RESPONSES TO OEPA COMMENTS ON THE U.S. DOE RESPONSES TO OEPA COMMENTS ON THE DRAFT SOUTH PLUME REMOVAL ACTION SYSTEM EVALUATION REPORT FOR JANUARY 1-JUNE 30, 1997

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

MARCH 1998

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

1358

Department of Energy

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MAR 26 1998

DOE-0629-98

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF: 1) THE INTEGRATED ENVIRONMENTAL MONITORING STATUS REPORT FOR FOURTH QUARTER 1997 (MARCH 1998), 2) RESPONSE TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE DECEMBER 1997 INTEGRATED ENVIRONMENTAL MONITORING STATUS REPORT FOR THIRD QUARTER 1997, AND 3) RESPONSE TO THE SECOND ITERATION OF OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE DRAFT SOUTH PLUME REMOVAL ACTION SYSTEM EVALUATION REPORT FOR JANUARY 1 THROUGH JUNE 30, 1997

This letter serves to transmit the subject documents. The report has been prepared to meet the quarterly reporting obligation defined in the Integrated Environmental Monitoring Plan (IEMP) for the Fernald Environmental Management Project (FEMP). As agreed to with the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA), agency comments on the IEMP Quarterly Status Report for Third Quarter 1997 have been addressed through the enclosed comment response document rather than through a revision of the report. Where appropriate, actions resulting from comments on the previous IEMP report have been incorporated in the current report.

Included in this transmittal are Department of Energy (DOE) responses to address the second iteration of OEPA comments on the Draft South Plume Removal Action System Evaluation Report for January 1 through June 30, 1997, which was submitted previously in September 1997. This semi-annual report is being discontinued because the information is now included as part of the IEMP reporting activity.

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To assist in your review, the raw data used in developing the report are submitted in electronic format. The analytical data associated with this report are provided on three disks: One disk contains groundwater data; one disk contains surface water data; and the final disk contains air data. Each disk contains a WordPerfect file which identifies the files on each disk, and how the data in the tables of the IEMP status report can be generated.

We look forward to meeting with you to discuss this report and the upcoming IEMP deliverables. Should you have any questions regarding this submittal, please contact Kathleen Nickel at (513) 648-3166.

Sincerely,

Glenn Griffith

for Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Nickel

Enclosures: As Stated

cc w/encs (to include disks):

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RESPONSES TO OEPA COMMENTS ON THE U.S. DOE RESPONSES TO OEPA COMMENTS ON THE DRAFT SOUTH PLUME REMOVAL ACTION SYSTEM EVALUATION REPORT FOR JANUARY 1-JUNE 30, 1997

3. Commenting Organization: OEPA Commentor: HSI-GeoTrans, Inc.
Section # : 1.0 Operational Summary Pg. #: 1-1 Line # 29-30 Code: M
Original Comment #: 1

Comment: The text indicates that the pumping rate at RW-3 was not increased while RW-4 was being rehabilitated because of its proximity to the Paddy Run Road Site and potential adverse impacts on PRRS contaminants. However, while RW-4 was inoperative, the average South Plume System extraction rate was only 1000 gpm. In the Executive Summary, page ES-2, Lines 25-26, it was stated that "the total (uranium) plume remains within the capture zone created by the current recovery system when it operates at the optimum 1400 gpm pumping rate." It is assumed that the potential impact of not increasing the rate of pumping at RW-3 would be to prevent full uranium plume capture and allow dissolved uranium to co-mingle with PRRS contaminants. For this reason, the rate of pumping of RW-3 should be increased or an additional well should be added to the system to maintain overall optimum system rates while RW-4 is being rehabilitated or serviced. Previous FEMP documents have recognized this. For example, the "Operations and Maintenance Master Plan for the Aquifer Restoration and Wastewater Treatment Project--Draft Final, September, 1997, Appendix A, Section 3, Page 7, Lines 11-14 states, " The South Plume Recovery Well field System, on the other hand, runs continuously and has no spare wells to compensate for wells taken out of service for maintenance. In fact, when a well goes down for maintenance, the remaining wells must increase their flow to continue the scheduled capture of the plume."

Response: DOE does not believe that pumping rates on RW-3 should be increased or that an additional well is needed to maintain system pumping rates when individual wells are down for routine maintenance. The pumping rate on RW-3 was not increased while RW-4 was out of service because past experience has shown that increasing the pumping rates in RW-1, RW-2 or RW-3 above the optimum pumping rates of 300 gpm for RW-1 and RW-2 and 400 gpm for RW-3 tends to change the flow directions south of the recovery system which causes an increase in arsenic concentrations in some PRRS monitoring wells immediately south of the recovery system.

As presented in the South Plume Groundwater Recovery System Design, Monitoring, and Evaluation Program Plan (DOE April 1993), the South Plume pumping system was designed to meet two specific, mutually exclusive objectives:

"1) The groundwater recovery wells need to be pumped at a sufficient rate to create a hydraulic barrier along a line running approximately perpendicular to the longitudinal axis of the plume in the shallow portion of the Great Miami Aquifer, creating an elongated groundwater trough..."

"2) The magnitude of the hydraulic trough needs to be minimized while still meeting Objective 1 in order to minimize the impact on the overall hydrogeologic system. If extensive capture zones are created, then the PRRS plumes may be pulled toward the recovery wells. Also, minimal disturbance to the local hydrologic system is desired to...not significantly deflect the PRRS contaminant flow trajectory."

"To meet the multiple objectives requires that the system balance the two opposing factors of creating sufficient drawdown to prevent migration around, between, or

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beneath the recovery wells and of minimizing drawdown to prevent gradient changes over a large area. Therefore, the system must be evaluated in relation to balancing these objectives."

As indicated in Figure 4-14 of the April 1997 DMEPP System Evaluation Report, a modeled capture zone for the 1000 gpm pumping scenario shows no breakthrough between the recovery wells when Recovery Well 3927 (RW-4) is off line.

Furthermore, with total uranium concentrations averaging 10.8 μg/L in Recovery Well 3926 (RW-3) and 1.2 μg/L in Recovery Well 3927 (RW-4), no uranium concentrations above the 20 μg/L final remediation level (FRL) would have moved through the eastern end of the line of recovery wells while RW-4 was off line.

Figure 4-1 of the current DMEPP report shows the 20 μg/L concentration isopleth approximately 300 feet up gradient of Recovery Well 3927 (RW-4). Therefore, the well would have to have been out of service for five months or more for the 20 μg/L isopleth to move the 300 feet to the well, given the calculated rate of plume movement discussed on Page 4-5, Lines 13-15.

Action: None necessary

Commenting Organization: OEPA *Commentor: T. Schneider*
Comment on Response #3:

DOE does not believe pumping rates should be increased above their optimal pumping rates (300 gpm for RW-1 and RW-2, and 400 gpm for RW-3 and RW-4) when individual wells are down for routine service. This is counter to the extraction strategies described in the Operations and Maintenance Master Plan for the Aquifer Restoration Wastewater Treatment Project--Final, November 1997, Figure 5-7. This figure describes operational guidelines for well field abnormalities including South Plume well outages. In particular, for conditions where wells are not operating for periods of one week or greater, Figure 5-7 indicates that other wells within the South Plume extraction network must be increased to compensate.

According to the Draft South Plume Removal Action System Evaluation Report, RW-4 was inoperative for a period greater than one week from November 27, 1996 through January 8, 1997. Other South Plume extraction wells also were also non-operational for periods greater than one week, e.g., RW-2 and RW-3 were both non-operational for the majority of May 1997.

DOE has offered three reasons why it was not necessary to increase pumping at other South Plume extractions wells:

Increased pumping at certain extraction wells could adversely affect the PRRS contaminant plume trajectory.

If the conditions of the well maintenance in April 1997 are considered, groundwater modeling indicates that when 1000 gpm of groundwater is extracted, plume capture is still maintained.

Concentrations of groundwater in the vicinity of RW-4 were anticipated to be below the 20 μg/L concentration limit.

For the conditions described above, DOE has made persuasive arguments whey the Operations and Maintenance Master Plan was not followed. However, it has not indicated that any refinement of the guidance is necessary. To best address these in consistences, a revised guidance should be presented that specifies operation that is consistent with DOE's aquifer restoration performance commitments. The need for such revision is especially critical as the site groundwater remediation system becomes increasingly complex.

Response to comment on Response #3:

The comment points out instances where guidance in the Operations Maintenance Master Plan for the Aquifer Restoration and Wastewater Treatment Project (DOE, November 1997) (O&M Plan) was not followed by DOE. Specifically, the comment identifies well outages in November 27, 1996 through January 8, 1997, and in May 1997 which were not handled according to the guidance presented in the O&M Plan. Since the O&M Plan was not finalized until November 1997 this explains the apparent inconsistencies.

The comment also suggests that an update to the guidance in the O&M Plan is required. Specifically, the strategy presented in Figure 5-7 of the plan does not consider the aquifer remedy objective to avoid adverse impacts to the Paddys Run Road Site plume. DOE agrees with the comment and will revise the plan accordingly.

Action: *Revise Figure 5-7 of the O&M Plan before South Plume Optimization System Start-Up so that guidance reflects the aquifer remedy objective to avoid adverse influences to the Paddys Run Road Site plume.*

5. Commenting Organization: OEPA Commentor: HSI-GeoTrans, Inc.
Section # : 1.0 Operational Summary Pg. #: 1-2 Line # 16 Code: C
Original Comment #: 3

Comment: The operational summary sheets for the four extraction wells provide flow rates on a monthly only basis. To help assess system performance more accurately, average daily flows should be summarized graphically in this report.

Response: DOE acknowledges the comment. Daily pumping flow rates for the South Plume system are measured and recorded. These records are stored at the site and are available for inspection. However, DOE believes sufficient data is available in the report to evaluate the recovery system operation using the monthly average system pumping rates. As explained in the response to Comment #2, DOE will continue to strive to make the results which are reported as clear and concise as possible so that report preparation and review remain as efficient as possible.

Action: None necessary.

Comment on Response #5:

Daily Extraction rate information should be included with the Integrated Environmental Monitoring Status Reports. This should be reported both graphically and in either a tabular appendix or in an electronic file. This would provide the reviewer with a rapid means to adequately evaluate the daily variability in groundwater extraction rates and period of well outages. This information is currently obscured in the report format.

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Response to comment on Response #5:

OEPA has requested that daily extraction rate information be included in the IEMP quarterly status reports. DOE has complied with this request. Daily extraction rate information is provided in the March IEMP quarterly status report and will be included in future IEMP quarterly status reports.

Action: *Already taken as described in the response.*

8. Commenting Organization: OEPA Commentor: HSI-GeoTrans, Inc.
Section #: 3.0 Analytical Data Summary Pg. #: 3-2 Line # 17-25 Code: C
Original Comment #: 6

Comment: The significant upward trend in total uranium at 2551, along with this well's location requires that more activity than just monitoring be performed. Because of the scarcity of wells in this area, additional wells are required to define the western edge of the uranium plume. This is especially important because it appears that most of the mass of the plume is to the west, and there is very little basis for the definition of the western edge of the plume as shown in the total uranium maps provided.

Response: While the statistical trend calculation for Monitoring Well 2551 was Up Significant, an examination of Table 3-1 shows that the Mann-Kendall probability for the trend was 0.044 which is very close to the 0.05 cut off required to distinguish an Up Significant trend from an Up Marginal trend. A look at the graph of total uranium concentration versus time for this well (from Appendix B) confirms that the trend is not a strong trend and reveals that the calculated upward trend may be the result of a seasonal component to the concentrations. Concentrations have trended upward during the first quarter sampling for both 1996 and 1997 but have decreased in subsequent quarters of both years.

Given that the well exhibited a total uranium concentration of 28.0 μg/L during the second quarter sampling round of 1997, and that Monitoring Well 2017, which is also west of Paddys Run and up gradient of Monitoring Well 2551, exhibited a maximum concentration of 3.6 μg/L during the same time, DOE believes the current interpretation of the western edge of the uranium plume is correct and that no additional wells are needed in this area. This conclusion is supported by the fact the concentration gradients along the western edge of the plume as presented in Figure 4-1 are consistent from Monitoring Well 2017 south to Monitoring Well 2551.

Action: None necessary.

Comment on Response #8:

We do not agree with the assertion that the western edge of the 20 μg/L plume is adequately defined. We believe that the plume delineation to the west of MW 2551 is ambiguous. Groundwater elevation contours in Figure 1-13--Groundwater Elevations. Type 2 wells, April 1997 in the draft Integrated Environmental Monitoring Status Report for Third Quarter 1997 suggest that groundwater flow at Monitoring Well 2551 may be to the southwest. We realize that the capture zones in Figure 1-28 of the IEMP third quarter 1997 status report do imply capture in this area, but the ambiguity exists in the measured data, not the modeled interpretation. Monitoring Well 2017 is to the North and does not help to define the plume to the west. DOEs argument that the gradients are from monitoring well 2017 south to Monitoring Well 2551 does not appear germaine to our concerns. The Ohio EPA will continue to evaluate the flows in this vicinity using the data in the IEMP quarterly status reports. If plume expansion or failure to maintain plume capture is occurring, additional actions will be necessary.

Response to comment on Response #8

OEPA does not agree with DOE's assertion in response #8 that the western edge of the 20 µg/L total uranium plume is adequately defined in the area around Monitoring Well 2551 which is immediately west of Paddys Run and south of Willey Road.

In a meeting between DOE/FDF, OEPA, and HSI GeoTrans held on February 23, 1998, DOE/FDF reviewed what is known about how the uranium plume was formed and provided technical justification as to why the plume could not be very far west of Paddys Run in the vicinity of Monitor Well 2551. DOE/FDF agreed to taking flow direction measurements at Well 2551 with the colloidal borescope to assist in determining the need for further evaluation of this area. These measurements at Monitoring Well 2551 will be taken with the next round of borescope measurements if well access is granted by the new land owner.

Action: *As stated in the response.*