

**RESPONSES TO U.S. & OEPA COMMENTS
ON THE DRAFT
INTEGRATED ENVIRONMENTAL MONITORING
STATUS REPORT FOR THIRD QUARTER 1997**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO**

FEBRUARY 1998

**U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE**

**RÉSPONSES TO U.S. EPA COMMENTS
ON THE DRAFT
INTEGRATED ENVIRONMENTAL MONITORING STATUS REPORT
FOR THIRD QUARTER 1997**

General Comments

1. Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: NA Line#: NA Code:

Original General Comment# 1

Comment: The text states that Integrated Environmental Monitoring Plan (IEMP) quarterly reports are intended to be more current than cumulative annual reports so that they can support timely decision-making. To help meet this objective, future quarterly reports should be revised to include a brief, additional section outlining remediation plans for the next two to four quarters. This section should also discuss any operational changes that might affect media and that would therefore require adjustment of the ongoing monitoring program. For instance, startup of a major dirt-moving operation such as the South Field excavation would require consideration of modifications to the monitoring programs for total suspended particulates and radioactive emissions. Another example is the potential modification of the South Plume recovery well system based on the observed efficiencies of the operating recovery wells. Although information on planned activities is available in other documents, its inclusion in future quarterly reports would make these reports more complete and thus would support timely decision-making.

Response: A fundamental objective of the IEMP is to align the environmental monitoring program with the remediation activities anticipated under the accelerated remediation plan. Realizing that the mix and pace of remediation activities would change over the life of the project, the IEMP was developed to primarily focus on the remedial activities forecasted for the forthcoming two years. The two-year IEMP focus limits the uncertainties associated with long-range project planning and provides flexibility to customize monitoring programs to the current mix of remediation activities.

The initial IEMP focused on the remediation activities scheduled for 1997 and 1998. Section 2 of the IEMP outlines the major remediation activities scheduled for this two-year period and includes the activities outlined in the comment above (i.e., excavation activities associated with the Operable Unit 2 waste units and construction and operation of groundwater recovery systems). These activities were considered in the development of the monitoring programs defined in the IEMP and, therefore, their implementation does not require modifications to the current monitoring program design. However, if significant new remediation activities are initiated or changes to the baseline of activities forecasted in the IEMP occur, then the IEMP quarterly status report will document these changing conditions and any proposed adjustments to the ongoing monitoring programs.

As noted in Comment Response #36, DOE will document any correlations identified between significant changes in monitoring data and associated project activities in the IEMP quarterly status reports. However, since the IEMP already provides the baseline of near-term remediation activities which serve as the foundation for the monitoring program design and, as noted by the commentor, information on planned activities is provided in other documents, DOE does not believe that reiterating this information in the IEMP quarterly status reports is necessary.

Action: No action required.

2. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 1.0 Pg.#: NA Line#: NA Code:
Original General Comment# 2

Comment: The current reporting schedule for groundwater monitoring data is such that each future quarterly report will present operational and groundwater flow information for one quarter but the analytical results for the preceding quarter. This segmented reporting is confusing and will interfere with timely decision-making. The U.S. Department of Energy (DOE) should describe in detail why analytical results for a particular quarter cannot be included in the report for that quarter.

Response: The requested detailed description has been provided in the approved final version of the IEMP which states in the last paragraph of Section 3.7.2 that:

“Two questions which will be answered by the quarterly reports cannot be addressed within 60 days of the close of the quarter. Determining the latest geometry of the 20 µg/L total uranium plume, and the effect that the restoration is having on the Paddys Run Road Site plume requires the analysis of a large amount of data derived from monitoring well samples. Reporting of this data requires several steps: analysis, validation, organization, interpretation, summary of interpretation, and finally issuance of a report. Experience at the FEMP shows that the steps required to report large amounts of analytical data takes approximately six months following completion of the data collection. Therefore, it is proposed that the answer to these two questions be delayed one quarter.”

Preliminary data is assessed as it becomes available (2-3 months following sample collection). EPA and OEPA would be notified immediately if any of this preliminary data indicate the need for a decision involving EPA and OEPA ahead of the issuance of the respective IEMP report scheduled to contain the data in question.

Action: In the upcoming revision of the IEMP, add text to clarify what is noted in the last paragraph of the response. Establish quarterly meetings with the EPA and OEPA which correspond with the submittal of the IEMP reports. The purpose for the meetings would be to:

- Clarify the contents of the respective IEMP report
- Highlight important findings contained within the report
- Answer any immediate questions regarding the report content
- Obtain EPA and OEPA input for desired content of future reports.

3. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 1.0 Pg.#: NA Line#: NA Code:
Original General Comment# 3

Comment: This section provides an update on groundwater monitoring results. Section 3.7.2 on Page 3-85 of the IEMP states that DOE will provide the U.S. Environmental Protection Agency (U.S. EPA) with a letter report within 60 days of the close of each quarter to provide figures, tables, maps, and so on reflecting that quarter's groundwater monitoring results. However, U.S. EPA has not received such a report for the third quarter of 1997. DOE should submit these letter reports to U.S. EPA in the future. Each letter report should include all groundwater elevation data, analytical data, and operational information for the quarter involved.

Response: The IEMP Quarterly Status Report for Third Quarter 1997 which was issued by DOE in December 1997 serves as the report mentioned in Section 3.7.2 of the IEMP. The extension of the report submittal date to mid-December was verbally approved by EPA.

The groundwater section of the December 1997 IEMP Quarterly Status Report for Third Quarter 1997 summarized operational data for the third quarter of 1997 and analytical data for the second quarter of 1997. An electronic copy of the data in the December report was transmitted to EPA and OEPA in January 1998.

Action: The IEMP reporting schedule for the remainder of 1998 will be provided to the EPA and OEPA at the IEMP meeting scheduled for April 1, 1998.

4. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 1.3 Pg.#: NA Line#: NA Code:
 Original General Comment# 4

Comment: This section provides an assessment of aquifer restoration progress. Section 3.7.2 on Page 3-85 of the IEMP states that DOE will report the latest geometry of the 20-microgram per liter ($\mu\text{g/L}$) total uranium plume as part of the restoration assessment. However, the geometry of the 20- $\mu\text{g/L}$ total uranium plume during the second quarter of 1997 is not described in the quarterly report. DOE should provide an isoconcentration map showing the total uranium concentrations detected during the quarter in each future quarterly report.

Response: The December 1997 IEMP Quarterly Status Report for Third Quarter 1997 states in the last paragraph on page 1-1 that:

"The operational data and results of groundwater monitoring for the South Plume DMEPP for January 1 through June 30, 1997 were presented in the September 1997 DMEPP report and, as such, are not reported here."

Since the IEMP was not initiated until August 1997, no additional analytical data for total uranium from the second quarter 1997 was available for determining the geometry of the plume.

Action: Future IEMP quarterly status reports will include a total uranium plume map based on all available analytical data per the quarterly schedule outlined in the last paragraph of Section 3.7.2 of the IEMP. For the IEMP Quarterly Status Report for Third Quarter 1997, the map is provided in Figure 1-17.

5. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 1.3 Pg.#: NA Line#: NA Code:
 Original General Comment# 5

Comment: This section evaluates groundwater monitoring results. Section 3.7.1 on Page 3-83 of the IEMP states that DOE will compare monitored total uranium concentrations to modeled total uranium concentrations in order to determine whether concentrations are decreasing or increasing as the model predicted. This comparison is not discussed in the quarterly report. DOE should specify which wells will supply the data for this comparison and should report the results of the comparison in future quarterly reports.

Response: Note on page 3-83 of the IEMP, in the sentence immediately preceding the one that is the subject of this comment, the "predicted contaminant concentration profiles over time will be checked yearly using water quality data collected from designated monitoring wells." It is intended that the noted comparisons are to be provided yearly in the IEMP annual report. These comparisons are likely to begin after the current groundwater model upgrades are farther along as was noted in the responses to EPA and OEPA comments on the Draft South Plume Removal Action Design Monitoring Evaluation Program Plan System Evaluation Report for January 1 - June 30, 1997.

A comparison between monitored total uranium concentrations and modeled concentrations was provided in the approved responses to EPA comments on the September 1997 Design Monitoring Evaluation Program Plan (DMEPP) System Evaluation Report (see Responses to EPA and OEPA Comments on the Draft South Plume Removal Action Design Monitoring Evaluation Program Plan System Evaluation Report for January 1 - June 30, 1997). As outlined in the comment response, DOE recognizes that the current SWIFT model is inadequate to track the progress of the aquifer remedy on a well-by-well basis due to limitations in the SWIFT code. Because of these limitations, DOE has initiated a model upgrade project which will, if successful, result in a more robust modeling code. The first phase of this upgraded model is scheduled to be available to DOE before the South Plume Optimization and South Field Extraction Systems are brought on line later in fiscal year 1998 and may be used to make more reliable predictions of recovery well concentrations as the aquifer remedy progresses.

When the first phase of the modeling upgrade project is successfully completed, and after the additional extraction/injection modules are operational, DOE will use the model to predict total uranium concentrations on a well-by-well basis for comparison with the observed concentrations. These comparisons will be used to help assess if the remediation system is meeting the objectives as outlined in Figure 3-19 of the IEMP. The results of these comparisons will likely be available to be reported in the annual IEMP report for 1998 to be issued in June 1999. However, if the results are available prior to that time, they will be reported to the EPA and OEPA at the quarterly IEMP meeting following generation of the comparisons (if such meetings are held).

Action: None required at this time.

6. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 1.4 Pg.#: NA Line#: NA Code:
Original General Comment# 6

Comment: DOE is required to install horizontal wells in order to collect groundwater in the perched aquifer zone of the till unit beneath the On-Site Disposal Facility and is further required to sample these wells. However, no horizontal well installation or sampling activity is discussed in the quarterly report. DOE should include this information in future quarterly reports.

Response: DOE agrees with the comment.

Action: Status information pertaining to the on-site disposal facility horizontal till wells will be included in future IEMP quarterly status reports, beginning with the IEMP Quarterly Status Report for Fourth Quarter 1997 to be issued in March 1998.

7. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 4.2 Pg.#: NA Line#: NA Code:
Original General Comment# 7

Comment: This section and the cover letter for the quarterly report propose that visual monitoring of Paddys Run be suspended following storm events because it is unnecessary. Although it is appropriate to propose such actions in the quarterly report, any decision to suspend an ongoing environmental measurement should be delayed until U.S. EPA has reviewed the annual report, which will include more data for evaluation of the proposal.

Response: Since the time that this comment was issued, EPA has provided verbal approval to cease the monitoring of sediment loading to Paddys Run in support of the Sloan's crayfish monitoring.

Action: Text will be added to the March, 1998 IEMP Quarterly Status Report for Fourth Quarter 1997 to identify that EPA has given verbal approval to cease monitoring sediment loading to Paddys Run.

Specific Comments

8. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 1.2 Pg.#: 1-2 Line#: 19 to 24 Code:
 Original Specific Comment# 1
 Comment: The text states that recovery well (RW- 4) continues to pump groundwater at a rate of 400 gallons per minute and collect groundwater with an average total uranium concentration of 2 $\mu\text{g/L}$. These values result in an extremely low well efficiency rating. The main purpose of RW-4 is apparently to capture the northeast portion of the total uranium plume. However, U.S. EPA has commented previously that RW-4 pumping may not be sufficient to capture the northeast portion of the plume. DOE is presently evaluating the capture of the total uranium plume in the northeast portion of the plume. DOE should consider alternatives for more efficient capture of the northeast portion of the plume, such as discontinuing use of RW-4 and installing an extraction well at the front edge of the northeast portion of the plume.
- Response: Several meetings were held between DOE, EPA, and OEPA between September 1996 and March 1997 to address the off-property access considerations for additional wells in the South Plume area to enhance recovery efficiency. The issues addressed at these meetings and model studies performed to evaluate various options to enhance the South Plume Recovery System are presented in the approved Baseline Remedial Strategy Report Remedial Design for Aquifer Restoration (BRSR), Sections 5.1.2, 5.2.1 and Appendix E.
- As outlined in the BRSR, DOE modified the aquifer remedy design after the meetings with EPA and OEPA and after addressing concerns of the affected off-property land owner. The modifications agreed to and outlined in the BRSR include the installation of Recovery Wells 6 and 7 to enhance the recovery efficiency of the existing South Plume System with a contingency well, 3N, for future consideration based on the actual remedy performance data.
- Action: DOE will continue to evaluate the capture of the northeastern lobe of the plume as the additional extraction/injection systems in the aquifer remedy are brought on line during the next several months (i.e., South Plume Optimization, South Field Extraction - Phase I, and Injection Demonstration systems). DOE will also continue to evaluate groundwater remedy performance (including recovery well efficiencies) in accordance with the IEMP and continue to follow the established decision-making process regarding future system design changes as outlined in Figure 3-18 of the IEMP.
9. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 1.2 Pg.#: 1-3 Line#: 26 Code:
 Original Specific Comment# 2
 Comment: The text cites Figure 1-8 which shows the daily total uranium concentration in South Plume discharge water. The figure indicates that there have been 4 days when the daily concentration of total uranium has exceeded the discharge limit of 20 $\mu\text{g/L}$. DOE should explain each such exceedance and describe the duration and concentration of the exceedance. In addition, it is unclear how much of the South Plume discharge water was treated during the quarter; Table 1-5 indicates only that some of the water was treated. DOE should specify when and how much South Plume discharge water is

treated and how much discharge is discharged without treatment in future quarterly reports. In addition, DOE should specify the minimum, maximum, and average total uranium concentrations in the discharge water sent for treatment and in that discharged in future quarterly reports.

Response: Figure 1-8 portrays the uranium concentrations in the combined groundwater stream that is pumped from the South Plume extraction wells. The title of the figure appears to have caused some confusion. DOE does not agree that explaining exceedances of 20 µg/L total uranium in pumped groundwater is required. The 20 µg/L total uranium discharge limit for the FEMP site pertains to the concentrations measured at the Parshall Flume which discharges the blended site effluent to the Great Miami River. This limit was not in effect in 1997.

The requested information on the amounts of groundwater both treated and discharged without treatment are provided in Table 1-5 of the IEMP Quarterly Status Report for Third Quarter 1997. The table also includes the minimum, maximum, and average monthly concentrations in groundwater from the South Plume Recovery System. Since the combined water from this system is sampled prior to the treatment/direct discharge split, these statistics represent both the concentration in the groundwater sent to treatment and in groundwater sent directly to the Great Miami River via the Parshall flume. This information will continue to be reported in future IEMP quarterly status reports. Also, as noted in Section 2.0 of the IEMP Quarterly Status Report for Third Quarter 1997, the FEMP met the uranium discharge limit of a monthly average uranium concentration of 20 µg/L in water discharged to the Great Miami River during the first 9 months of 1997. Compliance with this limit continued for the remainder of the year even though the limit did not become effective until January 1998.

Action: In future IEMP reports, revise the title of Figure 1-8 (from the IEMP Quarterly Status Report for Third Quarter 1997) to better reflect the information provided on the figure. The revised title will be: "Daily Total Uranium Concentrations in Extracted South Plume Groundwater." In the IEMP Quarterly Status Report for Fourth Quarter 1997, this figure is Figure 1-12.

10. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 1.3.2 Pg.#: 1-3 Line#: 17 Code:
Original Specific Comment# 3

Comment: The text mentions Type 2 and Type 3 monitoring wells and discusses similarities between their elevation surfaces. In future quarterly reports, DOE should define these types of wells and discuss the differences between them. This addition to the reports would eliminate the need for the reader to consult the IEMP or other documents in order to understand the differences between the well types.

Response: As presented in Section 2.1.3.2 of the Operable Unit 5 RI Report, and in Section 5.1.2 and Figure 5-3 of the Operable Unit 5 Record of Decision, Type 2 groundwater monitoring wells are screened just below the water table near the top of the aquifer. Type 3 groundwater monitoring wells are screened near the middle of the aquifer just above the blue clay or the stratigraphic equivalent of the blue clay. Type 4 groundwater monitoring wells are screened at the bottom of the aquifer just above the bedrock.

Based on a statistical study of groundwater elevation data from Type 2, Type 3, and Type 4 groundwater monitoring well clusters presented in Section 2.2.2 of the SWIFT Great Miami Aquifer Model Summary of Improvements Report, there are no significant vertical hydraulic gradients in the Great Miami Aquifer. Therefore, although DOE

continues to collect and analyze groundwater elevation data from Type 3 groundwater monitoring wells, no significant differences between the Type 2 and Type 3 well elevation results are expected at this time. Differences between Type 2 and Type 3 monitoring well elevation data may become more pronounced as additional pumping from the aquifer occurs with the implementation of the complete Operable Unit 5 aquifer remedy.

With a complex site such as the FEMP, which has a long history of document releases, a certain level of familiarity with site history and site-specific terminology must be assumed.

DOE will continue to collect and analyze groundwater elevation data from Type 2 and Type 3 monitoring wells and will continue to present those results in future reports. Should significant differences be observed in the future between the two sets of groundwater elevation data, DOE will point out and discuss the significance of those differences in future reports.

Action: A diagram depicting the various types of monitoring wells at the FEMP will be provided in the IEMP annual reports.

11. **Commenting Organization:** U.S. EPA **Commentor:** Saric
Section#: 1.3.2 **Pg.#:** 1-4 **Line#:** 9 **Code:**
Original Specific Comment# 4
Comment: The text states that the colloidal borescope data were filtered to eliminate outliers before plotting. The filtered data were then used to support conclusions regarding capture zones drawn from groundwater elevation data. Future quarterly reports should include the filtering criteria used for deleting data as outliers and should cite a document that describes the data manipulation process in detail.
Response: The borescope software uses a filtering technique to automatically remove outlier data from consideration. The technique uses a rolling point deletion approach where each data point in a window of data points is omitted from the standard deviation (SD) calculation. If the SD changes by more than 25 percent without the suspect point, the point is filtered out, the data window is advanced one point, and the calculation is repeated.
Action: When the IEMP is revised later this year, DOE will include more information on the use of the colloidal borescope.
12. **Commenting Organization:** U.S. EPA **Commentor:** Saric
Section#: 1.3.2 **Pg.#:** 1-4 **Line#:** NA **Code:**
Original Specific Comment# 5
Comment: The text sites various figures showing groundwater elevation data and groundwater flow direction. Figure 1-27 is consistent with the borescope data in Figures 1-19 through 1-26. However, the direction of groundwater flow indicated by Figures 1-15 and 1-16 (specifically, the groundwater elevation data for wells 2899, 3899, 2898, and 2898) does not match the groundwater flow direction indicated by Figure 1-28 or the borescope data. DOE should explain the discrepancies between the different methods of determining groundwater flow direction and should discuss the impact of these discrepancies on determining the actual capture zone for the uranium plume in future quarterly reports.
Response: The discrepancies noted in the comment between interpreted flow directions from measured data (i.e., Figures 1-11 through 1-18 and Figure 1-27) appear because of a difference in measurement scale between the flow interpreted from groundwater

elevation contours and the flow interpreted from borescope observations. With the spacing of groundwater monitoring wells, groundwater flow interpreted from elevation data (Figures 1-11 through 1-18) is on a large scale. Small localized changes to regional flow (induced by pumping wells for example) will be harder to identify on these interpretations. Flow interpretations from borescope data (Figure 1-27) however are localized, small-scale observations which are more sensitive to local anomalies in the flow field (such as the presence of a nearby pumping well).

The discrepancies noted in the comment between flow directions interpreted from measured data as opposed to modeled data was pointed out in a previous EPA comment on the September 1997 DMEPP System Evaluation Report. See the response to EPA Comment #2 in Responses to EPA and OEPA Comments on the Draft South Plume Removal Action Design Monitoring Evaluation Program Plan System Evaluation Report for January 1 - June 30, 1997.

Action: The groundwater flow discrepancies noted between modeled data and measured data are being investigated by DOE and preliminary findings will be presented in the IEMP Quarterly Status Report for Fourth Quarter 1997 issued in March 1998 (see page 1-3 and Figure 1-21). When the IEMP is revised later this year, DOE will include a discussion on the use of the colloidal borescope.

13. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 1.6 Pg.#: 1-7 Line#: 29 to 35 Code:
Original Specific Comment# 6

Comment: The text discusses the findings and future focus of the South Plume Module Operation. However, no discussion is provided regarding potential adjustments to the operation based on recovery well efficiencies. For example, the recovery efficiency was very low for RW-4 while recovery efficiencies steadily increased for RW-3, RW-2 and RW-1; however, the text does not discuss potential operation adjustments in light of these efficiencies. Future quarterly reports should discuss this matter and its impact on the future focus of the operation.

Response: This comment is similar to Comment #8. Please refer to the response for Comment #8.
Action: Please refer to the action for Comment #8.

14. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 1.7 Pg.#: 1-8 Line#: 21 Code:
Original Specific Comment# 7

Comment: The text refers to final remediation level (FRL) exceedances outside the 10-year restoration footprint as being sporadic and isolated. However, the FRL exceedances do not appear to be sporadic and isolated when the sampling data provided in Table 1-6 are compared to the sampling locations identified in Figure 1-29. FRL exceedances for zinc and manganese consistently appear northwest and west of the 10-year restoration footprint. DOE should address this matter in future quarterly reports.

Response: DOE is committed to continue tracking FRL exceedances that appear outside of the uranium based aquifer restoration footprint during the routine monitoring of the property boundary wells. As explained below, the EPAs will receive a report in March titled "Restoration Area Verification Sampling Program Summary Report" that will further explain this commitment.

The need to further investigate sporadic and isolated FRL exceedances was identified as part of the Operable Unit 5 RI/FS. It was determined during the RI/FS that data limitations prevented a thorough evaluation of sporadic and isolated detections of some

FRL exceedances and that future work would need to be conducted to address the data limitations.

In the fall of 1996 a Project Specific Plan was prepared to address the issue titled the Restoration Area Verification Sampling (RAVS) Program Project Specific Plan. The RAVS plan investigated FRL exceedances detected outside of the restoration footprint to determine if they were attributable to the FEMP, one-time occurrences, were persistent and of such magnitude that they required a modification of the uranium based groundwater remedy, or required additional monitoring to determine what additional action should be taken. In preparing the plan, 14 constituents with FRL exceedances outside of the restoration footprint were evaluated (Appendix A of the RAVS PSP). Ten of the 14 constituents were determined to be either one time occurrences, or not attributable to the FEMP and therefore were dismissed from further consideration. The remaining four constituents (antimony, lead, manganese, and zinc) were sampled for at the required locations during 1997.

The results of the sampling indicate that, based on the approved RAVS PSP data evaluation protocol, all four constituents at the specified locations can be dropped from further consideration at this time. The March report referred to above states the following: "With the completion of the RAVS PSP monitoring, future groundwater sampling will for the most part focus on the interior of the aquifer restoration footprint. However, the IEMP does outline continued monitoring of the property boundary wells, some of which are located outside of the aquifer restoration footprint. Any FRL exceedance detected at a property boundary well location will be evaluated utilizing the same data evaluation protocol which was approved for the RAVS PSP in order to determine if additional action is required. Results of the ongoing monitoring and data interpretation at the property boundary wells will be communicated to the EPA and OEPA using IEMP reporting deliverables." As noted in the IEMP Section 3.7.2, FRL exceedances will be evaluated in the IEMP annual report. This includes FRL exceedances found outside the aquifer restoration footprint.

Action: No action required.

15. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 2.3 Pg.#: 2-5 Line#: 25 to 27 Code:
 Original Specific Comment# 8
- Comment: The text refers to treatment system bypass events that occurred through the end of September 1997. DOE is required to notify the regulatory agencies of bypass events and identify the duration and quantity of each event. Each future quarterly report should include a table summarizing this information for the quarter.
- Response: DOE agrees with the requirement. During 1997, DOE complied with the requirement by sending notification letters following each bypass event. These letters provided the duration and quantity of each event.
- Action: DOE agrees to provide summary-level information regarding quarter-specific bypass events as requested in each quarterly report. DOE will also summarize the entire year's bypass events in the June 1998 transitional IEMP annual report.

16. Commenting Organization: U.S. EPA Commentor: Saric
Section#: Table 3-2 Pg.#: 3-9 Line#: NA Code:

Original Specific Comment# 9

Comment: The table lists total suspended particulate analytical results. In future quarterly reports, the table should include the general or site-specific regulatory limits for total suspended particulate.

Response: Total particulate concentrations at the facility fenceline can be influenced by many non-FEMP activities including the crop farming and sand/gravel mining operations surrounding the site. As such, there are no general or site-specific regulatory limits associated with the environmental total particulate measurements used in the data evaluation process. Rather, the site currently evaluates total particulate data together with total uranium results, tracking data over time to identify any significant trends.

Action: No action required.

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17. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 1.2 Pg.#: 1-2 Line#: 11-12 Code: C
 Original Comment# 1
 Comment: The text indicates that the groundwater extraction system operated at 1400 gpm except for Recovery Well 3924 (RW-1), which was out of service for three days. Tables 1-2 to 1-4 indicate that wells RW-2, RW-3, and RW-4 were also not operational for at least one day each during this reporting period. The text should be revised to state that "Each of the recovery wells were out of service for a period of less than three days each for routine well maintenance during the reporting period."
 Response: DOE agrees that the text would have been more accurate if written as suggested.
 Action: DOE will continue to report recovery well outages in the operational tables of the IEMP quarterly status reports (in the IEMP Quarterly Status Report for Fourth Quarter 1997, see Tables 1-2 through 1-5 and page 1-1) and will ensure that the summary text in future IEMP reports is consistent with the tables.
18. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 1.2 Pg.#: 1-2 Line#: 11 Code: C
 Original Comment# 2
 Comment: As previously requested in the comments to the January 1-June 30, 1997 South Plume Removal Action System Evaluation Report, daily extraction rates should be provided graphically and in either an 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 periods of well outages.
 Response: DOE agrees with the comment.
 Action: Future IEMP quarterly status reports will include a graph of average daily pumping rates (gpm) for each recovery well for the reporting period (in the IEMP Quarterly Status Report for Fourth Quarter 1997, see Figures 1-4 through 1-7). The data will also be provided in electronic format on an enclosed floppy disk.
19. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 1.3.2 Pg.#: 1-3 Line#: 17-23 Code: C
 Original Comment# 3
 Comment: As indicated in OEPA's comments to the Project Specific Plan (PSP) for the Re-injection Demonstration Test Plan for August 1997, DOE was requested to improve the development and presentation of groundwater elevation maps in future documents. For example, all groundwater elevation maps will show the location of the bedrock highs which strongly control groundwater flow directions. No such improvements are evident in the figures provided in this document. Figures 1-11 through 1-18 appear to have been contoured using computer-generated contouring without the necessary follow-up hydro geologic interpretation and correction. The right angle curve of the 524 ft contour at Well 2033 in the northwest portion of Figure 1-11, for example, is particularly suspect. In addition, page 3-79 of the IEMP specifically indicates that capture zones and divides will be provided on groundwater elevation maps. A number of groundwater divides exist on Figures 1-11 through 1-18 and are undelineated. Capture zones should also be shown to their fullest extent possible on the groundwater elevation maps.

Response: The commentor has identified four issues with respect to the presentation of groundwater elevation maps in the report:

- 1) Inclusion of bedrock highs on groundwater elevation maps,
- 2) Labeling of groundwater divides on the elevation maps,
- 3) Showing capture zones to their fullest extent on the elevation maps, and
- 4) Hydrogeologic evaluation and modification of the computer generated contours on the elevation maps.

DOE agreed to include bedrock highs on groundwater elevation maps in response to OEPA comments on the Re-injection Demonstration Test Plan, which were submitted to OEPA in December 1997 and were approved by OEPA in late January 1998. The bedrock highs and flow divides will be placed on groundwater elevation maps provided in future IEMP quarterly status reports.

The capture zone imposed by the South Plume Recovery Wells is indicated on Figures 1-11, 1-13, 1-15, and 1-17. While the interpreted capture zone could have been extended one or possibly two elevation contours further to the north, the shape of the elevation contours precludes extending the interpreted capture zone much further than this. As additional extraction wells are brought on line in the South Field and South Plume Optimization systems, the interpreted capture zone will be extended further north around these additional pumping wells, as appropriate.

The groundwater elevation maps are computer generated and are reviewed for accuracy. While the commentor correctly identifies some artifacts of the computer contouring algorithm, DOE does not believe that smoothing the artifacts in question by hand would significantly change the hydrologic interpretation.

Action: DOE will include bedrock highs and interpreted groundwater flow divides on groundwater elevation maps in future IEMP quarterly status reports (for the IEMP Quarterly Status Report for Fourth Quarter, these maps are provided in Figures 1-18 and 1-19). Capture zones interpreted from these maps will continue to be provided for the Type 2 monitoring well depths and will be extended as far as interpretation of the elevation contours permit. Groundwater elevation maps will continue to be contoured by computer algorithm and checked for accuracy. Changes will be made to computer-generated contour maps only where significant changes are required to reflect a plausible hydrogeologic interpretation.

20. **Commenting Organization:** OEPA **Commentor:** HSI GeoTrans, Inc.
Section#: 1.2 **Pg.#:** 1-2 **Line#:** 11 **Code:** C
Original Comment# 4

Comment: As previously requested in the comments to the January 1-June 30, 1997 South Plume Removal Action System Evaluation Report, daily extraction rates should be provided 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 periods of well outages.

Response: This comment is the same as Comment #18. See Comment Response #18.

Action: See Action #18.

21. Commenting Organization: OEPA
 Section#: 1.3.2 Pg.#: 1-3 Line#: 17-23 Commentor: HSI GeoTrans, Inc.
 Original Comment# 5 Code: C

Comment: As indicated in OEPA's comments to the Project Specific Plan (PSP) for the Re-injection Demonstration Test Plan for August 1997, DOE was requested to improve the development and presentation of groundwater elevation maps in future documents. For example, all groundwater elevation maps will show the location of the bedrock highs which strongly control groundwater flow directions. No such improvements are evident in the figures provided in this document. Figures 1-11 through 1-18 appear to have been contoured using computer-generated contouring without the necessary follow-up hydro geologic interpretation and correction. The right angle curve of the 524 ft. contour at Well 2033 in the northwest portion of Figure 1-11, for example, is particularly suspect. In addition, page 3-79 of the IEMP specifically indicates that capture zones and divides will be provided on groundwater elevation maps. A number of groundwater divides exist on Figures 1-11 through 1-18 and are undelineated. Capture zones should also be shown to their fullest extent possible on the groundwater elevation maps.

Response: This comment is the same as Comment #19. See Comment Response #19.
 Action: See Action #19.

22. Commenting Organization: OEPA
 Section#: 1.3.2 Pg.#: 1-4 Line#: 17-19 Commentor: HSI GeoTrans, Inc.
 Original Comment# 6 Code: C

Comment: The text should provide a discussion of the flow directions determined for 3900, 2899, and 2898.

Response: DOE agrees that the text should be presented regarding the borescope flow directions in Monitoring Wells 3900, 2899, and 2898.

The flow directions in these three wells are anomalous. The indicated flow direction is away from the interpreted capture zone in Monitoring Wells 2899 and 3900. Furthermore, flow directions observed in these wells differ significantly from the flow directions observed in the companion wells at the same locations (i.e., Monitoring Wells 3899 and 2900). Both companion wells 3899 and 2900 indicate flow toward the recovery wells. DOE does not fully understand why these observations don't agree but believes that these differences could be due to very localized preferential flow pathways in the immediate vicinity of the anomalous wells, perhaps caused by facies changes in the aquifer material.

In the case of Monitoring Well 2898, flow direction is indicated to the east while flow directions in the companion well (Monitoring Well 3898) at the same location are to the southwest. As indicated in Figure 1-27 of the IEMP Quarterly Status Report for Third Quarter 1997, DOE believes these two wells lie just outside the interpreted capture zone of the South Plume recovery system. Furthermore, DOE believes that the eastward groundwater flow at Monitoring Well 2898 is an indication of a natural flow divide due to a bedrock high directly southeast of this location. Groundwater from the New Haven trough exits the valley through the New Baltimore and Paddys Run outlets to the Great Miami River around this bedrock high as shown in Figure 2-2 of the Operable Unit 5 Remedial Investigation (RI) Report.

Action: A more detailed discussion of borescope data collected around the capture zone imposed by the South Plume recovery well system will be provided during the meeting with EPA and OEPA scheduled for April 1, 1998.

Response: The forward particle tracks are defined with respect to the SWIFT model velocity flow field. Therefore, the particles leave the model grid around the center of a model block. The recovery wells however, are plotted at their actual surveyed locations and therefore are not necessarily centered with respect to the model blocks. To correct the figure would mean changing the surveyed location of the recovery wells or arbitrarily shifting the particle track locations to terminate off center of the model blocks. DOE does not believe that either change is warranted.

Action: No action required.

25. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 1.6 Pg.#: 1-9 Line#: 3 Code: M
 Original Comment# 9

Comment: Future Integrated Environmental Monitoring Status reports should provide sitewide coverage with respect to the total uranium plume map and groundwater elevation maps. Additionally, total analytical data and water level data for the reporting period should be provided electronically. Future IEMP Quarterly Status Reports should present analysis and discussion of plume movements and should include trend analyses in key wells.

Response: As analytical data from the various activities in the IEMP are obtained, maps of analytical data will be expanded in scope across the site to cover the areas where data have been collected. The groundwater elevation maps as presented in Figures 1-11 through 1-18 of the Quarterly Status Report for Third Quarter 1997 already provide sitewide coverage.

Analytical data and water elevation data were provided in electronic format on floppy disk for this IEMP Quarterly Status Report for Third Quarter 1997 in a separate transmittal to EPA and OEPA during the first week of January 1998. Analytical and water elevation data will continue to be provided with future IEMP quarterly status reports.

Plume movement(s) were not addressed in this IEMP Quarterly Status Report for Third Quarter 1997 because only a very limited amount of new analytical data was available for reporting. Discussion of plume movement(s) will be included in future IEMP quarterly status reports if warranted by the available data presented. Generally, the individual well trend analyses and more detailed discussions about plume geometry will be included in the annual IEMP report as opposed to the quarterly status reports.

Action: As noted in the response.

26. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 3.0 Pg.#: 3-1 Line#: 32 Code: E
 Original Comment# 10

Comment: The word "stated" should be replaced by "discussed."

Response: The word stated was used appropriately to indicate that a status of transition activities associated with the radiological air particulate monitoring program as defined in the IEMP was included in the report.

Action: No action required.

27. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 2.1 Pg.#: 2-2 Line#: 30 Code: C
 Original Comment# 11
 Comment: This sentence seems to indicate that radiological constituents were sampled in support of the NPDES permit renewal when no radiological constituents fall under the NPDES umbrella.
 Response: Radiological constituents were analyzed in order to meet requirements identified in NPDES permit renewal forms, EPA 3510-2C and EPA 3510-2F. According to Form 2C, alpha, beta and radium were to be analyzed and according to Form 2F instructions, several radiological constituents were required to be analyzed (such as uranium) by the applicant if expected to be present.
 Action: No action required.
28. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 2.5 Pg.#: 2-6 Line#: 5 Code: C
 Original Comment# 12
 Comment: Bypass events have been characterized as "routine". Bypass occurs during unusually heavy precipitation events, whereas routinely storm water is treated in the AWWT.
 Response: DOE agrees with the comment. The term "routine" is incorrectly used in this sentence.
 Action: Bypass events will not be characterized as routine in future IEMP reports. The bypass events are accomplished in accordance with standard operating procedures and are completed infrequently rather than routinely.
29. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: Table 2-1 Pg.#: 2-8 Line#: Code: C
 Original Comment# 13
 Comment: It is not clear in Table 2-1 why the total number of samples is two for some parameters and one for others. For example at location STRM 4005, two samples are listed for total chromium and copper but one for lead. The NPDES permit specifies two samples per year for each of those parameters at this location. It would seem that if two samples were taken for total chromium and copper, than two would also have been taken for lead.
 Response: As identified in Section 2.2, page 2-3, lines 8 through 9 of the Integrated Environmental Monitoring Status Report for Third Quarter 1997, "Detection limits for several constituents associated with pre-IEMP surface water activities were above FRLs and/or BTVs; therefore, these results were not used in this data evaluation." Lead was sampled twice during the reporting period: once for NPDES permit compliance (June 1997) and once for NPDES permit renewal (July 1997). The sample from the NPDES permit compliance was not included in the data evaluation because the detection limit was above the lead FRL; therefore, the total number of samples for lead in Table 2-1 was identified as one. To alleviate confusion in the future, the column identified as "Total Number of Samples" will be based on all valid data (i.e., no R or Z qualified data).
 Action: For future IEMP reports, the total number of samples presented in each table will be based on all valid data collected. (For the IEMP Quarterly Status Report for Fourth Quarter 1997, see Tables 2-2 and 2-3.)
30. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 3.1 Pg.#: 3-1 Line#: 12 Code: E
 Original Comment# 14
 Comment: Check the spelling of "thermolumiscent".

Response: Spelling of this word, "thermoluminescent" has been checked and corrected.
 Action: "Thermoluminescent" will be correctly spelled in future IEMP quarterly status reports.

31. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: Figures 3-2 thru 3-6 Pg.#: Line#: Code: E
 Original Comment# 15
 Comment: The titles to these figures are not readily understood. We suggest "Total uranium particulate concentrations in air".
 Response: DOE agrees with the comment. The IEMP identifies that total uranium particulate and total particulate concentrations are analyzed for the "Radiological Air Particulate Monitoring Program"; however, in order to better reflect the data presented, both the figures and tables associated with total uranium will be updated to "Total uranium particulate concentrations in air."
 Action: Figures and tables associated with the uranium particulate concentrations will be titled, "Total uranium particulate concentrations in air." (For the IEMP Quarterly Status Report for Fourth Quarter 1997, see Table 2-1 and Figures 3-3 through 3-8.)
32. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: Figures 3-7 thru 3-9 Pg.#: Line#: Code: E
 Original Comment# 16
 Comment: The word "radiological" in the titles to these figures should be omitted.
 Response: DOE agrees with the comment.
 Action: Figures and tables associated with the particulate concentrations will be titled, "Total Particulate Concentrations in Air."
33. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 3.2 Pg.#: 3-2 Line#: 9-10 Code: C
 Original Comment# 17
 Comment: Reword the sentence "There is no impact....". I believe the intention of this sentence was to state that the removal of this sampling location will not change the reporting requirements in 1998.
 Response: DOE agrees with the comment.
 Action: No action required.
34. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 3.2 Pg.#: 3-2 Line#: 13 Code: C
 Original Comment# 18
 Comment: The report states that both total uranium and TSP as tabulated are within historical ranges but the tables do not include any historical data. Provide a historical range of these values.
 Response: DOE agrees with the comment. Data from 1990 through 1995 has been summarized and provided in tables corresponding to both total uranium and total particulate (previously identified as TSP) and will be provided in future IEMP quarterly status reports. Data from 1996 provided in this report will also be presented in future IEMP quarterly status reports.
 Action: Historical ranges from 1990 through 1995 for total uranium and total particulate will be provided in future IEMP quarterly status reports. (For the IEMP Quarterly Status Report for Fourth Quarter 1997, see Tables 3-1 and 3-2.)

35. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section#: 3.2 Pg.#: 3-2 Line#: 17 Code: C
Original Comment# 19

Comment: The reference to the NESHAP Subpart H compliance limit is not appropriate in this discussion of monitoring results. Omit the discussion from this section (and the sidebar in Table 3-1) and defer it to the NESHAP's compliance report.

Response: DOE recognizes that dose calculations based solely on total uranium concentrations have certain limitations. However, since historical data indicates that uranium consistently accounts for greater than 80 percent of the dose associated with the air particulate data, this estimate provides a useful indicator for tracking the dose at the site boundary. Providing the comparison to the NESHAP standard assists in framing the significance of the dose based on the regulatory standard. This comparison is not intended to serve as a demonstration of compliance with the NESHAP standard.

Beginning with the IEMP Quarterly Status Report for First Quarter 1998, compliance with the NESHAP standard will be demonstrated using results from quarterly composite samples as specified in Section 6 and Appendix C of the IEMP. This data will be presented in IEMP quarterly and annual reports.

Action: No action required.

36. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section#: 3.2 Pg.#: 3-2 Line#: 25 Code: C
Original Comment# 20

Comment: There may be some evidence for increasing trends in the TSP data. AMS-3 (Figure 3-7), AMS-8A (Figure 3-8), and AMS-9B (Figure 3-9) may be showing an increase at the end of this reporting period. All of these air monitoring stations are along the east fence line. It will be interesting to see if more recent data also support a trend. An effort should be made to correlate these data with site construction activity or near-by farming activities.

Response: Similarly, AMS-4 (Figure 3-3) and AMS-5 (Figure 3-4) appear to show 'spikes' in the mid-July to early August time-frame for particulate uranium. Has an attempt been made to correlate these observations to site activities? It is worth noting that the AMS-5 maximum is at least twice as large as any other off-site air monitoring station. DOE agrees that information pertaining to site remediation activities should be included as part of the data presentations when significant changes (based on the data evaluation criteria presented in each of the media-specific sections of the IEMP) in the data are observed and can be attributed to these activities. The increases in total particulate concentrations in the eastern fenceline monitors are most likely due to the construction activities associated with the on-site disposal facility and the construction of the new north access road in conjunction with dryer, warmer weather during this time period.

No attempt was made to correlate the uranium results observed at AMS-4 and AMS-5 during mid-July and early August to site activities since the single data points at each location were not considered significant. The two data points in question were noted at the time as being elevated relative to the historical data sets. However, when considered in light of the extremely low concentrations and the limited duration (a single data point at each location), DOE did not believe additional evaluation was warranted.

Action: Future IEMP quarterly status reports will include discussions of any correlations which may be identified between site events and significant changes in environmental data.

37. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 3.2 Pg.#: 3-2 Line#: Code:
 Original Comment# 21
 Comment: Future quarterly status reports should include an attempt to correlate air particulate monitoring results with site activities such as excavation, demolition and construction.
 Response: See Comment Response #36.
 Action: See Action #36.
38. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 3.2.1 Pg.#: 3-3 Line#: 12-14 Code: C
 Original Comment# 22
 Comment: AMS-17(WP) is not included as an air monitoring station that will be removed in 1998 due to the implementation of the IEMP. This air monitoring station was not in service as of January 15, 1998.
 Response: The Waste Pit Area air monitors (AMS-17 through AMS-20) were part of a project-specific monitoring network installed in 1992 to evaluate radionuclide fugitive emissions from the waste pits. With implementation of the radiological air particulate monitoring program specified in the IEMP, fugitive emissions associated with the waste pit area will be monitored collectively with other project emissions to evaluate compliance with NESHAP Subpart H requirements. As such, the four waste pit monitors were removed from service January 9, 1998. As implementation of the remedy for Operable Unit 1 proceeds, future needs for project-specific environmental air monitoring will be evaluated based on the pertinent ARARs and process control needs of the project.
 Action: No action required.
39. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 3.2.1 Pg.#: 3-3 Line#: 12-14 Code: C
 Original Comment# 23
 Comment: The Ohio EPA plans on operating the air monitoring stations located at AMS-13 and AMS-11 beginning in early 1998.
 Response: Acknowledged.
 Action: No action required.
40. Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
 Section#: 3.2.2 Pg.#: 3-3 Line#: 24 Code: C
 Original Comment# 24
 Comment: This section mentions project-specific air monitoring to be initiated in support of D & D of the Plant/Thorium Complex. Describe how the monitoring results will be reported in future quarterly status reports.
 Response: As stated in Section 6.6.4 of the IEMP, summary level information pertaining to the project-specific results will be presented as necessary to support the interpretation of the IEMP air monitoring program data.
 Action: No action required.

