Aquifer (GMA). Natural attenuation is an acceptable aquifer restoration option. However, it appears that attenuation in the GMA would be enhanced through dilution. Attenuation through dilution may not meet the intent of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) or the OU 5 ROD. The effect of natural attenuation without groundwater injection or a change in the desorption coefficient (K_d) should be discussed in the report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #:3
Comment: Section 4.3.1 of the report presents a comparison of the relative costs in terms of "cost units" for each of the four aquifer restoration scenarios. This type of cost comparison is typically conducted by completing a present worth analysis. A present worth analysis should be completed and presented in this report. The analysis should compare the two end-member components of the baseline groundwater remediation scenario; the minimum time which assume a change in K_d (from 7.8 to 17.8) and the maximum time that assumes no change in K_d (1.7 for the entire period) and the 27-year restoration scenario presented in the OU 5 feasibility study (FS) report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #:4
Comment: Section 5.1.2 on Page 5-7 states that unless the property owner agrees to the installation of wells 2N and KN, DOE will not pursue the matter further and will not install the wells. This issue is discussed in greater detail in Section 5.2, where the results of additional modeling studies are presented. These results indicate that natural attenuation is as effective as active pump-and-treat methods. However, natural attenuation relies on two major actions: (1) reinjection of groundwater at the upgradient edge of the plume, which may have a significant impact on contaminant attenuation, and (2) the change of the K_d value by a factor of 10, which enhances contaminant attenuation. Because the effect of groundwater injection on enhancing contaminant attenuation is unknown and the actual "apparent" K_d value is also uncertain, the models should simulate Scenario II with no injection and no change in the K_d value to quantify the impacts both actions have on the proposed path. The results of the new modeling scenarios should be presented in the revised report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #:5
Comment: Appendix A discusses the appropriate values for adsorption and desorption coefficients for uranium in aquifer soils underlying the facility. However, the report does not sufficiently explain the uncertainties associated with the specific values selected. The report should explain the uncertainties associated with selection of a specific value for each of these coefficients. For a site as large as FEMP, sorption coefficients are expected to vary widely throughout the site. One report states that sorption coefficients for uranium in GMA soils near the water table range from 17 to 273 liters per kilogram (L/Kg) (Sidle and Lee 1996). Because these coefficient values are uncertain, estimation of the time needed to cleanup the aquifer is expected to be difficult and uncertain.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #:6
Comment: The primary objective of the baseline scenario is aquifer restoration. As discussed in the general and specific comments here, the baseline scenario has significant uncertainty associated with it and may actually not restore the aquifer any faster than the feasibility study scenario. Containment should be added to the 10-year scenario objectives, which would involve installation of

wells at the downgradient edges of the plumes where they will not interfere with source area remediation and then installation of wells in the source areas when appropriate. Duplication of effort would apparently not occur because most of the wells proposed under the feasibility study scenario (positioned at the downgradient edge of the plumes) are part of the 10-year scenario. The objectives and baseline scenario should be revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #:7
Comment: The extraction/injection schedule for the baseline remedial strategy presented in Table 5-1 appears to indicate a different schedule than the schedule presented in Table 3-1 of the "Remedial Design Work Plan for Remedial Actions At Operable Unit 5" (RDWP). Although Table 3-1 in the RDWP presents a schedule for remedial design deliverables, the timeframe for well installation and commencement of extraction/injection activities as presented in Table 5-1 of this report appears later in the 10-year baseline scenario than anticipated. For example, the RDWP indicates that the Waste Storage Area Extraction Module Design (Task 7) will be submitted as a prefinal package on November 30, 2001. However, Table 5-1 in this report indicates that pumping these wells will not begin until 2004 to 2006, resulting in a 3- to 5-year lag time between finalization of design and commencement of system operation. DOE should submit a schedule that incorporates all milestones that are consistant with both the RDWP and the baseline remedial strategy report.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.4 Page #: 1-8 Line #: 36
Original Specific Comment #:1
Comment: The text states that if hydraulic impacts are as desired but no additional treatment capacity is available, then the only viable option is to extend cleanup times. Nothing in the ROD precludes adding additional treatment capacity to the system to achieve the desired cleanup time. The report should be revised to state that extending cleanup times or adding additional treatment capacity are both viable options under this situation.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.1.4 Page #: 3-4 Line #: 10
Original Specific Comment #:2
Comment: The report states that South Plume Removal Action wells will be handled as a single unit and that the extracted groundwater would be treated or discharged depending on the combined concentration occurring in the South Plume force main. Because only two of the five South Plume Removal Action wells are extracting contaminated water, the resultant concentration in the force main will be diluted; therefore, this approach does not meet the intent of the ROD. The treatment or discharge decision should be based on wellhead concentrations for each well. This approach was agreed upon in the "Project Specific Plan for the Installation of the South Field Extraction System."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2 Page #: 3-6 Line #: 5
Original Specific Comment #:3
Comment: The report states that monitoring data will be evaluated frequently to determine the effectiveness of the system or identify potential problems. The schedule in the Integrated Environmental Monitoring Program (IEMP) does not describe a schedule of sufficient frequency to conduct evaluations. A specific monitoring schedule should be added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.4.3 Page #: 3-10 Line #: 23
Original Specific Comment #:4
Comment: The report states that any cleanup scenario that requires incremental treatment capacity extends beyond the commitment for extended treatment capacity in the ROD. No language in the ROD precludes additional treatment capacity. This sentence and all other sentences that imply that additional treatment is going beyond ROD requirements should be deleted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.4.4 Page #: 3-11 Lines #: 2 through 4
Original Specific Comment #: 5
Comment: The report refers to several studies that indicate that adsorption is not a reversible phenomenon as time increases. Most of the studies referred to were conducted with organic compounds such as polychlorinated biphenyls and polycyclic aromatic hydrocarbons. The report refers to isotherm studies it has conducted with GMA solids in Lines 29 and 30. It is not clear whether these studies indicate different characteristics for adsorption and desorption for uranium. If so, these studies should be referenced in the discussion. If the studies did not indicate different coefficient values

for adsorption and desorption, then further justification for assuming that adsorption and desorption coefficients are different should be provided.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.4.4 Page #: 3-11 Lines #: 10 and 11
Original Specific Comment #:6
Comment: The statement that groundwater concentration will stabilize below the contaminant's designated cleanup level requires further clarification. Further information to justify this statement should be provided in the report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.2 Page #: 4-2 Line #: 29
Original Specific Comment #:7
Comment: The report states that South Plume Removal Action wells will be handled as a single unit and that the extracted groundwater would be treated or discharged depending on the combined concentration occurring in the South Plume force main. Because only two of the five South Plume Removal Action wells are extracting contaminated water, the resultant concentration in the force main will be diluted; therefore, this approach does not meet the intent of the ROD. The decision to treat or discharge should be based on the well head. This approach was agreed upon in the "Project Specific Plan for the Installation of the South Field Extraction System," dated May 1995.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.2.1 Page #: 4-4 Line #: 20
Original Specific Comment #:8
Comment: The report states that it is expected that the feasibility study scenario restoration time will increase to over 30 years if the transition K_d value is employed as it is in the baseline scenario. It is apparent from this statement that this possibility was not modeled. In addition, it is not clear why employing the apparent K_d value would reduce the remediation time for all scenarios other than the feasibility study scenario. Additional information to support these assertions should be included in the report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.2.2 Page #: 4-29 Line #: 30
Original Specific Comment #:9
Comment: The report states that if the treatment capacity and/or efficiency are significantly lower than expected, the extraction rate may need to be reduced in order to maintain the required discharge concentration. The report should acknowledge that additional treatment capacity is also a

viable option and is preferred to increasing aquifer restoration times.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.2.2 Page #: 4-30 Line #: 3
Original Specific Comment #:10
Comment: The report states that the chance of additional treatment capacity resulting from the addition of mobile treatment modules is very low. No language in the ROD precludes additional treatment. The report should include a discussion explaining why the chance of additional treatment capacity is very low.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.2.1.2 Page #: 5-10 Line #: 10
Original Specific Comment #:11
Comment: The report states that wells 1 and 3N may be tied into the existing South Plume Removal Action pipeline. This approach is acceptable as long as extracted groundwater from each individual well can be sent for either treatment or discharge and is monitored at the well head. The report should clarify this matter.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.4.2 Page #: 5-32 Line #: 6
Original Specific Comment #:12
Comment: The report states that the combined uranium concentration in the extracted South Plume groundwater is less than 20 parts per billion (ppb) and that this groundwater does not require treatment. However, the ROD requires that an evaluation be made at each well to determine whether extracted groundwater should be treated or discharged. The report should propose a course of action that satisfies the intent of the ROD.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.2.1 Page #: 6-3 Line #: 1
Original Specific Comment #:13
Comment: The report states that a fundamental objective is to use a "learn as you go" principal. Although this approach is evident in the sequencing of the modules of the 10-year scenario, adequate learning of aquifer response and of contaminant response to injection and extraction until about year six, which does not allow sufficient time to for DOE to make adjustments to meet the 10-year predicted restoration timeframe.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.2.1 Page #: 6-3 Line #: 25
Original Specific Comment #:14
Comment: The report states that fundamental objective of restoring the off-property portion of the groundwater plume is FEMP's highest priority. This approach is not evident considering that the baseline scenario does not include wells 2N and KN and that wells 1 and 3N are not scheduled to be operating until 1999 to 2003. The report should be revised so that the implementation schedule matches the stated objectives.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.2.1 Page #: 6-3 Line #: 34
Original Specific Comment #:15
Comment: The report states that the projected dates are DOE's best estimate for when design submittals will be necessary. The dates provided give year ranges such as 1999 through 2003. These dates are not sufficient to constitute a schedule considering that the report proposes that the enforceable construction schedules will be submitted with the prefinal design package. A more definite remedial design schedule should be presented in this report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.2.1 Page #: 6-4 Line #: 1
Original Specific Comment #:16
Comment: The report proposes an "umbrella" remedial action work plan that will provide the enforceable construction schedule for the first module to be constructed. The report also states that the enforceable construction schedules will be established in subsequent remedial action work plan addenda. This approach provides too much flexibility and lack of enforceability. A schedule with firm milestones for each module should be included in the report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.2.3 Page #: 6-4 Line #: 31
Original Specific Comment #:17
Comment: The report states that it is important to emphasize that the recommended path forward does not specify an enforceable restoration timeframe to be achieved at all cost. This statement is reasonable; however, enforceable construction schedules should be proposed.