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U-007-505.3

**RESPONSES TO COMMENTS ON THE RECORD OF DECISION FOR
REMEDIAL ACTION AT OPERABLE UNIT 5 OF AUGUST 1995 -
NOVEMBER 1995**

11/09/95

**DOE-0165-96
DOE-FN EPAS
125
RESPONSES**

**RESPONSES TO COMMENTS
ON THE RECORD OF DECISION
FOR REMEDIAL ACTION
AT OPERABLE UNIT 5
OF AUGUST 1995**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO**

NOVEMBER 1995

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

INTRODUCTION

The U.S. Department of Energy's (DOE) responses to U.S. Environmental Protection Agency (EPA) and Ohio EPA (OEPA) comments on the August 1995 draft Record of Decision for Remedial Actions at Operable Unit 5 (ROD) are provided herein. A total of 73 comments were submitted; 28 (Nos. 1 to 28) from EPA and 45 (Nos. 29 to 73) from OEPA. DOE's responses are provided in the usual template format.

The sequential number DOE has assigned to each comment appears in the left margin. The original comment number assigned by each agency remains within the template, on the third line. A comment number cross reference list is included for each agency's comments.

The cross-reference list repeats the information from the comment template and adds, in the first and last columns, the sequential DOE-assigned comment number and the page number in the revised document where the resultant action appears, respectively. In the ROD, the DOE-assigned number appears in the left margin of the text at the beginning of the paragraph containing the struckout material and/or the redlined revision. In the New Page No. column, NA means a no-action response and G means a general comment affecting several different sections/appendices.

Page and line numbers used in responses and actions reference the August ROD.

The Foreword to the ROD explains how the text reflects the placement and nature of the comment responses.

**COMMENT CROSS-REFERENCE LIST FOR EPA COMMENTS
ON THE AUGUST 1995 OPERABLE UNIT 5 ROD**

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DOE No.	Commenting Organization	Commentor	Original Comment No.	Section	Original Page No.	Line No.	New Page No.*
1	U.S. EPA	Saric	Technical 1				G
2	U.S. EPA	Barwick	Original 1	7	7-2	27-33	NA
3	U.S. EPA	Saric	Specific 1	7.1.3	7-2	32	NA
4	U.S. EPA	Barwick	2	7	7-7, 7-10	33-34, 1-2	7-7
5	U.S. EPA	Barwick	3	7	7-10	38-39	7-10
6	U.S. EPA	Barwick	4	7	7-13	20-21	7-13
7	U.S. EPA	Barwick	5	8	8-2	13-14	8-2
8	U.S. EPA	Barwick	6	8	8-11	5-8	8-10, 8-11, 10-14, 10-15, 11-1, A.2-4
9	U.S. EPA	Saric	General 2	9			9-14
10	U.S. EPA	Saric	General 3	9			9-2
11	U.S. EPA	Saric	General 4	9			NA
12	U.S. EPA	Saric	General 5	9			9-19, 9-34
13	U.S. EPA	Saric	Specific 2	9.1.2	9-6	3-6	9-8
14	U.S. EPA	Saric	Specific 3	9.1.2	9-6	13-15	NA
15	U.S. EPA	Saric	Specific 4	9.1.5	9-10 & 9-11		D-ii, 9-13, 9-14, 9-15
16	U.S. EPA	Saric	Specific 5	9.1.8	9-15		9-19, 9-34
17	U.S. EPA	Barwick	7	9	9-15	27-31	NA
18	U.S. EPA	Saric	Specific 6	9.2	9-28	26-33	D-ii, 9-6
19	U.S. EPA	Saric	General 1	9 & 11			D-ii, 9-13, 9-15, 10-15
20	U.S. EPA	Saric	Specific 7	10.1.2	10-3	19-24	10-3
21	U.S. EPA	Saric	Specific 8	10.1.4	10-5	1&2	10-5
22	U.S. EPA	Barwick	8	10	10-5	2	10-5
23	U.S. EPA	Barwick	9	10	10-5	32	10-6, 10-13
24	U.S. EPA	Barwick	10	10.2.2	10-7 thru 10-10		10-6, 10-8
25	U.S. EPA	Saric	Specific 9	10.4	10-12	11-15	10-13
26	U.S. EPA	Saric	Specific 10	11	11-1 thru 11-3		11-1 thru 11-3
27	U.S. EPA	Barwick	12	A.3	A.3-138		In alphabetical order
28	U.S. EPA	Barwick	11	R	R1-R3		NA

*G means the change is applied to all appropriate places in the ROD

NA means a no-action response

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action has been provided to EPA and OEPA under separate cover (i.e., letter from Jack Craig to Jim Saric and Tom Schneider, "Evaluation of Removal Action 1: Extraction of Water Beneath Fernald Environmental Management Project Buildings," dated September 13, 1995). DOE fully intends to meet the requirements of 40 CFR § 300.415(f). The transition to remedial activities will be described in the Operable Unit 5 RD/RA work plans and associated documents.

Action: None required.

- 3. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 7.1.3 Pg.#: 7-2 Line#: 32 Code:
 Original Specific Comment# 1
 Comment: The text states that wells pumping contaminated perched water will be retired from operation following issuance of the ROD. DOE should justify this action and explain why it will not be necessary to continue this removal action activity and integrate it with the final remedial action.
 Response: This comment is similar to Comment 2 above. Please refer to the response to Comment 2.
 Action: None required.

- 4. Commenting Organization: U.S. EPA Commentor: Barwick
 Section#: 7 Pg.#: 7-7, 7-10 Line#: 33-34, 1-2 Code:
 Original Comment# 2
 Comment: Page 7-7, lines 33 and 34 and Page 7-10, lines 1 and 2. These lines are identical and appear to be a typographical error.
 Response: Agree, these sentences are duplicates.
 Action: Delete the sentence at the top of pg. 7-10.

- 5. Commenting Organization: U.S. EPA Commentor: Barwick
 Section#: 7 Pg.#: 7-10 Line#: 38-39 Code:
 Original Comment# 3
 Comment: Page 7-10, lines 38 and 39. This sentence would be more accurate as follows:

"Remedial actions pursuant to Sections 104 or 106 of CERCLA must meet the cleanup standards of Section 121 of CERCLA, including attainment of (or justification of a waiver from) ARARs."

State and Federal requirements expressed as ARARs may, absent application of CERCLA, apply directly to remedial activities.

 Response: Agree.
 Action: Replace lines 38-39 with the sentence written by the commentor.

- 6. Commenting Organization: U.S. EPA Commentor: Barwick
 Section#: 7 Pg.#: 7-13 Line#: 20-21 Code:
 Original Comment# 4
 Comment: Page 7-13, lines 20 and 21. Use of the term "treatment," which is an environmental term of art, is confusing in this context. The PCB Spill Cleanup Policy set forth in 40 CFR Part 761, Subpart G specifies cleanup levels and requires disposal of PCB contaminated materials pursuant to 40 CFR Part 761, Subpart D (see 40 CFR § 761.125(a)(2)) but does not set forth treatment standards. "Management" may be a better term.
 Response: Agree.
 Action: Delete the word "treatment" on line 21 and replace with "management."

7. Commenting Organization: U.S. EPA Commentor: Barwick
 Section#: 8 Pg.#: 8-2 Line#: 13-14 Code:
 Original Comment# 5
 Comment: Page 8-2, lines 13 and 14. This seems to suggest that there may be some consolidation and capping in place of contaminated materials and a separate on-site disposal unit. Is this the intent?
 Response: No, this was not the intent; the lines of text identified by the commentor were summarizing points for the full range of alternatives. To alleviate any confusion, the sentence will be modified as discussed below.
 Action: Modify sentence on pg. 8-2, line 13 with:consolidation with an earthen cover ("C" alternatives) or in an engineered on-property disposal facility.... ("A" alternatives) or ...disposal facility (Alternative 1).

8. Commenting Organization: U.S. EPA Commentor: Barwick
 Section#: 8 Pg.#: 8-11 Line#: 5-8 Code:
 Original Comment# 6
 Comment: Page 8-11, lines 5-8. As indicated in other U.S. EPA comments, this approach is not acceptable.
 Response: This comment reflects the need to update the agreement between the ROD remedy and the Proposed Plan remedy as a result of successful resolution of outstanding issues raised by both EPA and OEPA. As a result of these resolutions, Section 11.0, which outlined modifications to the remedy from the Proposed Plan, is no longer needed. DOE has revised page 8-11 (along with several others) to reflect the discussions held with EPA and Ohio EPA concerning resolution of outstanding ROD issues.
 Action: See revised pages 8-10, 8-11, 10-13, 10-14, and A.2-4 which have been revised to reflect the successful resolution of outstanding issues; Section 11 has been deleted for the same reason.

9. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 9 Pg.#: Line#: Code:
 Original General Comment# 2
 Comment: The ROD should establish the process for reporting and instituting corrective measures for the groundwater extraction and treatment system and the advanced wastewater treatment plant in the event that the 600-lb/yr mass discharge limit, the discharge concentration limit (to be established), or the in-stream concentration limit is exceeded. The process should include installation and operation of additional treatment units unless exceedances can be attributed to exceptional operating conditions.
 Response: DOE has committed to preparing an Operations and Maintenance Plan to guide extraction/reinjection and treatment system operations which will be submitted to EPA for review and approval as a remedial design deliverable. This plan would define the operating philosophy for these systems, establish the constraints of operation (i.e., conditions under which a given system must be operated or shutdown), and establish the process for reporting and instituting corrective measures to address exceedances of discharge limits. Text will be added to Section 9 referencing this remedial design obligation.
 Action: Add the following text on pg. 9-10, line 29: "The process for reporting and instituting corrective measures for the groundwater extraction and treatment systems, in the event discharge limits are exceeded, will be established as part of remedial design."

10. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 9 Pg.#: Line#: Code: 7262
Original General Comment# 3
Comment: DOE added language to Section 9 of the ROD in an attempt to clarify the fact that non-FEMP wastes will not be disposed of at FEMP. However, the language added to Section 9 is not satisfactory because it merely states that the ROD gives no approval for disposal of non-FEMP waste in the on-site disposal facility. U.S. EPA and OEPA need an explicit commitment from DOE that it will not allow non-FEMP waste to be disposed of at FEMP. The ROD should be revised accordingly.
Response: Agree.
Action: Replace first sentence at the top of pg. 9-2 with: This ROD provides an explicit prohibition to the placement of any waste generated off of the FEMP in the on-property disposal facility.

11. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 9 Pg.#: Line#: Code:
Original General Comment# 4
Comment: The ROD proposes to excavate the perched water zones to the extent necessary to eliminate threats to the Great Miami Aquifer. However, the ROD does not establish remediation levels by which compliance with this objective can be measured. The proposed plan identifies two criteria for determining perched water excavation zones: (1) all perched water zones capable of yielding 1 gpm or more and (2) all perched water zones that could cause contamination of the Great Miami Aquifer. The 1-gpm yield criteria should be eliminated because the on-site land use is considered to be undeveloped park. However, the ROD should identify perched water remediation levels. In addition, the following items should be specified in the ROD: (1) the levels of radioactive contaminants, volatile organic compounds, and other contaminants that will necessitate excavation; and (2) the methods to be used for verifying that cleanup levels have been achieved.
Response: DOE agrees with the commentor that the 1 gpm criterion is not an appropriate excavation criterion for the undeveloped park scenario, and that the perched groundwater excavation for this scenario is to be based on the potential for cross-media impacts to the underlying Great Miami Aquifer. However, DOE wishes to clarify that the Proposed Plan did explain this properly on pages 36 and 25. The commentor's notation of the presence of a 1 gpm criterion in the Proposed Plan appears to be in reference to the citations provided on pages 19 and 23 -- which apply to Land Use Objectives 1 and 2 (i.e., where an on-property resident farmer is, by definition, under consideration). For Land Use Objectives 3 and 4, the 1 gpm criterion is not applicable as the commentor correctly notes and the Proposed Plan properly portrays. In response to the second concern raised by the commentor, DOE desires to clarify that the perched groundwater cleanup requirements have, by definition, been taken into account in the establishment of the cross-media cleanup levels for soil, as explained in Section 4.0 and Appendix F of the Operable Unit 5 Feasibility Study Report. By excavating to meet soil cleanup levels that are intended to satisfy cross-media concerns, the twin objectives of soil cleanup (i.e., to address the "reservoir" of subsurface contamination available for cross media impact) and perched groundwater cleanup (i.e., to address the "pathway" for cross media impact following contaminant dissolution from the soil) will be satisfied. Separate remediation levels are therefore unnecessary because the soil levels explicitly incorporate perched groundwater "pathway" concerns. The success of perched groundwater remediation will be tracked by certifying that the Operable Unit 5 soil clean-up levels (which explicitly take into account the potential for cross media impact) have been met throughout the affected subsurface area. The ROD specifies

these soil cleanup levels and the remedial design process will delineate the final certification process to demonstrate that remedial action objectives have been achieved. DOE acknowledges that the remedial design is subject to EPA and OEPA review for concurrence in the procedures provided.

Action: None required.

12. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 9 Pg.#: Line#: Code:

Original General Comment# 5

Comment: The ROD proposes to designate the whole FEMP site as a CAMU. At the same time, the ROD prohibits disposal of ignitable, reactive, and corrosive wastes in the on-site disposal facility. The ROD should explicitly identify the types of RCRA wastes that may be disposed of in the CAMU without meeting Land Disposal Restrictions (LDR) or minimum technology requirements. Presumably these wastes would be listed either hazardous wastes (which are readily identifiable) or characteristically toxic hazardous wastes. This information is necessary to evaluate the need for the CAMU and to identify all the waste types that may be disposed of in the on-site disposal facility.

Response: This comment requests information concerning the types of RCRA wastes (both listed and characteristic) in Operable Unit 5 which are envisioned for disposal in the on-property disposal facility under the provisions of the CAMU rule. The intent of the comment is to identify what materials from Operable Unit 5 will not be treated to LDRs or minimum technology requirements before on-property disposal, consistent with the relief for such treatment offered by the CAMU rule. The RCRA wastes of interest include contaminated soil and wastewater treatment process residuals that together comprise the universe of remediation waste within Operable Unit 5. As background for the response to this comment, note that Comment 30 (made by OEPA concerning a restriction on the placement of RCRA characteristic waste in the on-property disposal facility) is directly relevant to this EPA comment. As a result of the successful resolution to Comment 30, coupled with the adoption of an implementation strategy to address OEPA's characteristic waste concern (added to Section 9.1.1 of the ROD), it is not envisioned that any significant quantity of RCRA characteristic materials will be placed in the disposal facility. The listed constituents that are present in Operable Unit 5 media will be disposed of in the on-property disposal facility up to the cut-off concentration levels established by the waste acceptance criteria. Contaminated media with levels that exceed the waste acceptance criteria will either be treated to meet the criteria or shipped off site for disposal. The listed substances (and waste codes) that are present in Operable Unit 5 media that are envisioned to be disposed of in the on-property disposal facility are: methylene chloride (F002), tetrachloroethylene (F002), toluene (F005), trichloroethylene (F002), 1,1,1-trichloroethane (F002), and xylene (F003). These constituents are summarized from Section 4.0 of the Operable Unit 5 FS Report.

Action: Strike sentence on page 9-15, line 11, beginning with "Wastes that exhibit..." Add two new paragraphs following line 14 to read: "DOE, EPA, and OEPA reviewed remedial investigation data and site process knowledge to determine if areas of soil exhibiting a RCRA characteristic could be identified which offered a reasonable opportunity for the application of a cost-effective level of treatment before disposal. This review was conducted to further satisfy the regulatory preference for treatment contained in Section 264.552 of the CAMU rule. The review identified six geographic areas of the FEMP where a reasonable potential exists for the presence of RCRA characteristic waste in soil. These areas are summarized in the remedy description for soil provided in Section 9.1.1. Recognizing that a protective remedy has been selected for Operable Unit 5 soil, coupled with the desire on the part of DOE, EPA and OEPA to satisfy the

regulatory preference for treatment, consensus has been reached by DOE, EPA, and OEPA that these six geographic areas represent the locations where a reasonable opportunity exists for cost-effective treatment of RCRA characteristic soil. DOE is committed to identifying, segregating and treating, as necessary, contaminated soil from within the six geographic areas that exhibits one or more RCRA characteristics. Additional details of this commitment and the procedures for its implementation are provided in Section 9.1.1. As a result of the commitment to identify and treat RCRA characteristic soil from the six designated geographic areas, no significant quantities of RCRA characteristic wastes from Operable Unit 5 are envisioned to be disposed of in the on-property disposal facility.

The Operable Unit 5 remediation waste that is destined for on-property disposal may contain these listed RCRA constituents (shown with their waste codes): methylene chloride (F002), tetrachloroethylene (F002), toluene (F005), trichloroethylene (F002), 1,1,1-trichloroethane (F002), and xylene (F003). Under the provisions of the CAMU rule, these constituents will not be placed in the on-property disposal facility at concentration levels that exceed the health-protective waste acceptance criteria levels established for each constituent. Materials that are contaminated above the waste acceptance criteria for the listed constituents will either be 1) treated to meet the criteria or 2) shipped off site for disposal."

Strike the text on pg. 9-29, lines 1-6 as it is no longer necessary.

13. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 9.1.2 Pg.#: 9-6 Line#: 3-6 Code:
 Original Specific Comment# 2
 Comment: The text states that perched water from the sewage treatment plant area and the fire training area will be segregated and pretreated, if necessary, to address RCRA- listed constituents. It is unclear why this approach is being used only for these two areas. This approach should be used for all perched water at FEMP, especially in the production plant area where RCRA-listed organics are present at high levels in perched water. The ROD should be revised accordingly.
 Response: The approach to addressing the treatment of perched water evolved during the negotiation of the pending OEPA's Director's Findings and Orders. This Director's Findings and Orders is focused upon the integration of the closure process for regulated RCRA units with response obligations under CERCLA and the Consent Agreement. During these negotiations, available data was reviewed to help establish whether identifiable contaminant plumes attributable to releases of hazardous waste or hazardous waste constituents from the regulated RCRA units at the site could be distinguished from areas of similar contamination attributable to de minimis process losses occurring over the 37-year production history of the plant. Such regions of elevated concentrations of hazardous waste or hazardous waste constituents could not be distinguished from other areas of elevated concentrations within the former production area.

Clearly defined sources of releases of listed hazardous waste and hazardous constituents could be identified at the fire training area and the sludge drying beds due to their location away from the main Production Area. It was agreed during these negotiations with the State of Ohio that the perched water encountered during excavation activities at these two locations would be segregated and pretreated to address the listed components before being blended with the other wastewater streams at the FEMP. On the basis of available groundwater sampling data, the constituents of concern at these locations are

low concentrations of volatile organics. Pretreatment will involve processing the water through carbon absorption columns prior to release to the advanced wastewater treatment (AWWT) facility. Purge water from groundwater sampling activities in these areas are currently drummed and pretreated at the VOC treatment system located in Plant 8. It is anticipated that a small pretreatment system will be installed at the AWWT facility as part of the planned expansion of the plant capacity. Flows containing listed constituents from the fire training area and the sludge drying beds are being preferentially segregated and pretreated so as to eliminate the need to invoke the procedural requirements of the State of Ohio hazardous waste regulations (which would be imposed for all AWWT residuals if the wastewater streams were commingled).

Perched water encountered during excavation activities in other areas will be directed to the 400 gpm system of the AWWT facility. Within this system flows are routed through flocculation/clarification, carbon absorption, and ion exchange before release to the Great Miami River. Thus, treatment is provided for these streams, but a separate pre-treatment step (like that required for the fire training area and sludge drying beds) is unnecessary. Please see the Response for Comment 45 for a related issue raised by OEPA.

Action: Add the following to page 9-6, line 3: ...transferred to the AWWT facility for treatment before discharge. Collected perched water containing volatile organic compounds will be directed through a carbon absorption treatment system (or equivalent) located at the AWWT facility. Perched water collected...

14. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 9.1.2 Pg.#: 9-6 Line#: 13-15 Code:
 Original Specific Comment# 3

Comment: The text states that limited pumping or trenching of perched water may be required to attain necessary remediation levels. However, no perched water remediation levels are presented in the ROD. The ROD should identify the remediation levels for perched water.

Response: The hydraulic extraction methods (pumping and/or trenching) were included in the draft ROD in case such methods might be needed to remediate the perched system (i.e., to achieve the cross-media soil cleanup goals referenced in Comment 11), in the unlikely event that excavation is not found to be technically implementable in all required areas to all prescribed depths. In essence, the hydraulic extraction methods were included as a "fall-back" remedial option if the preferred approach (excavation) ran into unforeseen implementability problems. Excavation is clearly the preferred approach and DOE is committed to its implementation; however, it was felt that a fall-back option should be mentioned in the ROD to address unlikely (but potentially possible) events that can be envisioned at this time. If for some reason the "fall-back" option of hydraulic extraction is required, DOE recognizes it would still be obligated to pursue the same cleanup standard as for excavation: cleanup of all soil and perched groundwater to satisfy cross-media concerns. Therefore, the remediation levels in this situation are identical to those for excavation, and are embodied in the soil cleanup levels listed in the ROD.

Action: None required.

15. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 9.1.5 Pg.#: 9-10 & 9-11 Line#: Code:
 Original Specific Comment# 4

Comment: Section 9.1.5 discusses treatment of discharges to the Great Miami River. The following items should be added to Section 9.1.5: (1) the agreed-upon discharge

concentration limit and (2) an explanation of the process of instituting reporting and corrective measures in the event that discharge limits both concentration- and mass-based are exceeded.

Response: Section 9 has been updated to reflect the resolution of the 20 ppb issue raised by EPA and OEPA.

Action: See actions addressing Comments 9 and 19.

16. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 9.1.8 Pg.#: 9-15 Line#: Code:
Original Specific Comment# 5

Comment: Section 9.1.8 describes the designation of the FEMP site as a CAMU. The text states that ignitable, reactive, and corrosive characteristic hazardous wastes will not be disposed of in the CAMU. The text should specify the types of listed and toxic characteristic hazardous wastes that may be disposed of in the CAMU.

Response: See Response for Comment 12.

Action: See Action for Comment 12.

17. Commenting Organization: U.S. EPA Commentor: Barwick
Section#: 9 Pg.#: 9-15 Line#: 27-31 Code:
Original Comment# 7

Comment: Page 9-15, lines 27-31. Why are the clean-up costs based upon a projected soil cleanup period of 22 years instead of the accelerated 10 year schedule recently endorsed by U.S. DOE Headquarters?

Response: The clean-up costs portrayed in the ROD are consistent with the Proposed Plan and the detailed cost estimates provided in the Operable Unit 5 Feasibility Study. The cost estimates for the various alternatives were first developed in mid-1994 and provided in the draft Feasibility Study in November 1994. These costs were based upon the planning and budgeting available at that time. The cost estimates portrayed in the ROD and the Feasibility Study are within the range of accuracy necessary to support the RI/FS decision process. Detailed cost estimates are presently being developed for the accelerated 10-year cleanup program to support the federal budgetary process. These estimates will continue to be refined throughout the remedial design process.

Action: None required. Please see the Response and Action for Comment 40.

18. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 9.2 Pg.#: 9-28 Line#: 26-33 Code:
Original Specific Comment# 6

Comment: Section 9.2 discusses remedial action objectives and cleanup levels. The waste acceptance criteria for "RCRA organics" (assumed to be toxic characteristic RCRA hazardous organic waste) are not well defined. No numerical waste acceptance criteria exist for most of the RCRA-based contaminants in the waste acceptance criteria table (Table 9-6) in the ROD. The ROD proposes using hand-held instruments to identify the presence of RCRA organics and proposes either (1) treating soil to meet site waste acceptance criteria and disposing of soil contaminated with RCRA organics on site or (2) treating the soil to meet LDR levels and disposing of the soil off site. The ROD should explain more fully the program for identifying and quantifying RCRA organics. The following items should be addressed: (1) the types of instruments that will be used to identify RCRA organics, (2) the levels of distinction among individual chemicals and the quantification levels that each instrument is capable of achieving, and (3) the levels of RCRA organics that will trigger on-site treatment and disposal or off-site treatment and disposal of contaminated soil.

Response: This comment is directly related to the concerns raised by OEPA in Comment 30. In

that comment, OEPA expressed a need for DOE to treat soil that contains RCRA-characteristic properties before disposal in the on-property disposal facility. As part of the resolution to Comment 30, DOE, EPA, and OEPA reached agreement on an implementation strategy for identifying and quantifying the RCRA-characteristic soil. New language has been added to Section 9.1.1 of the ROD to reflect the agreements reached. The additional text reflects the commitments made by DOE and denotes that the remedial design process will establish the specific analytical protocols required to comply with the implementation strategy. Also note that the response to Comment 25 provides additional information on the development of waste acceptance criteria for the RCRA COCs.

Action: Please see the actions identified in Comment 30 and the clarifications provided in Comment 25.

19. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 9 & 11 Pg.#: Line#: Code:
Original General Comment# 1

Comment: The draft OU5 ROD deviates significantly from the OU5 proposed plan. The ROD eliminates the 20 micrograms per liter ($\mu\text{g/L}$) of total uranium (U) maximum discharge limit for the blended effluent made up of treated and untreated groundwater and wastewater. The ROD retains (1) the maximum mass discharge limit of 600 pounds per year (lb/yr) of U and (2) the requirement that the in-stream U concentration in the Great Miami River must not exceed the 10^{-6} risk level of 530 $\mu\text{g/L}$ of U. The planned extraction rate for the groundwater remediation system is 4,000 gallons per minute (gpm). As discussed below, a maximum discharge concentration limit should be established.

Of the two requirements, the 600 lb/yr of U is predominant and makes the in-stream U requirement nearly meaningless. Based on a discharge rate of 4,000 gpm to the Great Miami River, the average U concentration of the effluent would need to be equal to or less than 34 $\mu\text{g/L}$ to meet the 600 lb/yr mass discharge limit. Regarding the second requirement for effluent discharge, effluent concentrations would need to be much greater than 530 $\mu\text{g/L}$ of U in order to exceed the allowable in-stream concentration because compliance with the in-stream requirement is monitored outside the mixing zone, allowing for effluent dilution by river water. The in-stream requirement appears to allow for discharge of relatively high concentrations of U. DOE proposes to monitor compliance with the 530- $\mu\text{g/L}$ in-stream limit based on the weekly average concentration.

The ROD does not specify how compliance with the mass discharge limit of 600 lb/yr of U will be determined. For U.S. EPA to ensure compliance with the mass discharge limit and ensure against undetected discharge of relatively high concentrations of U into the river, both the discharge flow volumes and the discharge U concentrations should be measured on a regular basis. According to the ROD and U.S. EPA-approved design, the groundwater extraction and treatment system must restore the groundwater to beneficial use in a reasonable time. The system described in the ROD extracts groundwater at a rate of 4,000 gpm. Taken together, the mass discharge limit and the required restoration rate make it possible to calculate a discharge concentration limit. An average discharge concentration limit should be established that allows for fluctuations in discharge flow rates and U concentrations while ensuring against discharges of relatively high concentrations of U. The average discharge concentration limit should then become an enforceable performance standard in the ROD. The ROD should also be revised to state that the general restoration timeframe of 27 years or less

(as modeled in the FS) in order to establish a performance standard for the groundwater extraction and treatment system. In addition, a monitoring program should be established that requires DOE to measure both flow rates and U concentrations with a 24-hour continuous composite sampler so that compliance with both the mass discharge limit and the discharge concentration limit can be analyzed daily.

The following information will be required for U.S. EPA, the Ohio Environmental Protection Agency (OEPA), and DOE to agree on a discharge concentration limit:

1. A description of all waters that are ultimately discharged to the river. This description should include the source, flow rate, concentration and location of measurement of the effluent. This description should also specify the current discharge sources and discuss how and when this will change in the future.
2. A description of the current and proposed treatment methods associated with all sources
3. A description of the treatment units (with cost estimates) potentially needed to meet the 20- $\mu\text{g}/\text{L}$ concentration limit

Response: Discussions were held between representatives of EPA, OEPA and DOE on September 5, 1995 about the need for a concentration-based discharge limit for uranium. At this meeting DOE provided the agencies with handouts containing the above-requested information. A copy of these handouts is provided as part of this comment response package. The handouts included the following information:

- Characterization (with regard to average flows and uranium concentrations) of all existing and projected wastewater streams contributing to the combined FEMP discharges to the Great Miami River. These flow streams are characterized for three discrete time segments related to the available treatment capacity at the site.
- A timeline of the projected FEMP treatment capacity available to address groundwater considering all existing and planned site treatment systems.
- A brief narrative describing the treatment systems and their available/projected capacities.
- Modeling projections of the expected effluent concentrations and annualized mass discharge rates for uranium for a number of groundwater extraction/reinjection scenarios.

In general these projections indicated that, for the groundwater extraction/reinjection scenarios evaluated, a 20 ppb concentration limit and a 600 pound annual mass limit for uranium could be attained under average operating conditions. DOE projected that continuous attainment with these limits could not be assured for periods of exceptional operating conditions.

Discussions at the meeting centered on the basis for imposing a 20 ppb total uranium discharge limit as a provision of the ROD. It was recognized that the application of such a limit was not being considered as a required component of the remedy necessary to ensure protectiveness. EPA considered such a limit an appropriate performance-based requirement that appeared to be reasonably attainable for all groundwater extraction/reinjection scenarios presently under consideration through the application of

a demonstrated wastewater treatment technology at a sensible level. At this meeting it was recognized that such a limit, being performance-based, would need to accommodate the exceptional operating conditions reasonably anticipated to occur over the duration of the remedial action.

In consideration of EPA's and OEPA's desire for such a concentration-based limit to be applied as part of the remedy, DOE agrees to adopt such a limit coupled with the following modifying considerations:

- The 20 ppb total uranium discharge limit will apply to the blended effluent entering the Great Miami River and be based upon a monthly average discharge concentration.
- The 600 pound per year mass discharge limit for total uranium will become effective upon issuance of the Operable Unit 5 ROD.
- The 20 ppb total uranium discharge limit will become effective on January 1, 1998.
- The FEMP will be allowed to by-pass storm water directly from the retention basin to the river for up to 10 days per year to accommodate periods of significant precipitation. The intent of allowing these direct by-passes to occur is to provide the relief needed to accommodate periods of precipitation that exceed retention and treatment capacities. The uranium concentration in the blended discharge during these 10 days will be considered in the 600 pound per year mass-based limit, but will not be included in the monthly averaging for purposes of demonstrating compliance with the 20 ppb concentration-based limit. Uranium concentrations in the effluent discharged to the river for these 10 days will not permit exceedance of the final remediation level (530 ppb total uranium outside the mixing zone) for the river. Notification will be provided to EPA and OEPA within seven days of the implementation of such a by-pass.
- The FEMP will be allowed periods of significantly reduced treatment plant operation to accommodate scheduled maintenance activities. The uranium concentration in the blended discharge during these periods will be considered in the 600 pound per year mass-based limit. EPA approval will be obtained in advance when notification of these planned maintenance periods is accompanied by a request to not include the uranium concentration in the discharge in the monthly averaging conducted for demonstrating compliance with the 20 ppb limit.

As part of this negotiated position, DOE has committed to expanding the design capacity of the existing AWWT facility by a minimum of 1800 gpm. Schedules for designing and constructing this additional treatment capacity will be defined as part of the RD/RA process.

Compliance with the mass- and concentration-based discharge limits will be assessed through use of the continuous NPDES sampling station located at the Parshall flume. The requested reference to the 27-year groundwater restoration time frame appears on pg. 9-9, line 7.

Action: To reflect this position in the ROD:

- 1) Add the following text on pg. D-ii, line 23 of the Declaration Statement:

...to attain "performance-based concentration discharge limits," mass-based discharge limits,...

- 2) Modify the text on pg. 9-10, lines 24 and 25:

"Additionally, treatment will be applied such that the total mass and blended effluent concentration of uranium discharged to the Great Miami River does not exceed 600 pounds per year or 20 ppb, as further defined below."

- 3) Delete the text on pg. 8-11, lines 1 through 9.

- 4) Add the following text on pg. 9-10, line 29:

"Treatment will be applied to storm water, wastewater and recovered groundwater to the extent necessary to limit the total mass of uranium discharged through the FEMP outfall to the Great Miami River to 600 pounds per year and to ensure that the levels necessary to ensure the protection of human health (i.e., 530 ppb total uranium outside the mixing zone) for concentrations of uranium and other COCs in the Great Miami River are not exceeded. This mass-based discharge limit will become effective upon issuance of the ROD. Additionally, the necessary treatment will be applied to these streams to limit the concentration of total uranium in the blended effluent to the Great Miami River to 20 ppb. The 20 ppb discharge limit has been adopted as a performance-based requirement of the selected remedy as it is considered reasonably attainable with the application of a sensible and cost-effective level of treatment. The 20 ppb discharge limit for uranium will be based on a monthly average and will become effective January 1, 1998.

The FEMP will be allowed to by-pass storm water directly from the site's storm water retention basin to the river for up to 10 days per year to accommodate periods of significant precipitation. The intent of allowing the by-pass of these flows is to provide the relief needed during periods of excessive precipitation when the quantities of storm water exceed retention and treatment capacities. The uranium concentration in the blended discharge during these 10 days will be considered in the 600 pound per year mass-based limit, but will not be included in the monthly averaging for purposes of demonstrating compliance with the 20 ppb performance-based concentration limit. Uranium concentrations in the effluent discharged to the river for these 10 days will not permit an exceedance of the final remediation level (530 ppb total uranium outside the mixing zone) for the river. Notification will be provided to EPA and OEPA within seven days of the implementation of such a direct by-pass.

Additionally, needed relief from the discharge limits will be provided to the FEMP to accommodate scheduled treatment plant maintenance activities. The uranium concentration in the blended discharge during these periods will be considered in the 600 pound per year mass-based limit. EPA approval will be obtained in advance when notification of these planned maintenance periods is accompanied by a request that the uranium concentrations in the discharge not be

considered in the monthly averaging performed to demonstrate compliance with the 20 ppb limit.

To attain these mass-based and concentration-based discharge limits, DOE has committed to expanding the design capacity of the existing AWWT facility by a minimum of 1800 gpm. Schedules for designing and constructing this additional treatment capacity will be defined as part of the RD/RA process."

- 5) Add the following text on pg. 9-11, line 9:

... exceed 600 pounds. "The 600 pound per year discharge limit for uranium will become effective upon issuance of the ROD."

- 6) Add the following text on pg. 9-11, line 10:

"Treatment of the necessary wastewater, storm water and groundwater to ensure that the maximum concentration of total uranium in the blended effluent discharged to the Great Miami River does not exceed 20 ppb, based upon a monthly average concentration. This limit will become effective January 1, 1998."

- 7) Modify the text on pg. 9-11, line 12:

... Building 51. "This expansion will have a minimum design capacity of 1800 gpm." Utilization of...

- 8) Delete the text on pg. 10-14, lines 4 through 15.

- 9) Delete Section 11.0 in its entirety.

- 10) Delete the following text from pg. A.2-4:

... "As a result of public comments remedy description in Section 9.0."

Replace with the following:

... "No significant changes were made to the selected remedy described in the Proposed Plan as a result of public comments."

- 11) Replace the response to the comment by Anon. 6 in Appendix A with the following:

DOE, EPA and OEPA consider it prudent to continue to strive for reduction of uranium discharges to the Great Miami River. In 1989, the year production ceased at the FEMP, uranium discharges to the Great Miami River were approximately 1800 pounds per year. Through the construction of the storm water retention basin, the installation and operation of two temporary treatment units, and the construction and operation of the advanced wastewater treatment system, uranium discharges to the river have gradually decreased. The current year's projected discharge is anticipated to be less than 600 pounds. As full-scale aquifer restoration begins, it would be reasonably expected that the quantity of water and the mass of uranium being discharged to the river will

increase. Meetings were held with the EPA and OEPA regarding the need and advisability of imposing a performance-based concentration discharge limit as part of the ROD. A performance-based concentration limit that could be reasonably attained with a cost-effective level of treatment was considered necessary by EPA to supplement the human health-based final remediation level of 530 ppb established for concentrations of total uranium in the Great Miami River.

Modeling was performed by DOE to assess the cost and technical implications of adopting a 20 ppb total uranium discharge limit. This modeling led to the conclusion that, for the groundwater extraction/reinjection scenarios presently under consideration for the Great Miami Aquifer, the 20 ppb discharge limit could be attained under average operating conditions with the use of existing or proposed site treatment capacity. The modeling identified that the actual application of such a limit would need to accommodate unusual operating conditions.

It was agreed, as identified in Section 9.1.5, that 20 ppb total uranium would be adopted as a reasonable, performance-based concentration discharge limit with the incorporation of provisions to accommodate unusual operating conditions.

20. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 10.1.2 Pg.#: 10-3 Line#: 19-24 Code:
 Original Specific Comment# 7
 Comment: The text states that perched groundwater zones with contaminant concentrations above levels protective of the underlying Great Miami Aquifer will be excavated concurrently with contaminated soils. The ROD should specify each of these levels as concentrations and should identify these zones on a map.
 Response: See the response for Comments 11 and 14 for additional background information related to this topic.
 Action: For clarification, modify the sentence on page 10-3, line 24 to read: "...requiring action reside on property and are accounted for in the excavation footprints for soil. The cleanup levels established for soil take into account cross-media pathways of exposure through the perched groundwater system and will be used to confirm that the perched groundwater zones that pose an unacceptable risk to the underlying Great Miami Aquifer are successfully remediated."
21. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 10.1.4 Pg.#: 10-5 Line#: 1 & 2 Code:
 Original Specific Comment# 8
 Comment: These lines discuss the performance standards for the advanced wastewater treatment plant after any blending of discharge. A typographical error needs to be corrected by changing the phrase "will be exceeded" to "will not be exceeded." In addition, the text should be revised to specify the discharge concentration limit to be met.
 Response: Agree.
 Action: Revise phrase on pg. 10-5, line 1 to read: ...will not exceed 600 pounds per year and a monthly average discharge limit of 20 ppb (as stipulated in Section 9.1.5), and in-stream final remediation levels of 530 ppb will not be exceeded. Although a health-protective limit (530 ppb total uranium measured outside the mixing zone) was established, the total uranium discharge limit (20 ppb measured at the outfall to the Great Miami River) has been adopted as a performance-based requirement because it is considered attainable with the existing and planned modifications to the FEMP's advanced wastewater treatment facility.

22. Commenting Organization: U.S. EPA Commentor: Barwick
 Section#: 10 Pg.#: 10-5 Line#: 2 Code:
 Original Comment# 8
 Comment: Page 10-5, line 2. At a minimum, the second "be" is a typographical error. More substantively, this should read "will not be exceeded."
 Response: Agree.
 Action: Correction accomplished with text revisions for Comment 21.

23. Commenting Organization: U.S. EPA Commentor: Barwick
 Section#: 10 Pg.#: 10-5 Line#: 32 Code:
 Original Comment# 9
 Comment: Page 10-5, line 32. Pursuant to 40 CFR § 300.430(f)(4)(iii)(A), U.S. DOE and U.S. EPA are making a joint remedy selection. Therefore, "grants" should be "concur with." Other, similar, statements throughout the ROD should also be clarified (e.g., see page 10-7, lines 4-12 and page 10-11, line 22).
 Response: Agree in part. DOE will make the suggested changes on pg. 10-5 and pg. 10-11; however, the referenced language on pg. 10-7 is consistent with the EPA-approved language from the Operable Unit 2 ROD. EPA and OEPA have made it clear in other comments (24, 31, 51, 52, 53, 54) that it is not acceptable for DOE to deviate from the approved Operable Unit 2 language regarding the siting criteria waiver.
 Action: Change pg. 10-5, line 32 to read: EPA grants the waiver and concurs with DOE that the selected remedy... Pg. 10-7, lines 4-12: No change other than to incorporate additional Operable Unit 2 language. Change pg. 10-11, line 22 to read: EPA and DOE have determined....

24. Commenting Organization: U.S. EPA Commentor: Barwick
 Section#: 10.2.2 Pg.#: 10-7 thru 10-10 Line#: Code:
 Original Comment# 10
 Comment: Pages 10-7 through 10-10 (Section 10.2.2.) There is language in the OU 2 ROD which discusses the waiver issue in a manner satisfactory to the regulatory agencies and which has passed through public comment. Why then has DOE attempted to re-write this section? DOE should replace this section with the OU 2 waiver discussion. In addition, it should be made clear that this ROD in no way re-opens the waivers for on-site disposal of OUs 2, 3, and 4 waste but instead concerns only OU 5 waste.
 Response: Since the changes that DOE made to Section 10.2.2 were largely editorial rather than a rewrite, as indicated by this comment, DOE agrees to revise Sections 10.2.1 and 10.2.2 to reflect the approved Operable Unit 2 language (Section 10.2.3 of the Operable Unit 2 ROD) related to the siting criteria waiver. The revision to the 2nd to last paragraph in Section 10.2.2 addresses the commentor's concern regarding reopening waivers for on-property disposal of wastes from other FEMP operable units.
 Action: Revise Sections 10.2.1 and 10.2.2 to reflect the approved Operable Unit 2 ROD language on the siting criteria waiver (Operable Unit 2 ROD Section 10.2.3). Where Operable Unit 5-specific language is required (e.g., Operable Unit 5 has consistently used "property" and "site" as they are defined in the Amended Consent Agreement throughout their RI/FS documents), the approved Operable Unit 2 language is included and struckout to highlight what was deleted and replaced with Operable Unit 5-specific language. Redlined text indicates a change to exact Operable Unit 2 language in response to the comment number shown in the margin. Due to the nature of the changes/comment responses throughout Sections 10.2.1 and 10.2.2, the full text is not included here.

25. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 10.4 Pg. #: 10-12 Line#: 11-15 Code:
Original Specific Comment# 9

Comment: This paragraph states that soil contaminated with RCRA-regulated contaminants will be treated to meet LDR requirements for off-site disposal or waste acceptance criteria for on-site disposal, thus providing significant reductions in the toxicity, mobility, or volume of contaminants. The significance of these reductions appears to be overstated considering (1) the relatively small volume of soil contaminated with RCRA-regulated contaminants and (2) the fact that no numerical waste acceptance criteria exist for most of the RCRA-based contaminants in the waste acceptance criteria table (Table 9-6) of the ROD. The text should be revised to quantify the significance of the reductions or to remove the claim from the ROD.

Response: A nearly identical issue was raised by OEPA. See responses to Comments 30 and 55 and the DOE commitments provided for Comment 30. DOE also wishes to clarify that all of the RCRA-based contaminants of concern were subjected to the waste acceptance criteria 1000-year performance period modeling process, and the absence of a numerical value in Table 9-6 should not be construed to imply that "no numerical waste acceptance criteria exist," as suggested by the comment. Rather, the absence of a numerical value for a RCRA contaminant in Table 9-6 indicates, based on mobility behavior and geochemical properties, that these particular contaminants will not impact the Great Miami Aquifer above prescribed levels within the 1000-year simulation period, regardless of initial concentration in the facility. In accordance with OEPA's request expressed during the negotiations for the draft RCRA/CERCLA integration Directors Findings and Orders, none of the RCRA COCs were "screened out" during either the establishment of final remediation levels or the development of waste acceptance criteria for the various on-property alternatives considered in the Operable Unit 5 feasibility study. In keeping with this arrangement, all of the RCRA COCs appear in Table 9-6, even if select constituents do not require an upper-bound concentration limit for placement of that constituent in the on-property disposal facility.

Action: As stated for Comments 30 and 55.

26. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 11 Pg. #: 11-1 thru 11-3 Line#: Code:
Original Specific Comment# 10

Comment: This section provides the rationale for two significant changes made to the proposed remedy since issuance of the proposed plan. The first change relates to deletion of a discharge concentration limit. Although DOE presents a technically sound rationale for not using 20 µg/L as the discharge concentration limit, it does not present any arguments for eliminating the requirement for a discharge concentration limit. This section should be revised to present a new discharge concentration limit (see General Comment 1) that accommodates (1) the mass discharge limit, (2) the groundwater restoration timeframe and the resulting discharge rate from the advanced wastewater treatment system, and (3) the surface water remediation levels.

Response: Section 11 will be eliminated from the ROD as a result of the successful resolution of all outstanding issues. See response to Comment 19.

Action: Delete Section 11 in its entirety because there are no significant changes from the preferred remedy described in the Proposed Plan.

27. Commenting Organization: U.S. EPA Commentor: Barwick
Section#: A.3 Pg.#: A.3-138 Line#: Code:
Original Comment# 12
Comment: A.3-138, Yocum, E. 6. The 20 parts per billion final remediation level for the Great Miami Aquifer is not a goal but an enforceable element of this ROD.
Response: Agree.
Action: Replace "goals" with "limits" in the response to E. Yocum 6. Similar changes will be made to the response to Anon. 4-1, L. Crawford 12, V. Dastillung 12, P. Dunn 5, OEPA 3, and G. Willeke 1.
28. Commenting Organization: U.S. EPA Commentor: Barwick
Section#: R Pg.#: R1-R3 Line#: Code:
Original Comment# 11
Comment: Pages R1-R3. Are all of these documents in the administrative record?
Response: Approximately 98 percent are in the administrative record now; the remaining 2 percent will be submitted by the time the ROD is signed.
Action: Ensure that all reference documents are in the administrative record file for Operable Unit 5 before ROD signing.

**COMMENT CROSS-REFERENCE LIST FOR EPA COMMENTS
ON THE AUGUST 1995 OPERABLE UNIT 5 ROD**

7262

DOE No.	Commenting Organization	Commentor	Original Comment No.	Section	Original Page No.	Line No.	New Page No.
29	OEPA	OFFO	General 1				D-ii
30	OEPA	OFFO	General 2				D-ii, 9-6, 10-13
31	OEPA	OFFO	General 3				10-6, 10-8
32	OEPA	OFFO	General 4				9-17
33	OEPA	OFFO	General 5				G
34	OEPA	OFFO	Specific 6	Declaration	D-ii	1st bullet	D-ii
35	OEPA	OFFO	Specific 7	Declaration	D-iii	1-8	D-iii
36	OEPA	OFFO	Specific 8	1	1-10	6,7	1-10
37	OEPA	OFFO	Specific 9	3.0	3-2	17-25	3-2
38	OEPA	OFFO	Specific 10	3.0	3-3		3-3
39	OEPA	OFFO	Specific 11	3.0	3-3		3-1
40	OEPA	OFFO	Specific 12	4	4-1	14	4-3
41	OEPA	OFFO	Specific 13	4.0	4-3	4-10	4-3
42	OEPA	OFFO	Specific 14	4.0	4-3		NA
43	OEPA	OFFO	Specific 15	5	5-1	5-1	NA
44	OEPA	OFFO	Specific 16	9	9-1	17,18	9-1
45	OEPA	OFFO	Specific 17	9	9-6	5,6	9-8
46	OEPA	OFFO	Specific 18	9.1.7	9-13	11-14	9-17
47	OEPA	OFFO	Specific 19	9.1.7	9-14	10-12	NA
48	OEPA	OFFO	Specific 20	9.1.9	9-15		NA
49	OEPA	OFFO	Specific 21	Table 9-1	9-16	1-12	9-21
50	OEPA	OFFO	Specific 22	10.1.4	10-5	2	10-5
51	OEPA	OFFO	Specific 23	10.2.1	10-7	4-12	10-7
52	OEPA	OFFO	Specific 24	10.2.2	10-8	16-18	10-9
53	OEPA	OFFO	Specific 25	10.2.2	10-9	26	10-10
54	OEPA	OFFO	Specific 26	10.2.2	10-10	14-21	10-11
55	OEPA	OFFO	Specific 27	10.4	10-12	11-12	10-13
56	OEPA	OFFO	Specific 28	10.4	10-12	18	10-13
57	OEPA	OFFO	Specific 29	10	10-13	25	10-15
58	OEPA	OFFO	Specific 30	10	10-14	10-13	10-15
59	OEPA	OFFO	Specific 31	10.6	10-15		NA
60	OEPA	OFFO	Specific 32	10	10-15	17	10-16
61	OEPA	OFFO	Specific 33	A.1.2	A.1-2	12-14	A.1-2
62	OEPA	OFFO	Specific 34	A.2.1	A.2-2	1-2	A.2-2
63	OEPA	OFFO	Specific 35	A.3.0	A.3-28		NA
64	OEPA	OFFO	Specific 36	A.3.0	A.3-70	Dunn, P.6	In alphabetical order
65	OEPA	OFFO	Specific 37	A.3.0	A.3-94	Renck, T.E. 2	In alphabetical order

**COMMENT CROSS-REFERENCE LIST FOR EPA COMMENTS
ON THE AUGUST 1995 OPERABLE UNIT 5 ROD**

7262

DOE No.	Commenting Organization	Commentor	Original Comment No.	Section	Original Page No.	Line No.	New Page No.*
66	OEPA	OFFO	Specific 38	A.3.0	A.3-96	Renck, T.E.5, Response 2nd par	In alphabetical order
67	OEPA	OFFO	Specific 39	A.3.0	A.3-97	Renck TE6 Response 2nd para	In alphabetical order
68	OEPA	OFFO	Specific 40	A.3.0	A.3-116	Schulte, A 3, Response	In alphabetical order
69	OEPA	OFFO	Specific 41	A.3.0	A.-116	Schulte, A 3, Response	In alphabetical order
70	OEPA	OFFO	Specific 42	A.4.0	A.4-1	24-26	A.4-1
71	OEPA	OFFO	Specific 43	A.4.0	A.4-1		A.4-2
72	OEPA	OFFO	Specific 44	Appendix B			Table B.3, B.4A, B.4.B, B.4.C
73	OEPA	Schneider	1 - Submitted Late	10.6	10-15 & -16		NA

*G means the change is applied to all appropriate places in the ROD
NA means a no-action response

000 22

or volume of wastes that will remain in place after closure of the CAMU; as cited in the preamble for the CAMU rule, this decision step is analogous to the preference under CERCLA for treatment-based remedies.

Recognizing that DOE has developed health-protective final remediation levels and numerical waste acceptance criteria for all of the Operable Unit 5 COCs (including the RCRA COCs, thereby satisfying decision steps 1 and 2 above), OEPA's stipulation requiring the treatment of the Operable Unit 5 soil that qualifies as characteristic waste is acknowledged by DOE to have its origin in satisfying the preference for treatment in decision step 3. As stated in the preamble to the CAMU rule, the decision to apply cost-effective treatment at a site is a case-by-case decision that must consider waste- and site-specific factors. Upon review of the site characterization data from the Operable Unit 5 remedial investigation coupled with historical process knowledge, six geographic areas of the FEMP have been identified where a reasonable potential exists for the presence of soil that qualifies as RCRA characteristic waste. These areas are summarized on a new table that will be added to the ROD (and is included under the Action for this comment). Recognizing that a protective remedy has been selected for the Operable Unit 5 soil, coupled with the desire on the part of DOE, EPA and OEPA to satisfy the statutory preference for treatment, consensus has been reached that these six geographic areas define the boundaries within which additional efforts will be made to identify and segregate for treatment (if needed) the soil that qualifies as RCRA characteristic waste. Within these geographic areas, as soil is excavated based on exceedances of final remediation levels, follow-up analytical testing will be performed to determine if the soil demonstrates a RCRA characteristic. If the soil does not demonstrate a RCRA characteristic and it meets the on-property numerical waste acceptance criteria it will be placed in the disposal facility. If the representative volume of the soil in question demonstrates a RCRA characteristic it will be preferentially segregated for treatment before disposition either on or off site.

As part of the consensus DOE, EPA, and OEPA agree that sufficient existing data and historical process knowledge are available to identify the boundaries of the six geographic areas as those that represent a reasonable opportunity for cost-effective soil treatment. Outside of these geographic areas, DOE, EPA, and OEPA all concur that there is no reasonable basis to conclude that an increased potential for the presence of RCRA characteristic waste exists that would provide additional opportunity for cost-effective soil treatment. Therefore, outside the boundaries of the six geographic areas, no additional analytical data will be required to screen for the presence of characteristic waste before placement in the disposal facility. In the event that additional toxicity characteristic leaching procedure data are generated for other purposes from outside the boundaries of the six geographic areas (for example, to assess the compliance characteristics of soil destined for off-site disposal), these data will not be used to challenge the existing agreements concerning the reasonableness of the six geographic areas that have been designated to satisfy the intentions of Section 264.552 of the corrective action management unit rule.

A description of this overall approach, the treatment technique to be applied to the segregated materials, and the use of the toxicity characteristic leaching procedure (TCLP) to guide the identification of the material for preferential treatment has been added to Section 9 of the ROD. The various responses concerning this issue that appear in the Responsiveness Summary have also been revised to reflect this commitment on the behalf of DOE. It should also be emphasized that the Operable Unit 5 remedy already adopted a screening mechanism (using hand-held organic vapor analyzers) to

identify RCRA organic contaminants at levels that could jeopardize the integrity of the earthen liners that are built into the on-property disposal facility. This screening mechanism will remain in effect in addition to the commitment on behalf of DOE to track and treat RCRA characteristic waste from within the six geographic areas. To reinforce the visibility of this screening mechanism, additional language has been added to the remedy description in Section 9.0 of the ROD that more fully describes this approach.

At the October 26, 1995 ROD comment resolution meeting, OEPA requested that DOE provide the rationale for the identification of the six geographic areas within the document. It was agreed that the best location for the rationale was in the response to OEPA's comments in the Responsiveness Summary.

Action: Revise Section 9.1.1 of the ROD to reflect DOE's commitment to the preferential treatment of Operable Unit 5 soil that qualifies as RCRA characteristic waste found within the six agreed-to geographic areas of the FEMP; include additional text in the Responsiveness Summary for OEPA's Comment 2c that provides the rationale for selection of the six areas. Add discussion to Section 9.1.1 concerning DOE's commitment to a screening technique to track RCRA organic constituents that may exist at concentration levels potentially detrimental to the earthen liners of the on-property disposal facility.

Add the following three bullets on pg. 9-4:

- Based on historical process knowledge and soil contaminant concentration levels identified through the Operable Unit 5 remedial investigation, six geographic areas of the FEMP have been identified where a reasonable potential exists for the presence of soil that qualifies as RCRA characteristic waste (see Table 9-1) and provides a reasonable opportunity for treatment. Within these six geographic areas, additional efforts will be made to identify and segregate for treatment (as needed) the soil that qualifies as RCRA characteristic waste. As soil is excavated from within these areas based upon exceedances of final remediation levels, follow-up analytical testing will be performed to determine if the soil demonstrates a RCRA characteristic. If the soil does not demonstrate a RCRA characteristic and it satisfies the on-property numerical waste acceptance criteria it will be placed in the disposal facility. If a representative volume of the soil in question demonstrates a characteristic it will be preferentially segregated for treatment (to remove the characteristic property) before disposition either on or off site. DOE, EPA, and OEPA all agree that sufficient existing data and historical process knowledge are available to identify the boundaries of the six geographic areas as those that represent a reasonable opportunity for cost-effective soil treatment. Outside of these geographic areas, DOE, EPA, and OEPA all concur that there is no reasonable basis to conclude that an increased potential for the presence of RCRA characteristic waste exists that would provide additional opportunity for cost-effective soil treatment. Therefore, outside the boundaries of the six geographic areas, no additional analytical data will be required to screen for the presence of characteristic waste before placement in the disposal facility. In the event that additional TCLP data are generated for other purposes from outside the boundaries of the six geographic areas (for example, to assess the compliance characteristics of soil destined for off-site disposal), these data will not be used to challenge the existing agreements concerning the reasonableness of the six geographic areas that have been designated to satisfy the intentions of Section 264.552 of the corrective action management unit rule. Treatment is expected to involve EPA-approved stabilization technologies (for

inorganic constituents) or low temperature thermal destruction techniques (for organic constituents), as necessary. The EPA's TCLP will be used to guide the identification of material requiring treatment from within the boundaries of the six geographic areas. The remedial design effort will provide the details of 1) the statistical and testing protocols necessary to establish representative soil volumes requiring treatment; 2) the treatment processes to be employed; and 3) the procedures for verifying the treatment's effectiveness.

TABLE 9-1

**RCRA CHARACTERISTIC SOIL AREAS DESIGNATED FOR IDENTIFICATION,
SEGREGATION, AND TREATMENT**

Area Description	Justification
Inactive HWMUs to be Closed Under CERCLA:	
Abandoned sump west of pilot plant	Sump contents failed TCLP for metals. Barium exceeded the 20 times rule at a soil sample depth of 10-10.5 ft.
Non-HWMU Areas:	
Area between KC-2 warehouse and railroad tracks	Several samples showed surficial contamination for lead exceeding the 20 times rule.
Trap range	RI data showed that lead contamination from lead shot exceeds the 20 times rule.
Paddys Run streambank: fill material west of silos	RI data indicated that concentrations of the following constituents may exceed the 20 times rule: lead, nitrobenzene, hexachloroethane, hexachlorobutadiene, hexachlorobenzene, heptachlor, and heptachlor epoxide.
Scrap metal pile area	Surficial soil samples exceeded the 20 times rule for toxaphene, heptachlor, methoxychlor, heptachlor epoxide, endrin and lead.
Area north of maintenance building	Subsurface samples exceeded the 20 times rule for vinyl chloride, endrin, heptachlor, heptachlor epoxide, endrin, and lead.

*Areas for which RCRA characteristic testing and soil treatment (if needed) will be implemented to satisfy the requirements of Section 264.552 of the CAMU Rule. These areas were identified based on process knowledge and existing data obtained through the Operable Unit 5 remedial investigation.

- A best management approach will also be applied during all excavation activities to identify, segregate (and treat as necessary) soil containing concentrations of organic compounds at levels that potentially could jeopardize the integrity of the earthen liners that are built into the on-property disposal facility. To accomplish this objective, DOE will employ hand-held organic vapor analyzers during the excavation process to identify material exhibiting elevated concentrations of organic compounds. The materials so identified will be preferentially segregated and treated before on-property disposal. Treatment is expected to involve

EPA-approved low temperature thermal destruction techniques and the EPA's TCLP will be used as the benchmark for determining the extent of treatment necessary before disposal. The remedial design effort will outline the specific testing protocols for employing the hand-held organic vapor analyzers and verifying the effectiveness of treatment.

- In the event the Site Treatment Plan developed under the Federal Facilities Compliance Act identifies treatment technologies other than low temperature thermal destruction that may be appropriate for the treatment of organic compounds in soil, such alternate technologies will be considered and evaluated during remedial design.

Add following sentence to Declaration, pg. D-ii, line 15: Soil from six designated areas where a reasonable potential exists for the presence of characteristic waste (as defined by the Resource Conservation and Recovery Act) will be treated, as needed, before disposition.

31. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: Pg.#: Line#: Code: M
 Original Comment# 3

Comment: The draft ROD employs language throughout that differs to varying degrees from the approved OU2 ROD with regard to the solid waste siting criteria waiver. Such variations raise questions of intent and meaning. Ohio EPA believes it would be more expedient if in all cases possible, DOE would use the exact language from the OU2 ROD, thus limiting the need for substantial legal review and comment. In instances where DOE believes it is necessary to deviate from the OU2 language, Ohio EPA requests the Comment Response document justify those deviations. Since DOE has requested Ohio EPA clarify instances of inconsistencies in the RODs, we have attempted to comment on a number of such instances. Ohio EPA expects that following successful comment resolution the document will be revised in its entirety as appropriate.

Response: The solid waste siting criteria waiver language is located in three places in the Operable Unit 5 Draft ROD. These are the Declaration (p. D-iii), Section 7.0 (p. 7-15) and Section 10.0 (pgs. 10-6 through 10-10). The differences between the waiver language in the Operable Unit 5 ROD and the Operable Unit 2 ROD are largely editorial and therefore DOE has revised the waiver language found in the Operable Unit 5 ROD to reflect the exact language from the approved Operable Unit 2 ROD, to the maximum extent practicable, so as to limit the need for an extensive legal review by OEPA. In instances where the waiver language in the Operable Unit 5 ROD is different from the Operable Unit 2 ROD, DOE has struckout the Operable Unit 2 language to highlight where there are differences due to information or requirements that are specific to Operable Unit 5.

Action: See Action for Comment 24.

32. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: Pg.#: Line#: Code: M
 Original Comment# 4

Comment: The draft OU5 ROD defers a decision with regard to continued federal ownership of the FEMP to an unknown later date. The previously approved RODs for Operable Units 1, 2, & 4 either state the decision will be made in the OU5 ROD or in the case of OU2 states "This alternative will include continued federal ownership of the site with...". This appears to create a conflict which needs to be resolved within the OU5 ROD. The issue has been addressed both in public comments on the OU5 Proposed Plan and in the

Fernald Citizens Task Force recommendations. A number of the comments and the Task Force's recommendations seem to be at odds. In addition, it is unclear how DOE can ensure land use is maintained by simply applying deed restrictions at some point in the future. Such deed restrictions can be removed by future land owners and DOE would still retain a level of liability for ensuring protectiveness is maintained.

These issues point to the necessity to clearly define ownership within the OU5 ROD or determine a date when such a determination will be made. Such a determination should be made in a manner similar to that required for a ROD with regard to public involvement and enforceability.

Response: The language contained in the ROD in Section 9.1.7 was the subject of discussion between representatives of EPA, OEPA and DOE at a meeting on September 5, 1995. At the meeting it was agreed that the Operable Unit 5 ROD should not establish a firm commitment for continued federal ownership for the regions of the FEMP property located outside the disposal facility and associated buffer zone. It was agreed that the current ROD language would be expanded to more fully reference the resolutions of the Fernald Citizens Task Force, but would maintain consistency with these resolutions.

The Task Force resolutions regarding future use provided that:

- The areas of the FEMP containing the disposal facility and associated buffer zone remain under continued ownership of the federal government
- The remaining portions of the FEMP property be made available for uses that are most beneficial to the surrounding communities
- Any agricultural or residential uses of the FEMP property be prohibited.

The Task Force resolutions requested that the local citizenry be engaged before making any final land use decisions for the areas of the FEMP property outside the disposal facility. DOE considers this an appropriate recommendation. As discussed at the referenced meeting, a final land use plan for the FEMP property will be developed, with the participation of the local community, during the remedial design (RD) process. As part of this plan or as a separate RD deliverable, proposed institutional control measures to complement the final land use plan will be provided to EPA and OEPA for review and approval.

In the event that the final land use/grading plan and institutional control plan developed during the RD process and approved by EPA is inconsistent with the language in the Operable Unit 2 ROD, the appropriate actions would be undertaken to AMEND THE Operable Unit 2 ROD.

Action: Add the following paragraph at line 15 on page 9-13; the response to M. Clawson's public comment has also been revised to be consistent with this position.

The Fernald Citizens Task Force issued recommendations regarding future use of the FEMP property in May of 1995. The Task Force recommended that the area of the FEMP containing the disposal facility and associated buffer zone remain under the continued ownership of the federal government. Additionally, the Task Force recommended that the remaining portions of the FEMP property be made available for the uses that are deemed most beneficial to the surrounding communities. The Task Force encouraged DOE to consult with the local communities to establish their

selected will attain a standard of performance that is equivalent to that required under the otherwise applicable standard, requirement, criteria, or limitation, through the use of another method or approach." The justification for this waiver is provided in the Decision Summary of this record of decision and is supported by the administrative record for Operable Unit 5.

36. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 1 Pg. #: 1-10 Line#: 6,7 Code: C
 Original Comment# 8
 Comment: This statement doesn't mention whether or not the surveys confirmed the presence of these species. Please discuss the results of the survey.
 Response: The phrase was meant to indicate that DOE continues to monitor any and all threatened or endangered species; e.g., a survey for an endangered plant was conducted this past spring. While the ROD is not considered the appropriate venue for reporting on these studies, revised language will be provided.
 Action: Revise the paragraph beginning on line 4 to read:
 Surveys for seven threatened and endangered species have identified two species of concern at the FEMP site. The Paddys Run corridor represents excellent habitat for the federally endangered Indiana bat and the state threatened Sloan's crayfish inhabits portions of the creek. In order to protect all species, appropriate management practices and follow-up surveys will be implemented throughout site remediation.
37. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 3.0 Pg. #: 3-2 Line#: 17-25 Code: E
 Original Comment# 9
 Comment: Publication titles should be underlined or italicized.
 Response: Agree.
 Action: Italicize the names of the three newspapers mentioned in Section 3.0.
38. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 3.0 Pg. #: 3-3 Line#: Code: C
 Original Comment# 10
 Comment: The section should include the Ohio EPA availability session on the OU5 Proposed Plan held May 15, 1995 as well as the USEPA and Ohio EPA availability session on the disposal cell waiver held September 13, 1994.
 Response: A sentence describing the OEPA's May 15, 1995 meeting will be added on pg. 3-2, line 26. The other public meetings on the waiver topic will be discussed as part of the response to Comment 39.
 Action: Add the following at the end of the first sentence on line 26: On May 15 OEPA held an availability session in Ross for citizens who wanted to discuss Operable Unit 5's preferred alternative with representatives of the state.
39. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 3.0 Pg. #: 3-3 Line#: Code: C
 Original Comment# 11
 Comment: It would seem appropriate to include a discussion of the some of the OU2 actions as they relate to presenting the disposal cell concept to the public. These sessions have brought some of the more detailed aspects of on-site disposal to the public and should be included as community participation activities. In addition, a brief discussion of the Fernald Citizens Task Force sessions on disposal options should be included. All of this information will help clarify the number of opportunities provided for information sharing and public input to the process.

Response: Agree.

Action: Revise the preceding paragraph (on line 15) so that it now ends with this sentence: Presentations are regularly given at public workshops and range from providing information on the latest project designed to significantly reduce contamination to discussing the Operable Units 1 through 5 RI/FS reports.

Insert the following new paragraph: For example, Operable Unit 2 introduced its Proposed Plan and preferred remedial alternative, which included an on-property disposal facility, at a public workshop on June 28, 1994. The issue of the disposal facility generated a lot of attention that in turn generated several special availability sessions; OEPA sponsored one on September 13 followed by DOE on October 25. In all, OEPA, DOE and the Fernald Citizens Task Force provided seven opportunities in 1994 and 10 in 1995 for the public to participate in the decision-making process around this issue.

40. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 4 Pg.#: 4-1 Line#: 14 Code: C
 Original Comment# 12
 Comment: Please add a phrase to this sentence reflecting the duration of soil cleanup that is expected in the accelerated scenario.
 Response: Agree, but prefer to leave the discussion in this paragraph as is and add the updated material at the end of Section 4.0.
 Action: Add the following text at the end of Section 4.0, pg. 4-3: The DOE, in cooperation with the EPA, OEPA and local citizenry is actively pursuing budgeting support for an accelerated cleanup program for the FEMP. Under this accelerated program, remedial actions to address the contaminated soil at the FEMP could be completed within 10 years instead of 20-22; no change is anticipated in the time required for groundwater remediation.
41. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 4.0 Pg.#: 4-3 Line#: 4-10 Code: C
 Original Comment# 13
 Comment: Based upon current discussions regarding the appropriateness of an additional operable unit, it would seem prudent to not incorporate the referenced text in the ROD.
 Response: Agree.
 Action: Delete the text referenced in this comment.
42. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 4.0 Pg.#: 4-3 Line#: Code: C
 Original Comment# 14
 Comment: Previous RODs have reference NEPA activity within this section of the document. Is this omission based upon a recent change in DOE position with regard to NEPA implementation? Ohio EPA is simply seeking clarification in the comment response document not a change in the ROD.
 Response: Reviewer is correct. It was DOE's policy to integrate the procedural requirements of NEPA into the FEMP's CERCLA documents and this was carried out by Operable Units 4, 1 and 2. As Operable Unit 5 was preparing their RI and FS Reports, DOE's policy was changed by the Revised Secretarial Policy on NEPA, issued June 13, 1994; the designation of environmental assessment was dropped from Operable Unit 5 documents and only the substantive aspects of NEPA were incorporated.
 Action: None.

43. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 5 Pg.#: 5-3 Line#: 5-1 Code: C
 Original Comment# 15
 Comment: It has recently been determined that Tc-99 is a critical driver in OU3. Because they are proposing a mass-based WAC for that OU, please add summary statistics for that contaminant to this Table.
 Response: Agree in part. DOE agrees that Tc-99 is a critical driver for Operable Unit 3. The table (Table 5-1) that is the subject of this comment depicts predominant Operable Unit 5 soil contaminants. Based on the comprehensive evaluation of soil contamination in the Operable Unit 5 RI Report, DOE does not consider Tc-99 a predominant contaminant in FEMP soil, and therefore it should not be included in the table.
 Action: None required.
44. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 9 Pg.#: 9-1 Line#: 17,18 Code: C
 Original Comment# 16
 Comment: This should be clarified to describe the difference between minor field changes and major changes to the scope of this ROD. It should be explicitly stated that major changes require an amendment to the ROD.
 Response: The language contained in the ROD is consistent with EPA guidance on preparing Superfund decision documents. Additional text will be added to more fully describe the procedural aspects of implementing post-ROD changes to the selected remedy.
 Action: Delete the two sentences beginning on line 17 of page 9-1.

Replace with the following paragraph:

During the remedial design and remedial action processes new information may be developed that supports enhancing or making a change to the remedy selected in this ROD. This information could be developed as a result of additional investigations at the site or through the processes of design or value engineering following issuance of the ROD. If a nonsignificant or minor change to the ROD is deemed necessary, it will be recorded in a post-decision document file; nonsignificant changes are those that do not significantly affect the scope, performance or cost of a remedy. If a significant change to a component of the remedy in the ROD is warranted, it will be documented in an Explanation of Significant Differences. If a fundamental change to the overall remedy is deemed appropriate, it will be made through issuance of a ROD amendment. A fundamental change to a remedy typically involves a reconsideration of the overall management approach for addressing the hazardous substances in the environment. Any changes deemed necessary to the remedy selected in this ROD will be implemented in a manner consistent with applicable EPA guidance, and the technical and public participation requirements of the NCP.

45. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 9 Pg.#: 9-6 Line#: 5,6 Code: C
 Original Comment# 17
 Comment: Please add a short clarifying section here that explains that the perched waters with listed hazardous waste are being pre-treated to avoid introducing listed wastes to the main water treatment systems of the FEMP. Also, please state here that treatment residuals resulting from the pre-treatment of these listed perched waters will be managed as hazardous waste.
 Response: Agree with request.

Action: Will add the following two sentences on PG. 9-6, line 6: The perched water collected during excavation from the vicinity of the fire training area and the sludge drying beds (both facilities are designated RCRA-listed waste management units) will be pretreated to avoid introducing RCRA-listed hazardous wastes into the main water treatment processes at the FEMP's advanced wastewater treatment facility. The residuals resulting from this pretreatment step will be managed as RCRA-listed hazardous waste.

46. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 9.1.7 Pg.#: 9-13 Line#: 11-14 Code: C
 Original Comment# 18
 Comment: The referenced text appears to provide a vague pathway for getting out of institutional controls without public comment or revision of any binding document. This issue needs to be resolved in the context of Ohio EPA's previously stated comments on institutional controls. The language as written is specifically why Ohio EPA is concerned with putting decisions regarding land use and institutional controls into some later as yet undetermined document.
 Response: DOE is not seeking to create a vague pathway for getting out of institutional control obligations and does not consider the referenced language to provide such a pathway. DOE is attempting to involve the local community in final land use and property ownership decisions. As discussed in the response to Comment 32, DOE intends to specify required institutional control requirements during the remedial design process as a part of a final land use/regrading plan or as a separate submittal. This submittal will be subject to EPA approval and the enforceability provisions of the Amended Consent Agreement. However, to address the commentors concern, the text will be modified.
 Action: Delete the following phrase from lines 13 and 14 on pg. 9-13:

..."and will continue until deemed inappropriate by both DOE and EPA, following consultation with the State of Ohio."

See the Action for Comment 32, as well.

47. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 9.1.7 Pg.#: 9-14 Line#: 10-12 Code: C
 Original Comment# 19
 Comment: The referenced text was specifically stricken from the OU2 draft ROD based upon public concern and the commitment to continued federal ownership.
 Response: Disagree. See response to Comment 32.
 Action: None required.
48. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 9.1.9 Pg.#: 9-15 Line#: Code: C
 Original Comment# 20
 Comment: Since the site is moving forward with the Ten-Year plan and that documentation of this commitment would be useful, DOE should consider incorporation of that cost and schedule data into the document. The change from the Proposed Plan would be explained within Section 11. There could be significant benefits realized from incorporating such language into the ROD and subsequent notifications of its finalization.
 Response: DOE does not agree that it is necessary to document its commitment to the 10-year plan in the Operable Unit 5 ROD. The ROD must be consistent with the Operable Unit 5 FS and the 10-year plan cost and schedule assumptions were not used in the FS. OEPA has

been provided with documentation of DOE's intent to pursue a 10-year remediation schedule for the site and of the requirements necessary to achieve that cleanup scenario.

Action: None required.

49. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: Table 9-1 Pg. #: 9-16 Line#: 1-12 Code: C
 Original Comment# 21
 Comment: The table is very confusing and seems to have a number of "bottom lines". Either additional text should be added to explain the table, or replace the table with text.
 Response: Agree. Additional text will be added to further explain the cost number presented in Table 9-1, now Table 9-2.
 Action: Delete the paragraph on page 9-15, lines 27 through 30; replace with the following text:
- Table 9-2 presents the estimated cost of the selected remedy in three different manners; total cost, present worth cost, and total cost with escalation. The total cost of the remedy (\$840,000,000) represents the total estimated cost, in constant 1995 dollars, necessary to implement the selected remedy assuming no escalation or inflation occurs over the life of the remedy. The present worth cost (\$580,000,000) represents the total estimated present worth cost of the remedy assuming a discount rate of 2.8 percent. The present worth cost represents the sum of money which must be placed into a bank at the onset of remedial activities at an interest rate of 2.8 percent to progressively pay for the entire scope and duration of remedial actions. The total cost with escalation (\$2,110,000,000) represents the total estimated cost of remedial actions assuming that funding is provided on an annual basis and an annual escalation rate of 3.7 percent prevails throughout the duration of the remedy.
50. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10.1.4 Pg. #: 10-5 Line#: 2 Code: E
 Original Comment# 22
 Comment: Revise text to state "will not be exceeded."
 Response: Agree.
 Action: Text corrected as stated in Comment 21.
51. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10.2.1 Pg. #: 10-7 Line#: 4-12 Code: C
 Original Comment# 23
 Comment: Please replace the referenced text with that directly from the OU2 ROD (pg 10-5).
 Response: Agree.
 Action: Insert the text from the OU2 ROD beginning on page 10-5, 2nd paragraph second sentence and ending at the end of the fourth line on page 10-6. Insert will be placed after the sentence ending on line 6, page 10-7 of the August draft of the OU5 ROD.
52. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10.2.2 Pg. #: 10-8 Line#: 16-18 Code: C
 Original Comment# 24
 Comment: Please replace the referenced text with that directly from the OU2 ROD (pg 10-7) while incorporating new data of 20 feet of gray clay.
 Response: Agree.
 Action: Modify the text beneath 2nd bullet on page 10-8 to reflect the exact language used beneath the 3rd bullet on page 10-7 of the OU2 ROD.

53. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10.2.2 Pg. #: 10-9 Line#: 26 Code: C
 Original Comment# 25
 Comment: Please replace the referenced text with that directly from the OU2 ROD (pg 10-8).
 Response: Agree.
 Action: Add the following to the last sentence on line 26: ...are concentrations that are at a statistically significant level to be:

54. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10.2.2 Pg. #: 10-10 Line#: 14-21 Code: C
 Original Comment# 26
 Comment: Please replace the referenced text with that directly from the OU2 ROD (pg 10-9).
 Response: Agree.
 Action: Under "Time required for results:" delete "Not applicable to this circumstance."
 Replace with the following: Construction of a disposal facility with additional engineering controls will not take significantly longer than the time required for a disposal facility that strictly meets the Ohio solid waste disposal regulations.

Add to line 21 at the end of the current paragraph: This waiver is applicable only to Operable Unit 5 on-site remediation wastes. If on-property disposal is chosen as the selected remedy for other FEMP operable units, separate waivers from this Ohio requirement would be necessary.

55. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10.4 Pg. #: 10-12 Line#: 11-12 Code: C
 Original Comment# 27
 Comment: DOE's conclusions that the selected remedy "does provide significant reduction of..." is inconsistent with its conclusion in the OU2 ROD that the selected remedy "does not provide significant reduction...". A smaller portion of the waste stream from OU5 is being treated than is treated under the OU2 ROD, thus the basis for deciding that a significant reduction is occurring in OU5 is unclear.
 Response: To alleviate OEPA's concern, DOE has removed the word "significant" from the sentence in question. However, DOE would like to note that it is generally advantageous to all parties (DOE, EPA and OEPA) to identify and take credit for all remedy elements that contribute beneficially to the statutory findings required in this section of the ROD, wherever there is an opportunity to do so. DOE also desires to clarify that because the RCRA COC's are considerably more widespread in the Operable Unit 5 environmental media compared to the Operable Unit 2 waste units (in fact, the Operable Unit 2 wastes contain only the RCRA constituent lead that is limited to the geographic area associated with the firing range), it is logical to conclude that there is a much broader opportunity to treat RCRA-related materials (for waste acceptance purposes) in Operable Unit 5 than Operable Unit 2. On this basis, highlighting a potential for a reduction in mobility, toxicity, or volume for the RCRA constituents in the Operable Unit 5 ROD is not necessarily inconsistent with the language adopted by Operable Unit 2. This opportunity for treatment of Operable Unit 5 materials is further enhanced by DOE's commitment to treat soil containing RCRA characteristic waste from six geographic areas of the FEMP to satisfy OEPA's stipulation requiring this treatment. DOE is concerned about apparent inconsistencies raised by OEPA in this comment (which downplays the significance of treating RCRA-contaminated soil) and Comment 30 (where OEPA promotes the significance of treatment). DOE is also concerned that Comment 30 appears inconsistent with the conclusions drawn by EPA in Comment 25 that the significance of treating

RCRA-contaminated soil is "overstated" considering the small volume of soil contaminated with RCRA-regulated contaminants.

Action: Strike the word "significant" on pg. 10-12, line 11 and modify sentence on line 14 to read: "...or to meet on-property waste acceptance criteria, including the criterion to treat soil containing RCRA characteristic waste from six designated geographic areas..."

56. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10.4 Pg.#: 10-12 Line#: 18 Code: C
 Original Comment# 28
 Comment: Revise the sentence to state "...extracting and selectively treating..." since all ground water won't be treated.
 Response: Agree.
 Action: Add word "selectively" to this sentence.
57. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10 Pg.#: 10-13 Line#: 25 Code: C
 Original Comment# 29
 Comment: Please strike the word 'necessity' and replace with 'desirability' or 'utility'.
 Response: The Task Force uses the word "prudent" in their final report.
 Action: Change "necessity" to "prudence" on pg. 10-13, line 25.
58. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10 Pg.#: 10-14 Line#: 10-13 Code: C
 Original Comment# 30
 Comment: Please add concentration-based discharge criteria to this sentence.
 Response: Based on the position of EPA and OEPA regarding the need for a concentration-based uranium discharge standard to the Great Miami River and the subsequent resolutions concerning the implementation approach for this standard, DOE no longer requests a variance from the remedy that was provided in the Proposed Plan. The sentence identified by the commentor will be removed from the document and Section 11 will be deleted to reflect the resolutions with EPA and OEPA concerning the 20 ppb discharge standard.
 Action: Delete the text on pg. 10-14, lines 4 through 15. Delete similar language on pgs. 8-11 and A.2-4, and delete Section 11.0 in its entirety.
59. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10.6 Pg.#: 10-15 Line#: Code: C
 Original Comment# 31
 Comment: The language provided in the referenced text differs from that in the OU2 ROD and appears to differ from the agreed to language from OU4 and OU1. The language should be revised to that previously approved in negotiations by Ohio EPA and DOE.
 Response: DOE sees considerable inconsistency between this comment and Comment 73, submitted by OEPA on October 2, which asks that Section 10.6 be deleted from the Operable Unit 5 ROD. See our response to Comment 73.
 Action: None.
60. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: 10 Pg.#: 10-15 Line#: 17 Code: C
 Original Comment# 32
 Comment: Please explicitly state here that the characteristic hazardous wastes will be treated to the extent necessary to remove the characteristics that cause them to be regulated.
 Response: Agree to add language to reflect this concern and the agreements discussed in detail in

Comment 30.

Action: Add following sentence on line 21: Additionally, RCRA characteristic wastes located within six geographic areas designated in Section 9.0 of this ROD will be treated to the extent necessary to remove the characteristics that cause them to be regulated before on-property disposal.

61. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.1.2 Pg.#: A.1-2 Line#: 12-14 Code: C
 Original Comment# 33
 Comment: A number of commentors stated the cleanup levels were appropriate and at least one suggest ground water cleanup should go further. If DOE feels it necessary to provide such summaries of comments then it should represent the comments of both sides of the issue.
 Response: Agree with request.
 Action: The following sentence will be added on line 14: "Other commentors stated that the cleanup levels were appropriate and at least one commentor suggested that the groundwater cleanup should be taken as far below proposed or final drinking water standards as is reasonably achievable."
62. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.2.1 Pg.#: A.2-2 Line#: 1-2 Code: C
 Original Comment# 34
 Comment: The Task Force was not formed to develop a "public consensus" but to provide DOE recommendations on the issues of cleanup and future use.
 Response: Agree.
 Action: Use the language from the Task Force's final report and change the first sentence on pg. A.2-2 to read: ...Task Force was chartered to provide DOE, EPA and OEPA with recommendations about cleanup solutions and future courses of action at the FEMP.
63. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.3.0 Pg.#: A.3-28 Line#: Code: C
 Original Comment# 35
 Comment: The response fails to address the commentors suggestion that the bedrock would need to be excavated. It seems appropriate to address this issue specifically as this is the only commentor to address potential bedrock contamination. The response should state that data shows no bedrock contamination thus there would be no need to excavate it.
 Response: Disagree. The last two sentences of the response on page A.3-28 do address this commentor's concern.
 Action: None required.
64. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.3.0 Pg.#: A.3-70 Line#: Dunn,P. 6 Code: C
 Original Comment# 36
 Comment: The commentor specifically addresses off-site waste being "...disposed of within the FEMP boundaries...". The response only addresses off-site waste within the OU5 disposal facility. DOE should address the fact that it is only partly responding to the commentor's concern.
 Response: Agree.
 Action: Add the following sentence to the end of the comment response: For the other FEMP operable units, both 4 and 1 are committed to off-site shipment of their waste. The final ROD for Operable Unit 2 contains language clearly prohibiting off-site waste being brought to the FEMP for disposal in their on-property disposal facility. When Operable

Unit 3 prepares its ROD next year, similar language will be included. DOE's commitment on this matter covers the entire FEMP site.

- 65. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.3.0 Pg.#: A.3-94 Line#: Rench, T.E. 2 Code: E
 Original Comment# 37
 Comment: Revise "siteing" to state "siting."
 Response: The commentor spelled the word in question in this way. DOE never edits or changes the content of public comments.
 Action: None.

- 66. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.3.0 Pg.#: A.3-96 Line#: Renck, T.E. 5, Response 2nd par Code: E
 Original Comment# 38
 Comment: Insert "water" following "perched."
 Response: Agree.
 Action: Add the word "water" to the first sentence of the second paragraph of the response.

- 67. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.3.0 Pg.#: A.3-97 Line#: Renck TE 6, Response 2nd para. Code: C
 Original Comment# 39
 Comment: Delete "full" preceding "restoration". The GMA will be remediated to MCLs, etc. The response suggests the GMA will be restored to background or its original state.
 Response: Agree.
 Action: Make correction stated in comment.

- 68. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.3.0 Pg.#: A.3-116 Line#: Shulte, A 2, Response Code: C
 Original Comment# 40
 Comment: The comment included a specific reference to the waiver but it was lost during the breakup of the letter. One of the responses should be revised to include some discussion of the waiver and its justification.
 Response: Agree. The bracket on the A. Schulte comment sheet was meant to include all but the final sentence of the paragraph.
 Action: Add the following response to the A. Schulte comment, "There is a law to protect this aquifer, but there is a waiver issued that will allow for the storage cell"; designate this as Comment 1a:

The DOE considers the restoration and protection of the sole-source Great Miami Aquifer one of its highest priorities. The selected alternative for Operable Unit 5 includes an expenditure in excess of \$160 million on aggressive groundwater extraction and treatment. In light of DOE's commitment to restore and protect the aquifer, the decision to recommend an on-property facility was not made lightly. After detailed analysis of several potential alternatives on the basis of implementability, risk and cost, an on-property disposal facility was determined to be the only alternative that was implementable and practical. Treatment alternatives were eliminated based on their inability to attain the cleanup goals and off-site disposal was eliminated based on uncertainties regarding the availability of disposal capacity throughout the duration of the project and on cost.

As a result of this analysis, the DOE recommended an on-property disposal facility that requires a waiver of the State of Ohio prohibition on siting a landfill over a sole-source

aquifer. There are two facts to be noted regarding the sole-source aquifer prohibition and the waiver. First, the prohibition is intended to encourage the siting of new commercial facilities in geologically appropriate areas by prohibiting their siting over an aquifer. The prohibition is relevant to the FEMP and warrants a great deal of consideration, although the situation here differs from that of a commercial enterprise intent on profiting from a new disposal facility. The DOE's intent is to improve conditions at an already contaminated facility. As discussed above, the on-property facility is the only practical and implementable remedy.

Second, in order to waive a state requirement, the EPA must require that the DOE demonstrate that the selected alternative will attain a standard of performance that is equivalent to what would have been provided under the otherwise applicable requirement. In this case, the DOE demonstrated to EPA's satisfaction that the siting of a disposal facility at the FEMP would not result in concentrations of contaminants exceeding drinking water standards in the aquifer throughout a performance period of 1000 years.

Use of the aquifer will in no way be impacted by the disposal facility. The DOE (or a successor federal entity) will maintain a groundwater monitoring program to ensure protection of the Great Miami Aquifer and take corrective action if unacceptable impacts are detected.

69. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.3.0 Pg.#: A.3-116 Line#: Shulte, A 3, Response Code: C
 Original Comment# 41
 Comment: This comment did not occur on the previous comment sheet. The text should reference the source of the comment, which is believed by this reviewer to be the public comment session.
 Response: Commentor is correct.
 Action: Add the page(s) from the transcript that contains the comment made by A. Shulte that elicited the third part of the response.
70. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.4.0 Pg.#: A.4-1 Line#: 24-26 Code: C
 Original Comment# 42
 Comment: A significant number of public comments addressed the need for the OU5 ROD to specifically address ownership and institutional controls. It is unclear if any commentors suggested delaying the determination until the RD. The only recommendation for such action has come from the Task Force. Thus it is clear that this provides an accurate summary of the public comments received.
 Response: Agree if we are correct in assuming that the commentor meant there to be a 'not' before 'clear' in the last sentence.
 Action: Delete bullet beginning on line 24.
71. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: A.4.0 Pg.#: A.4-1 Line#: Code: C
 Original Comment# 43
 Comment: The section fails to reference the substantial comments concerning no characteristic waste in the on-site disposal cell.
 Response: A bullet will be added to accommodate this request.
 Action: Add bulleted sentence on page A.4-1: "DOE should treat soil that contains RCRA characteristic properties to remove the characteristic before on-property disposal."

72. Commenting Organization: Ohio EPA Commentor: OFFO
 Section#: Appendix B Pg.#: Line#: Code: C
 Original Comment# 44

Comment: Please see the attached sheet for a listing of ARAR discrepancies. We have listed only those ARARs and TBCs which Ohio EPA believes should be included in this ROD that we could not find in Appendix B.

Response: Agree. Please see the third column added to your list for specific responses and actions for each citation identified.

Citation	Description	Response and Action
Ohio Revised Code (ORC) 3704.05 A thru I	Prohibits air pollution	This requirement will not be included because a permit is not required for remediation at a CERCLA site.
ORC 3734.02(I)	air emissions from HW facilities	Already included as an applicable, action-specific requirement in Table B.3 of Appendix B, p. B.3-17.
ORC 3734.02.7 A,B	prohibits commingling of LLW w/ solid waste	Include as an applicable, action-specific requirement in Table B.3 of Appendix B.
ORC 3734.03	prohibits open dumping or burning	Include as an applicable, action-specific requirement in Table B.3 of Appendix B.
ORC 6111.04	prohibits pollution of waters of the State	Include as an applicable, action-specific requirement in Table B.3 of Appendix B.
ORC 6111.07 A,C	prohibits failure to comply w/ water pollution control requirements	Include as an applicable, action-specific requirement in Table B.3 of Appendix B.
Ohio Administrative Code (OAC) 3745-34-07	prohibits unauthorized injection into groundwater	Include as an applicable, action-specific requirement in Table B.3 of Appendix B.
OAC 3745-34-08	prohibits injection of hazardous or radioactive waste	Include as an applicable, action-specific requirement in Table B.3 of Appendix B.
OAC 3745-50-44 Paragraph A	establishes substantive hazardous waste permit requirements	This requirement will not be included because the administrative requirements of a permit is not required for remediation at a CERCLA site.
OAC 3745-50-44 Paragraph B	establishes substantive hazardous waste land disposal requirements	This requirement will not be included because the administrative requirements of a permit is not required for remediation at a CERCLA site.
OAC 3745-50-44 Paragraph C6	establishes substantive hazardous waste requirements for land units	This requirement will not be included because the administrative requirements of a permit is not required for remediation at a CERCLA site.
OAC 3745-50-44 Paragraph C9	establishes substantive hazardous waste requirements for miscellaneous units	This requirement will not be included because the administrative requirements of a permit is not required for remediation at a CERCLA site.
OAC 3745-56-51 Paragraphs A thru F	hazardous waste piles	Already included as a relevant and appropriate, action-specific requirement in Table B.3, p. B.3-2 of Appendix B per the CAMU Rule.

Citation	Description	Response and Action
OAC 3745-56-54 Paragraphs A,B	hazardous waste piles	Already included as a relevant and appropriate, action-specific requirement in Table B.3, p. B.3-2 of Appendix B per the CAMU Rule.
OAC 3745-56-56 Paragraphs A,B	hazardous waste piles	Include as a relevant and appropriate, action-specific requirement in Table B.3 of Appendix B per the CAMU Rule.
OAC 3745-56-57 Paragraphs A,B,C	hazardous waste piles	Include as a relevant and appropriate, action-specific requirement in Table B.3 of Appendix B per the CAMU Rule.
OAC 3745-56-58 Paragraphs A,B,C	hazardous waste piles	Already included as a relevant and appropriate, action-specific requirement in Table B.3, p. B.3-2 of Appendix B per the CAMU Rule.
OAC 3745-56-59 Paragraphs A	hazardous waste piles	This requirement will not be included because the administrative requirements of a permit is not required for remediation at a CERCLA site.
OAC 3745-9-04 Paragraphs A,B	monitor wells siting	Paragraph (B) will not be included because wells must occasionally be installed through the foundation of the building to monitor groundwater quality. Include Paragraph (A) as an applicable action-specific requirement in Table B.3 of Appendix B.
OAC 3745-9-05 Paragraphs A1,B thru H	monitor well construction	Include as an applicable action-specific requirement in Table B.3 of Appendix B.
OAC 3745-9-06 Paragraphs A,B,D,E	monitor well casing requirements	Include as an applicable action-specific requirement in Table B.3 of Appendix B.
OAC 3745-9-07 Paragraphs A thru F	monitor well surface design	Paragraph (D) will not be included because well pumps at the site are frequently used to extract contaminants from groundwater. Include remaining paragraphs as applicable action-specific requirements in Table B.3 of Appendix B.
OAC 3745-9-08 Paragraphs A,C	start-up of new monitor wells	Paragraph (A) will not be included because on-site monitoring wells are not used for drinking water and therefore are not "disinfected." Include Paragraph (C) as an applicable action-specific requirement in Table B.3 of Appendix B.
OAC 3745-9-09 Paragraphs A thru C,D1 and E thru G	maintenance of monitor wells	Paragraph (D)(1) will not be included because on-site monitoring wells are not used for drinking water and therefore are not "disinfected." Include remaining paragraphs as applicable action-specific requirements in Table B.3 of Appendix B.
OAC 3745-9-10 Paragraphs A,B,C	abandonment of test holes and monitor wells	Already included as an applicable action-specific requirement in Table B.3, p. B.3-25 of Appendix B.
OAC 3745-9-11	prohibits disposal in wells	This requirement will not be included because a permit is not required for remediation at a CERCLA site.

ATTACHMENT TO COMMENT 19

GMR DISCHARGE

DISCUSSION

BACKGROUND

FS/PP

- FS/PP adopted position that blended effluent to the GMR would:
 - Exhibit concentrations less than MCLs and 20 ppb uranium (drinkable discharge)
 - Contain less than 600 pounds of uranium per year
 - Meet FRLs in GMR
 - Meet NPDES permit limitations
- FS/PP also provided that FEMP would:
 - Continue to operate treatment systems and apply available excess capacity to groundwater
 - Expand capacity of AWWT to fullest extent within existing building

ROD

- DOE Draft ROD revisited position and proposed to eliminate establishment of enforceable discharge limitations of 20 ppb uranium and MCLs
- Basis of Change:
 - FS modeling indicates FEMP barely attained 20 ppb limitation for preferred remedy in PP
 - Modeling for South Plume Optimization and ReInjection indicate 20 ppb uranium discharge limit cannot be attained without more capacity or extension to pumping
 - Could not establish firm foundation in regulation or protectiveness to warrant additional federal expenditures
 - 20 ppb limit not aligned with FRLs for GMR
 - Spikes in uranium concentration in AWWT influent expected. Will impact effluent concentrations.

DRAFT EPA COMMENTS ON ROD

- Establish average discharge limitation that allows for fluctuations in discharge flow rates and uranium concentration (while ensuring against discharges of relatively high uranium concentrations).
- Average discharge limitation would become enforceable standard in ROD.
- Establish monitoring program to measure flow and uranium with 24 hour composite samples.
- ROD should establish process for reporting and instituting corrective measures for extraction/treatment in event 600 lbs/year limit, average discharge limit or GMR FRL is exceeded.

BACKUP INFORMATION PACKAGE

**PROJECTED IMPACTS TO THE GREAT MIAMI RIVER DURING REMEDIATION
- BASED ON SIMULATED RANGE OF OUTFALL CONDITIONS**

PREPARED FOR THE
TIE MEETING BETWEEN
U.S. EPA, OHIO EPA AND DOE

Fernald, OH

September 5, 1995

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PROJECTED IMPACTS TO THE GREAT MIAMI RIVER

1.0 INTRODUCTION

1.1 OBJECTIVES

- Provide realistic estimations of the outfall concentration and mass discharge rate during remediation under various groundwater remediation scenarios.
- Identify critical factors that will affect the outfall conditions.
- Summarize uncertainties related to the critical factors.

1.2 TECHNICAL APPROACH

- Define current best estimates regarding waste water streams and treatment capacity/efficiency.
- Develop potential groundwater extraction/reinjection scenarios.
- Conduct model simulations of the groundwater extraction/reinjection scenarios to estimate well head concentrations.
- Calculate outfall conditions under various treatment scenarios.
- Provide estimations of required treatment capacities to achieve various outfall criteria.

PROJECTED IMPACTS TO THE GREAT MIAMI RIVER

2.0 BACKGROUND INFORMATION

2.1 GREAT MIAMI RIVER

- Background Uranium Concentration 3 TO 4 ug/l
- Average River Flow Rate 1.55 x 10⁶ gpm (3460 cfs)
- 7Q10 River Flow Rate 1.26 x 10⁵ gpm (280 cfs)
- Expected Use/Exposure Scenario Meat and Milk User/Recreational
- Surface Water FRL 530 ug/l

2.2 PRELIMINARILY ESTIMATED OUTFALL FLOW RATES DURING REMEDIATION

- Maximum Instantaneous Total Discharge Rate 6000 gpm (13.4 cfs)
- Maximum Instantaneous Untreated Discharge Rate 4000 gpm (8.9 cfs)
- Normal/Average Total Discharge Rate 4500 gpm (10 cfs)
- Normal/Average Untreated Discharge Rate 2500 gpm (5.6 cfs)
- Conservative Dilution Factor In The River 20

PROJECTED IMPACTS TO THE GREAT MIAMI RIVER

3.0 GROUNDWATER REMEDIATION

3.1 PROPOSED OPTIONS FOR GMA GROUNDWATER RESTORATION

OPTIONS	MAXIMUM GROUNDWATER TREATMENT CAPACITY (GPM)	CONCEPTUAL OPERATIONS	NOTES
I	2000	STAGE I: FS RATE STAGE II: OPTIMIZATION	BASELINE (CURRENT ROD)
II	2000	STAGE I: LOWER RATE STAGE II: OPTIMIZATION	SLOWER CLEAN UP TIME LOWER IMPACTS TO THE GMR
III	2000	STAGE I: OPTIMIZATION STAGE II: OPTIMIZATION	FASTER CLEAN UP TIME

NOTE: STAGE I - During the first flush (expected to be about 5 to 7 years).

Due to the geochemical conditions, STAGE I is also the critical time period when the outfall concentrations are expected to be higher.

STAGE II - Remaining time frame when the slower desorption process is dominant.

3.2 GROUNDWATER EXTRACTION/REINJECTION SCENARIOS (WITH EMPHASIS ON OPERATION IN STAGE I)

TIME (YEAR)	SYSTEM	GROUNDWATER		REMEDIATION		STRATEGY
		FS RATE (gpm)	LOWER RATE (gpm)	LOWER RATE (gpm)	OPTIMIZATION (gpm)	
0 - 2	SSOD/SOUTH FIELD	0	0	0	0	0
	FENCE LINE	0	0	0	0	0
	SOUTH PLUME	1500	1400	1400	1400	1400
3 - 5	SSOD/SOUTH FIELD	2000	900	900	900	900
	FENCE LINE	500	0	0	-1000	-1000
	SOUTH PLUME	1500	1400	1400	600/900	600/900
6 - 10	SSOD/SOUTH FIELD	2000	900	900	900	900
	FENCE LINE	500	1000	1000	-1000	-1000
	SOUTH PLUME	1500	600	600	600/900	600/900
11 - 15	SSOD/SOUTH FIELD	2000	900	900	900	900
	FENCE LINE	1000	1000	1000	-1000	-1000
	SOUTH PLUME	1000	600	600	600/900	600/900

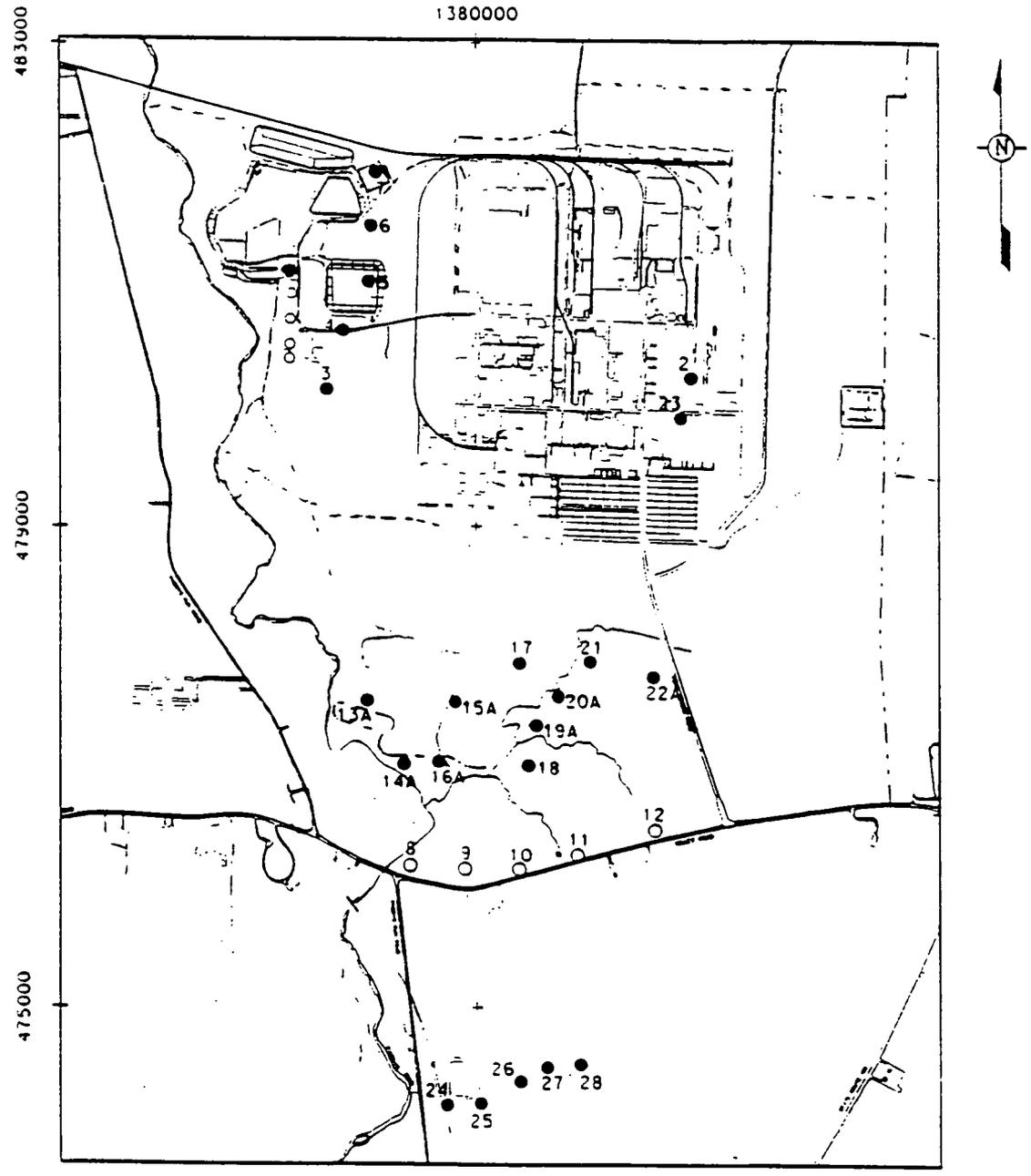
NOTE: - Time 0 is October 1, 1995

- For purposes of this evaluation which include estimation of the duration of higher impacts to the Great Miami River, STAGE I is conservatively extended to 15 years in model simulations.

- A uranium K_d value of 1.78 L/kg is used in model simulations for STAGE I.

- The Waste Pit and Production Area Systems are expected to be brought online after the above listed Systems reach STAGE II.

P0129/SKK03717.DGN STATE PLANAR COORDINATE SYSTEM 1927



LEGEND:

- EXTRACTION WELL
- INJECTION WELL

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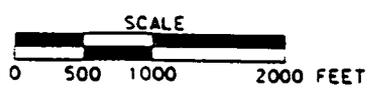
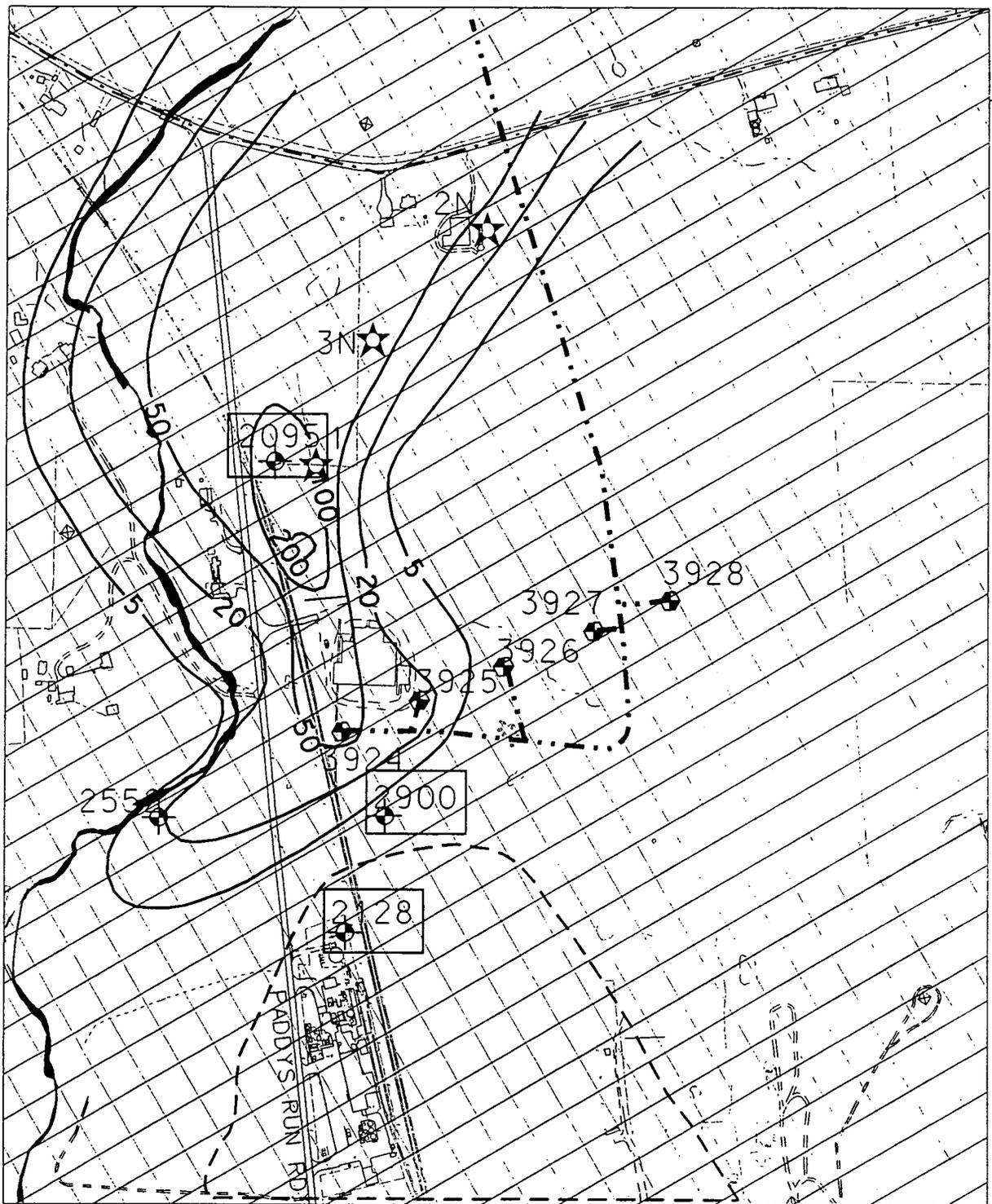


FIGURE 2-2 - WELL FIELD PATTERN A

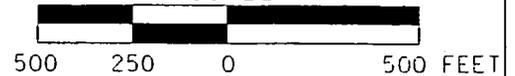
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LEGEND:

- ✦ MONITORING WELL
- ☆ PROPOSED WELL LOCATIONS
- ⊕ RECOVERY WELL
- - - FEMP BOUNDARY
- · - · FORCE MAIN

SCALE



DRAFT

FIGURE 2-X. TITLE

PROJECTED IMPACTS TO THE GREAT MIAMI RIVER

4.0 ASSUMPTIONS AND STRATEGY FOR GROUNDWATER TREATMENT

4.1 MAJOR ASSUMPTIONS AND UNCERTAINTY

MAJOR ASSUMPTIONS

● Treatment Capacity And Schedule	MODERATE
● Treated Effluent Concentrations	LOW
● Remediation Waste Water Inflow Rates And Associated Concentrations	HIGH
● Frequency Of Overflow Events And Concentrations	HIGH
● Well Installation And Operational Schedule	MODERATE
● Extracted Groundwater Inflow Rates	LOW

CURRENT UNCERTAINTY

4.2 OTHER IMPORTANT ASSUMPTIONS

- The combined flow from the existing South Plume extraction wells can not be subdivided for treatment. Flows from each of the new extraction wells can be individually treated.
- Capacity of an interim water treatment module is 250 gpm.
- Treated groundwater is the only source of injection water.

4.3 GROUNDWATER TREATMENT STRATEGY

- Treat inflows with higher concentrations above 20 ug/l up to the available treatment capacity.

PROJECTED IMPACTS TO THE GREAT MIAMI RIVER

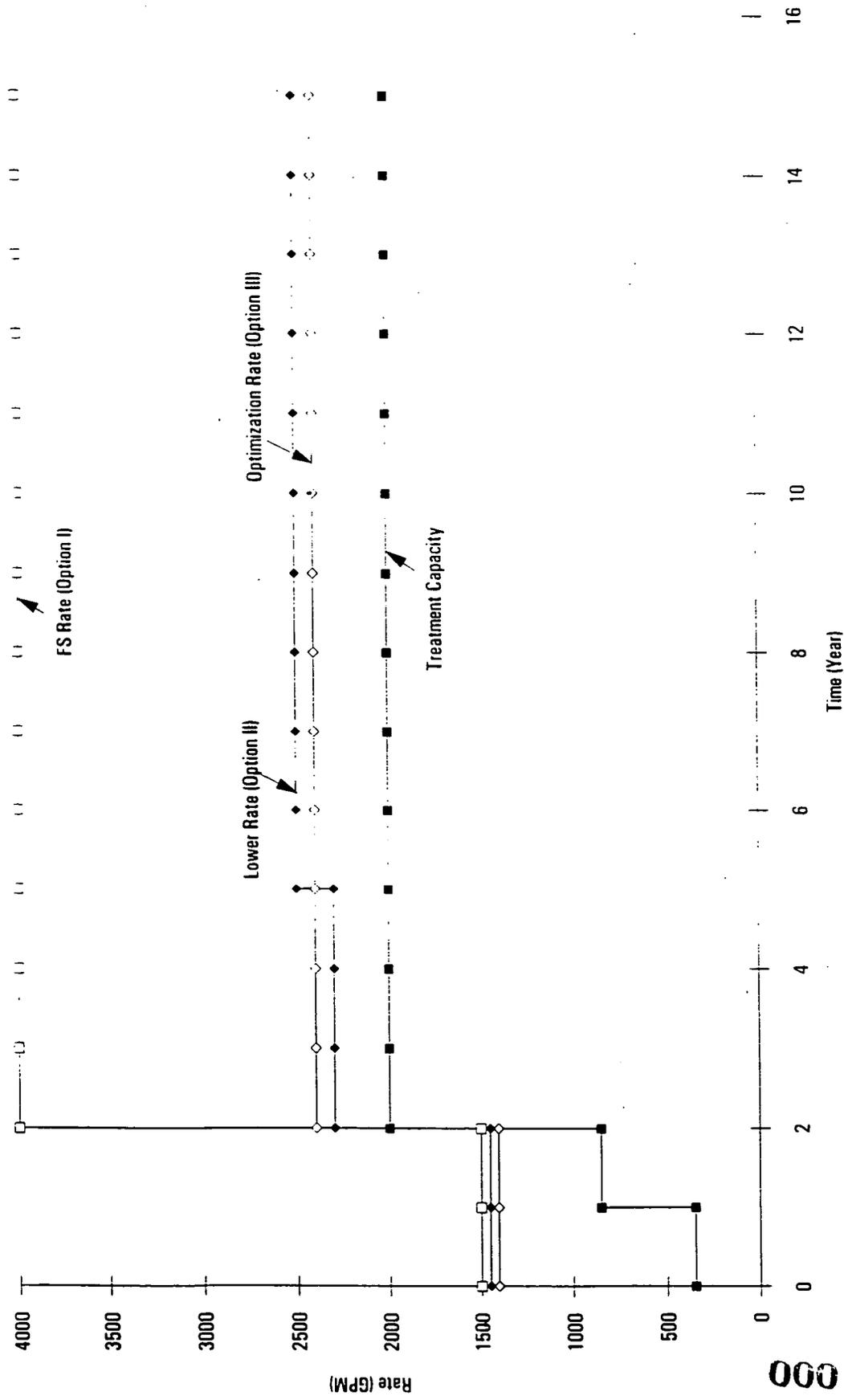
5.0 ESTIMATED IMPACTS

5.1 OUTFALL CONCENTRATION

5.2 MASS DISCHARGE RATE

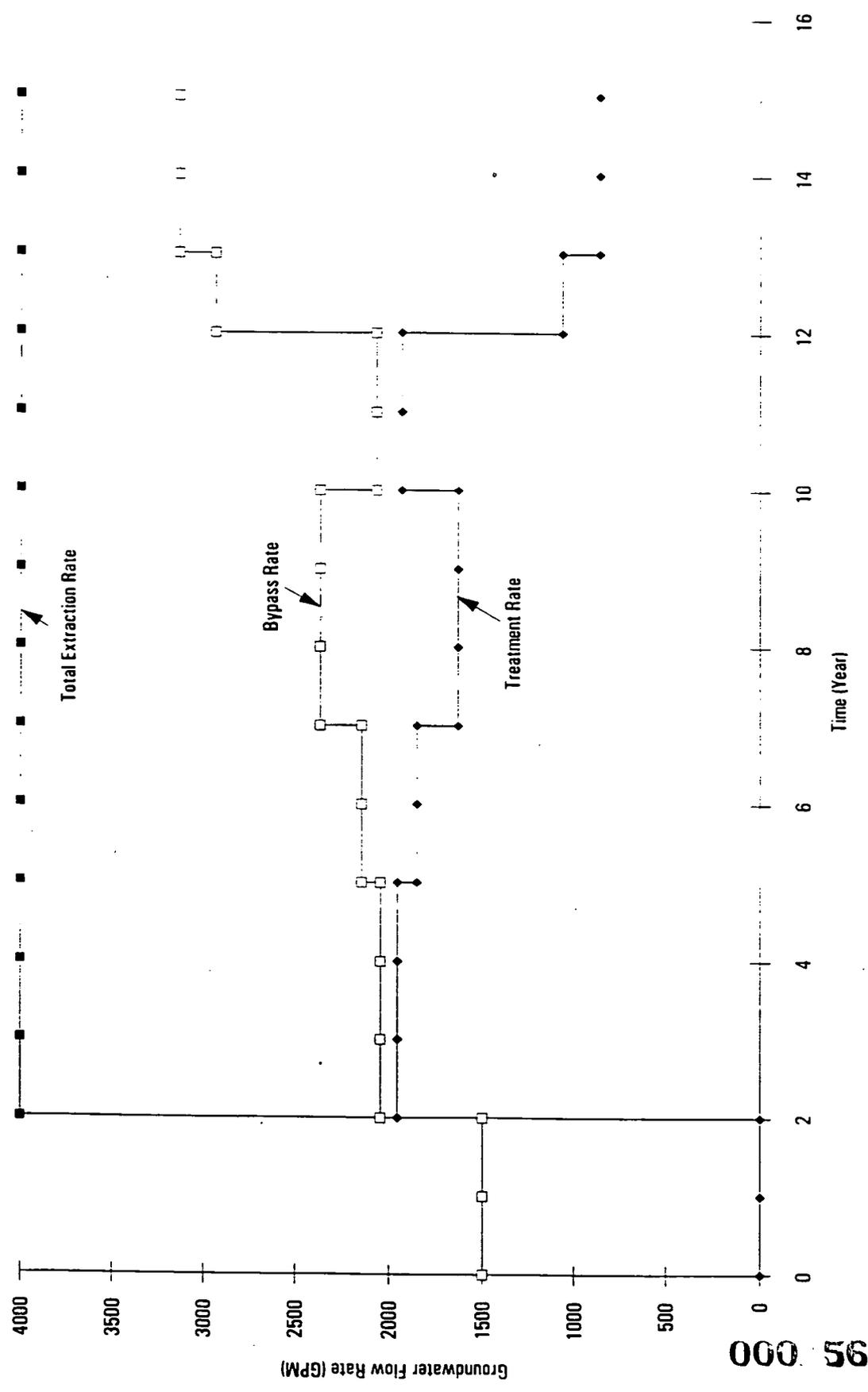
5.3 GREAT MIAMI RIVER CONCENTRATION

Groundwater Extraction Rates and Treatment Capacity - Summary

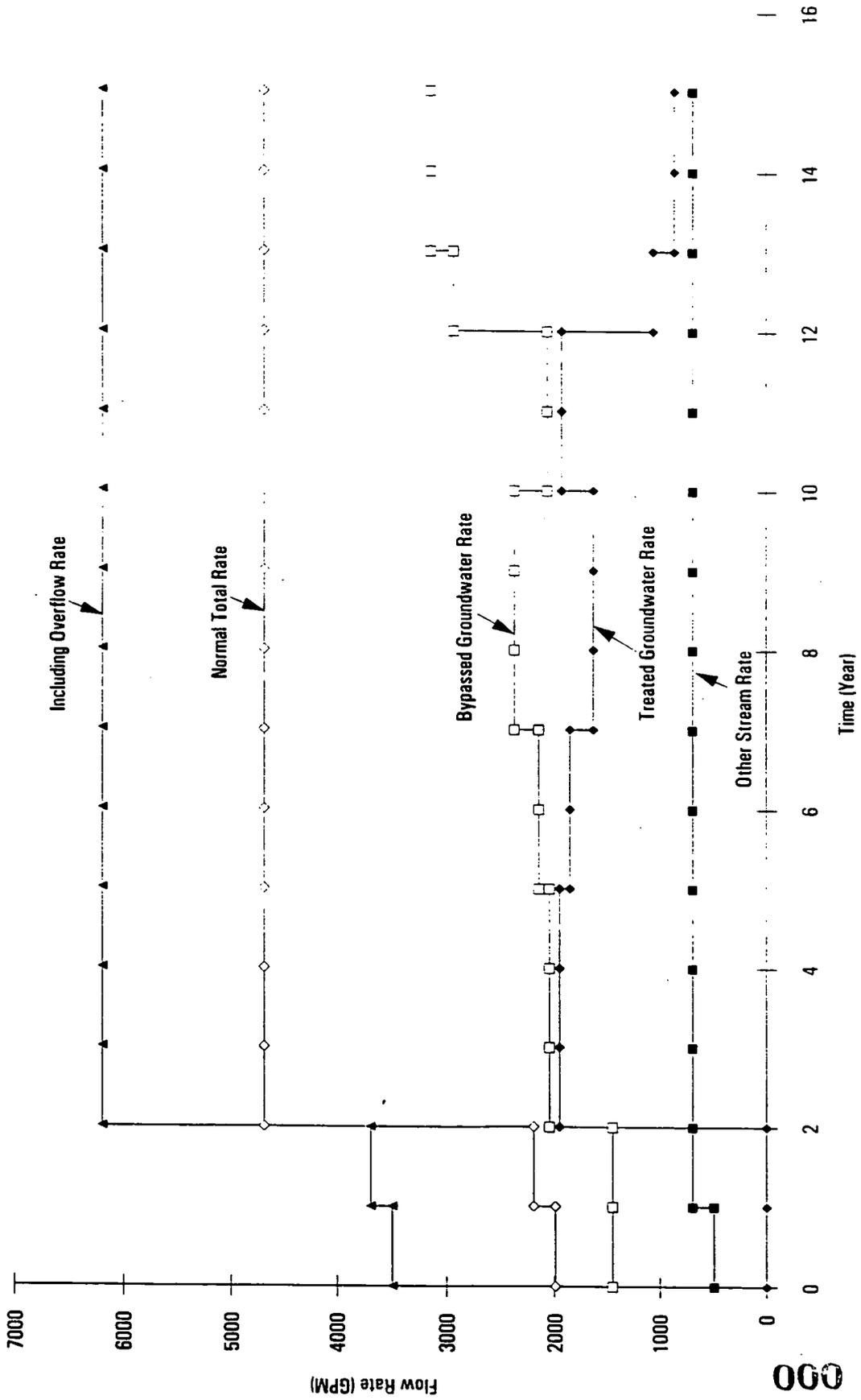


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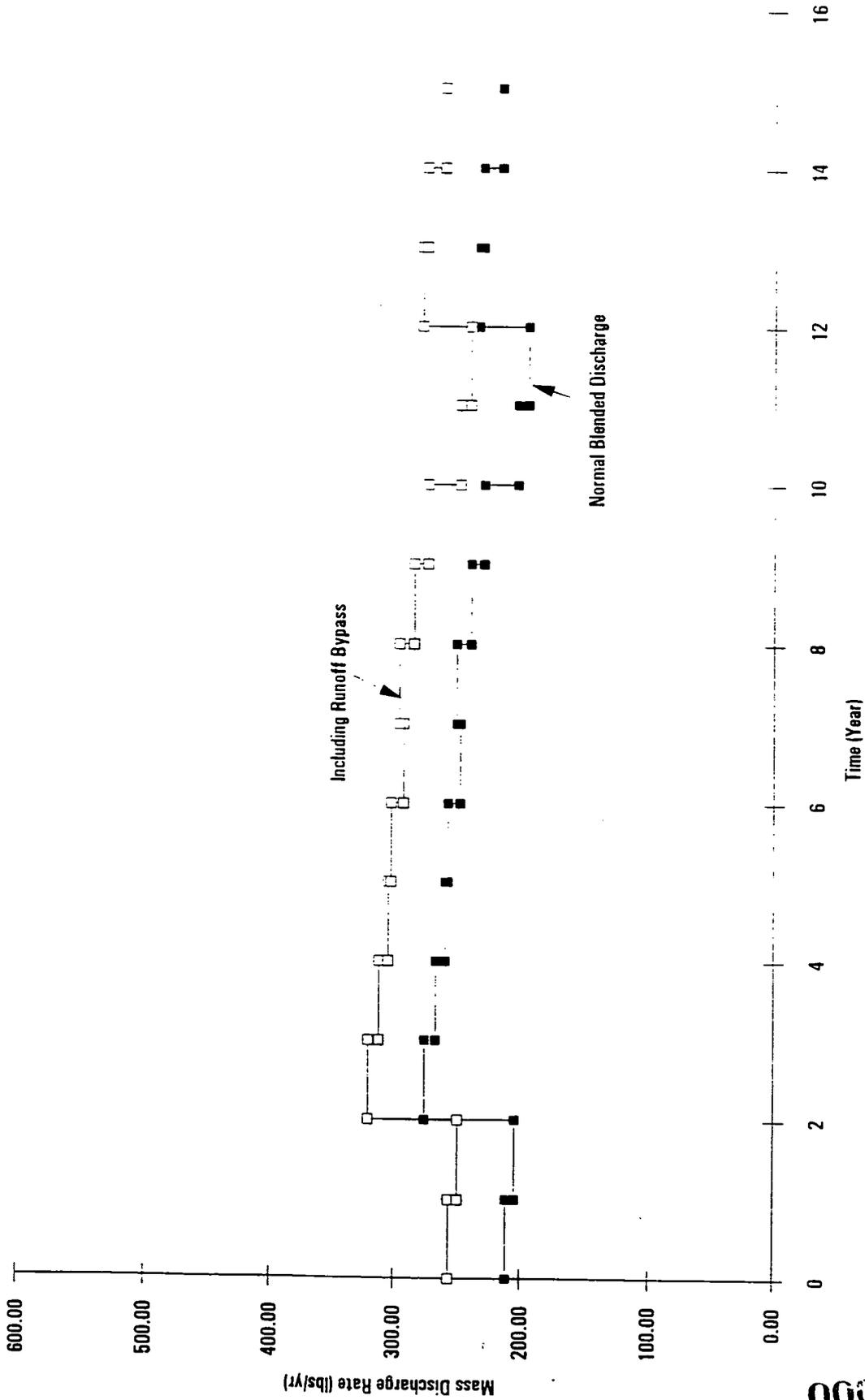
Groundwater Extraction/Treatment/Bypass - FS Rate (Option I)



Outflow Flow Rate - FS Rate (Option I)

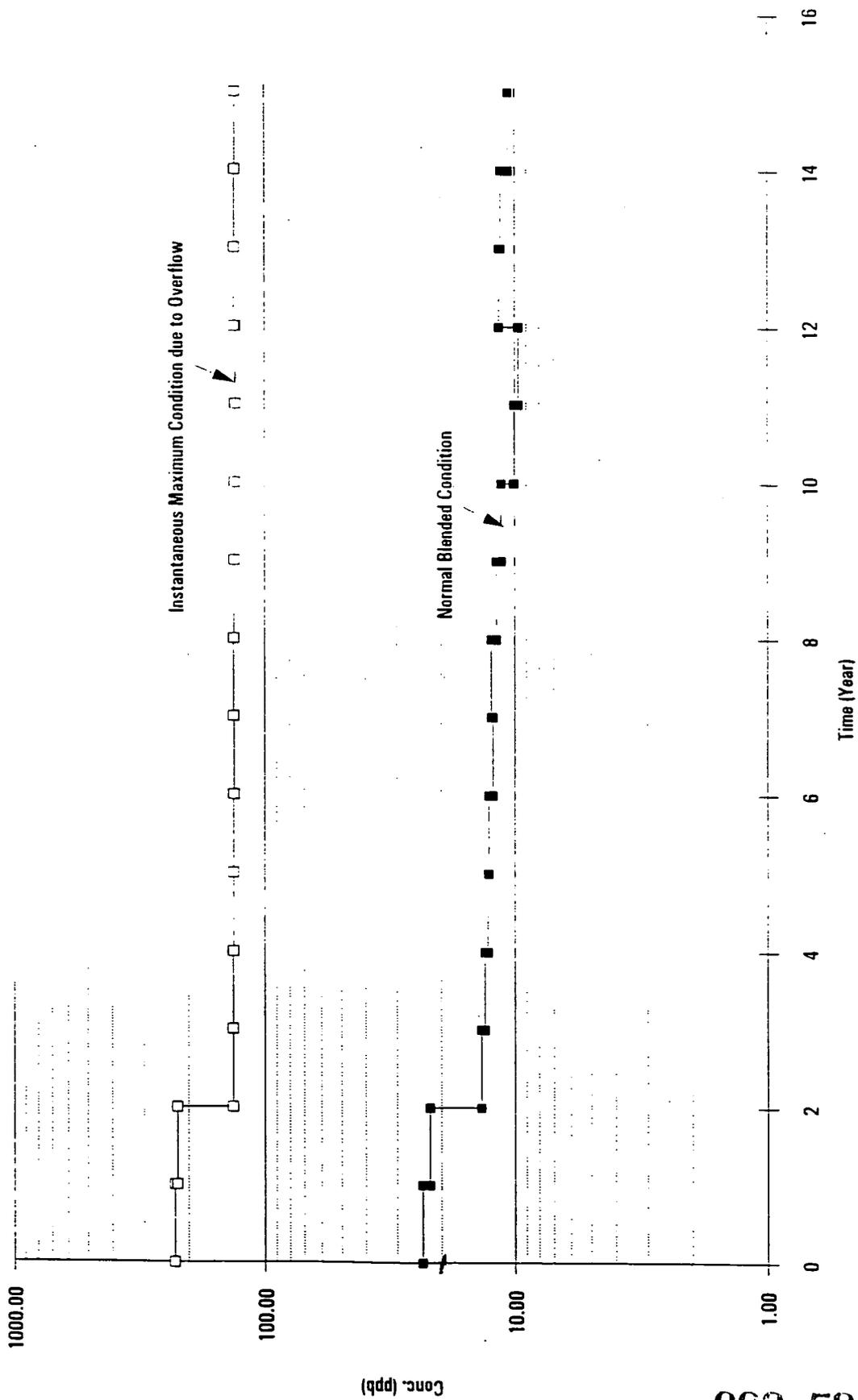


Outfall Annual Mass Discharge Rate - FS Rate (Option 1)



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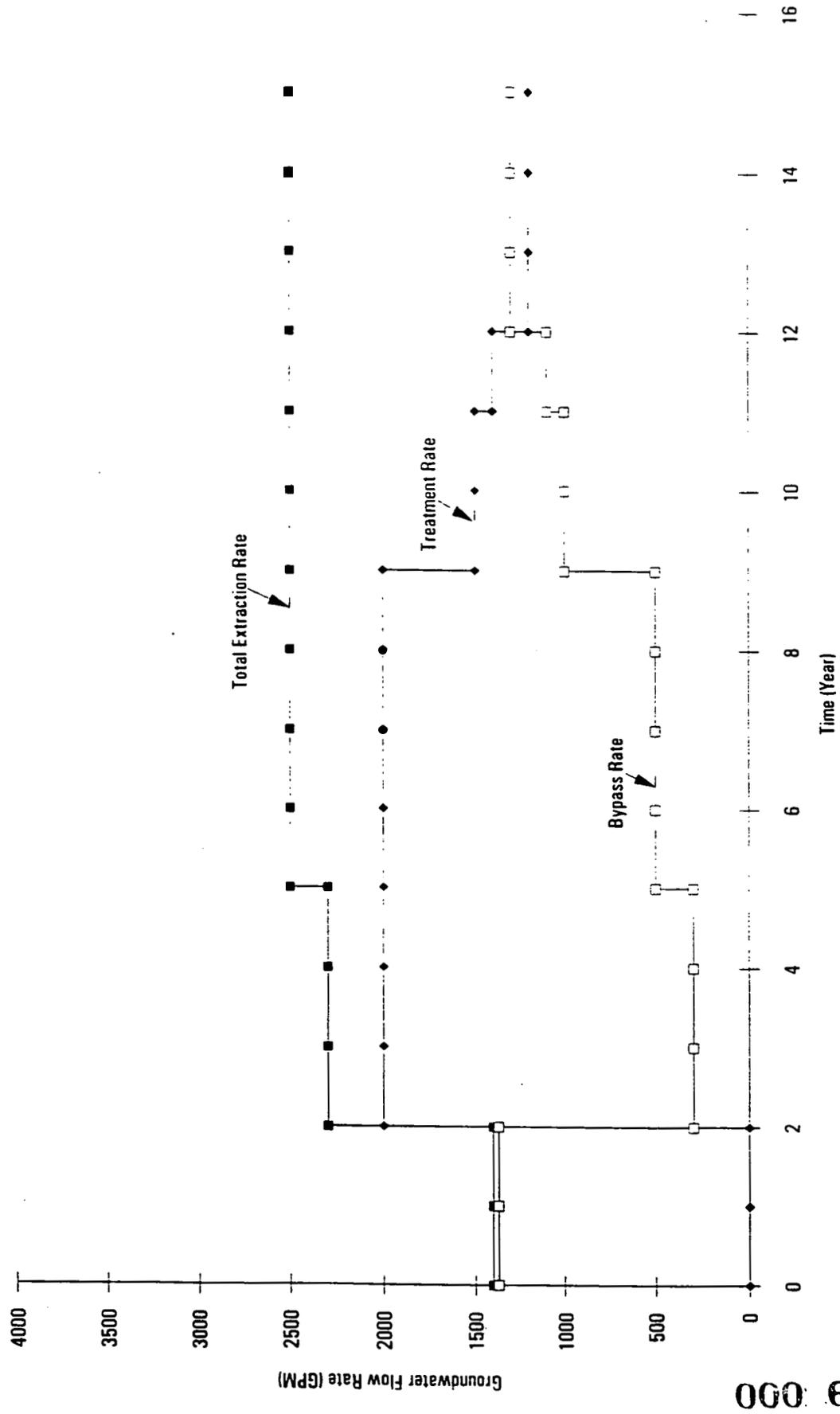
Outfall Concentration - FS Rate (Option I)



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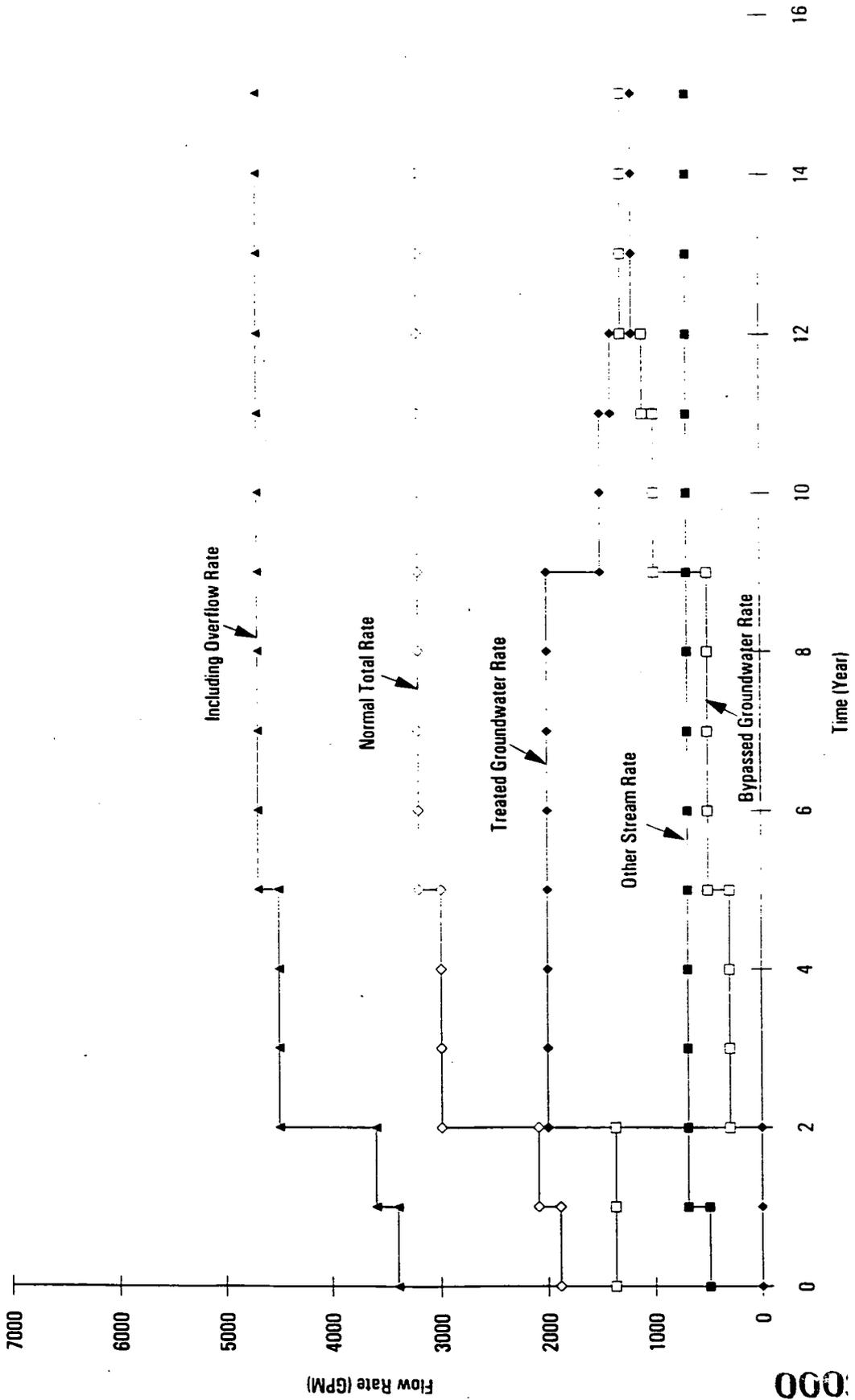
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Groundwater Extraction/Treatment/Bypass - Lower Rate (Option II)

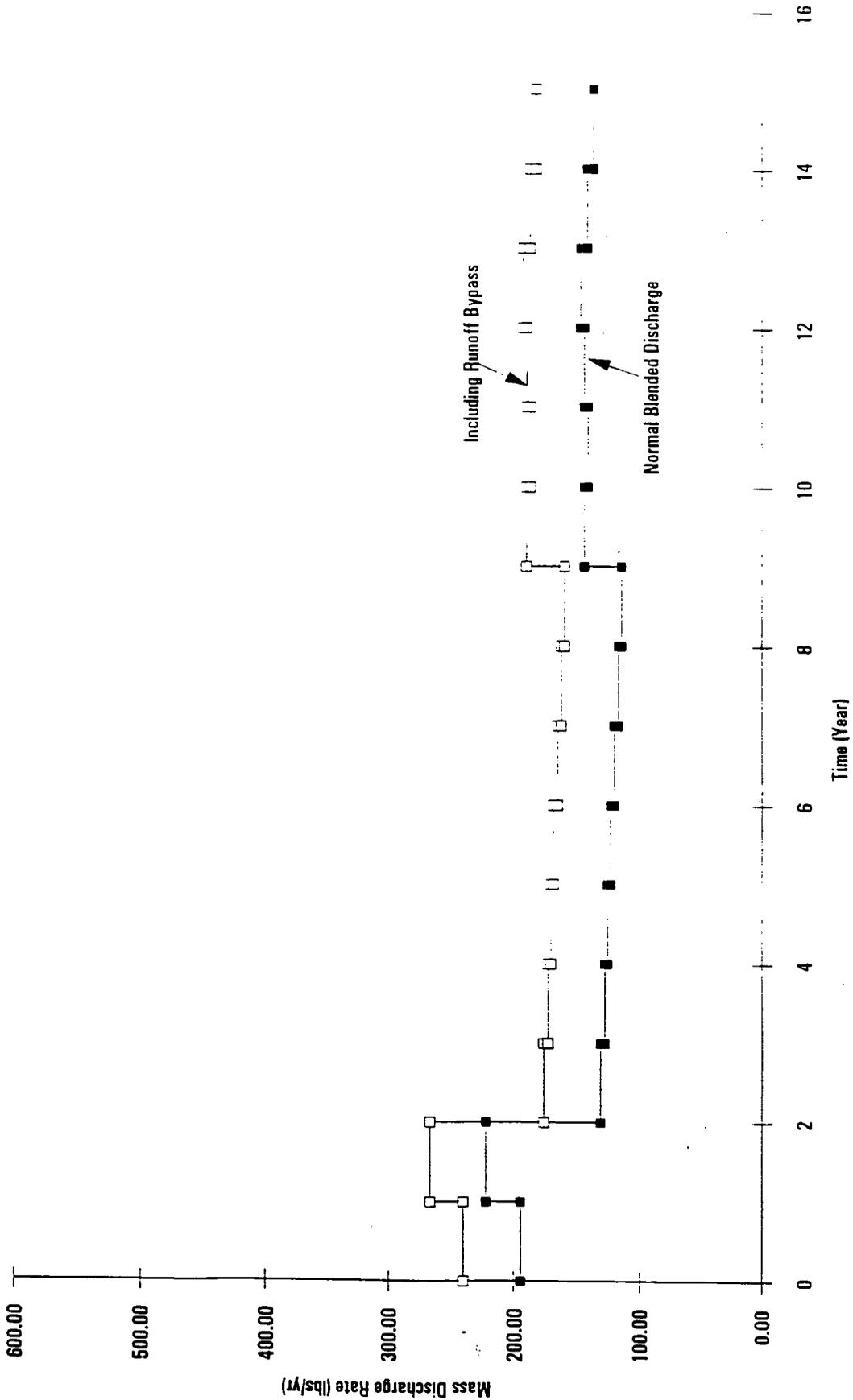


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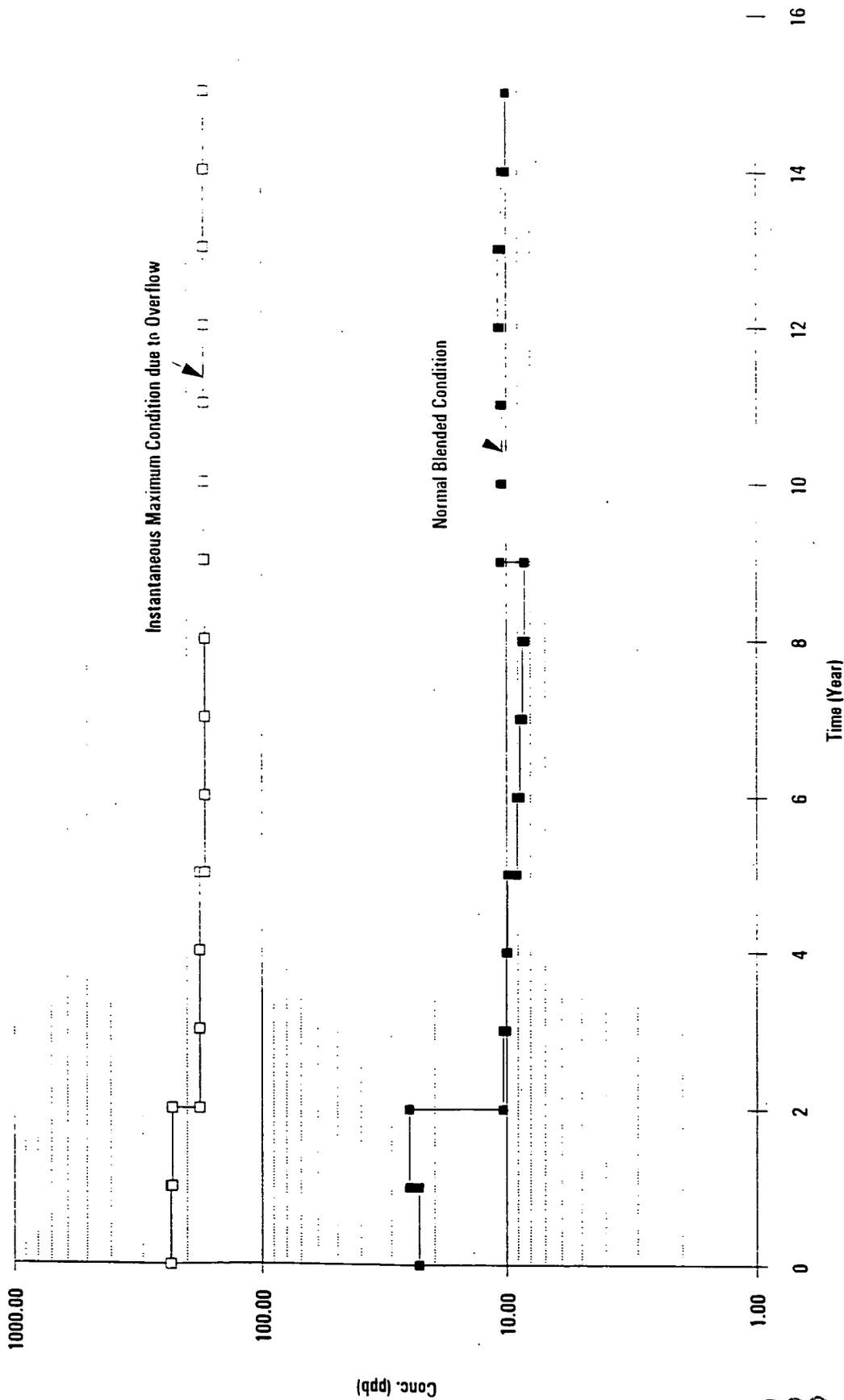
Outflow Flow Rate - Lower Rate (Option II)



Outfall Annual Mass Discharge Rate - Lower Rate (Option II)



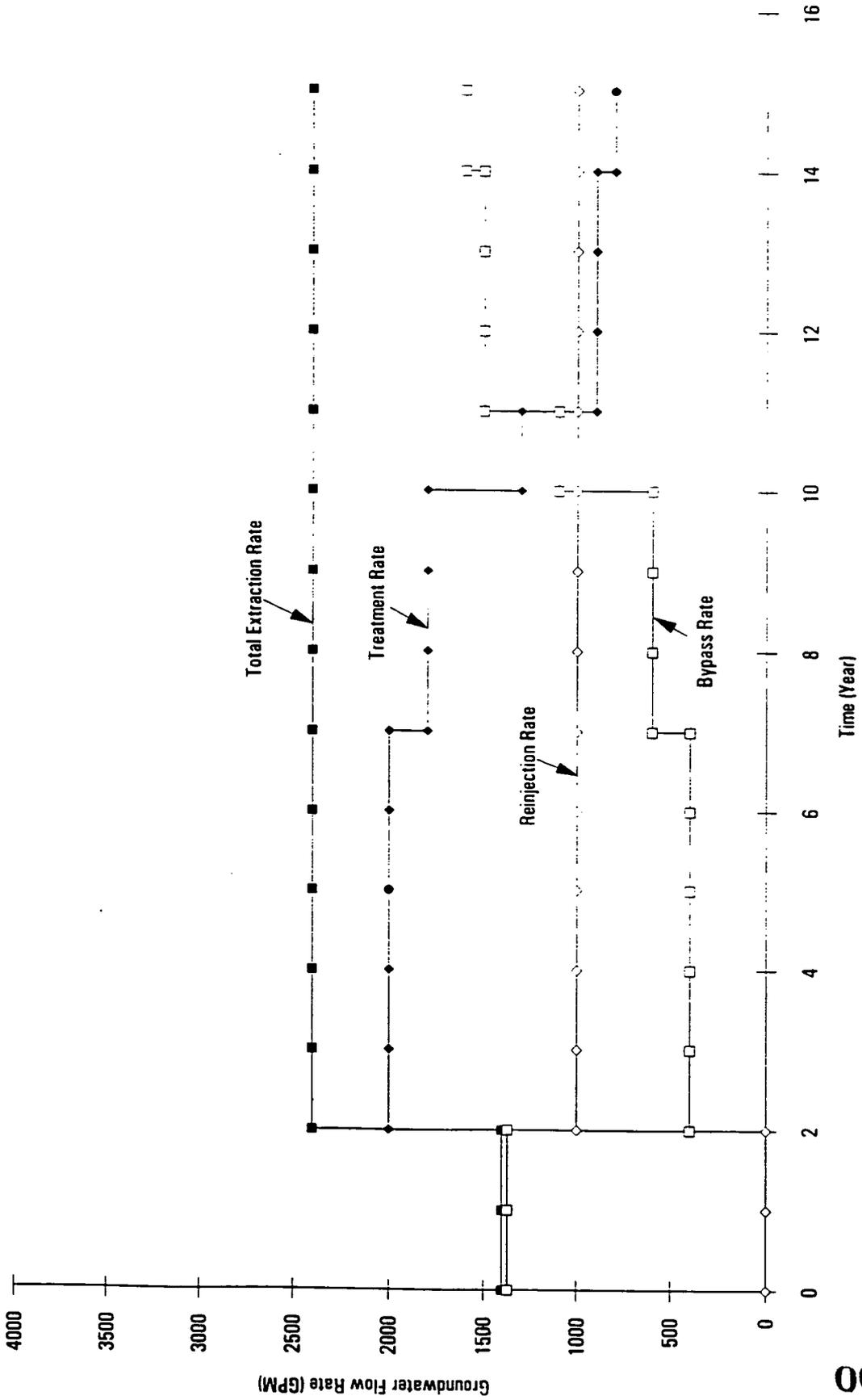
Outfall Concentration - Lower Rate (Option II)



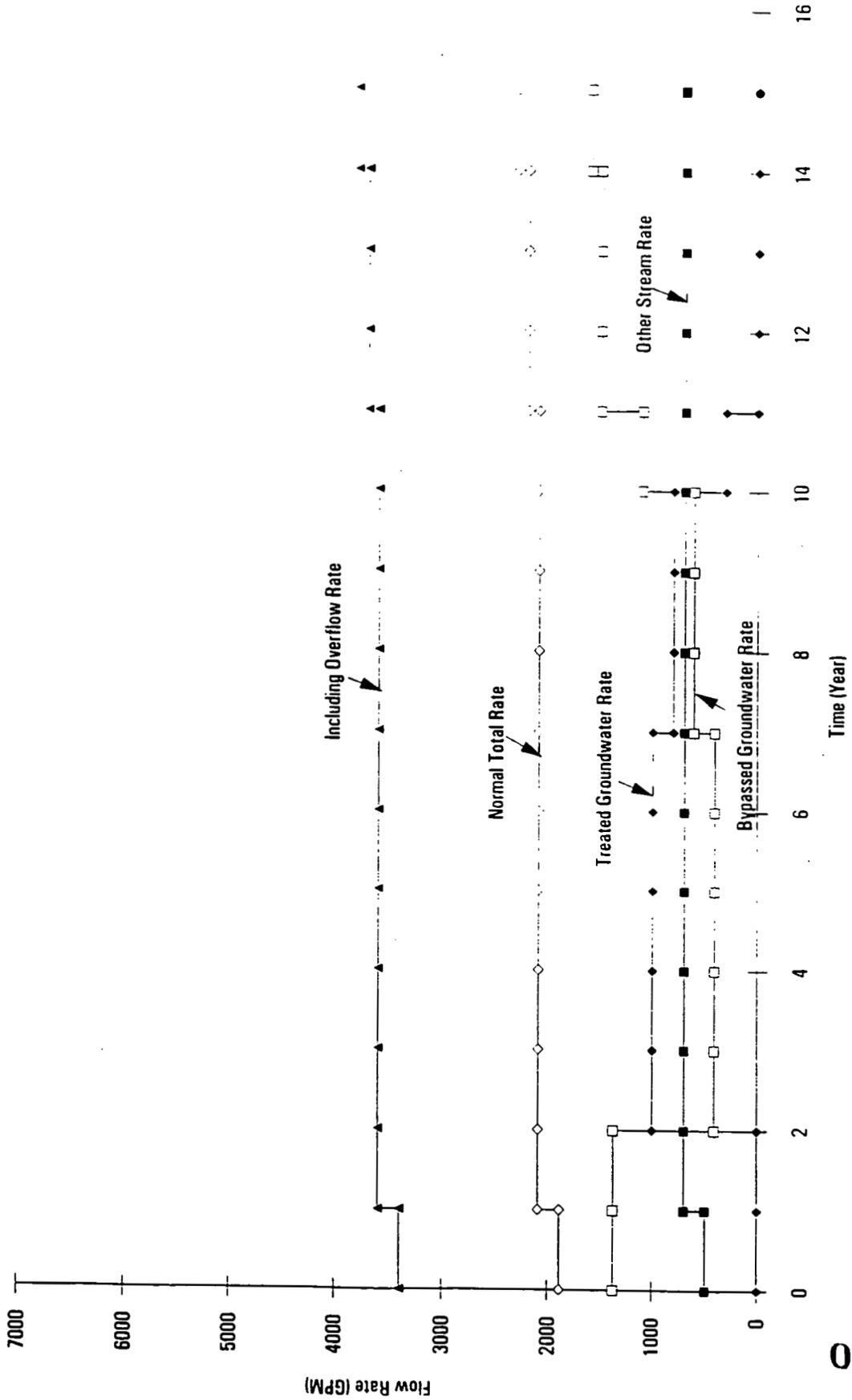
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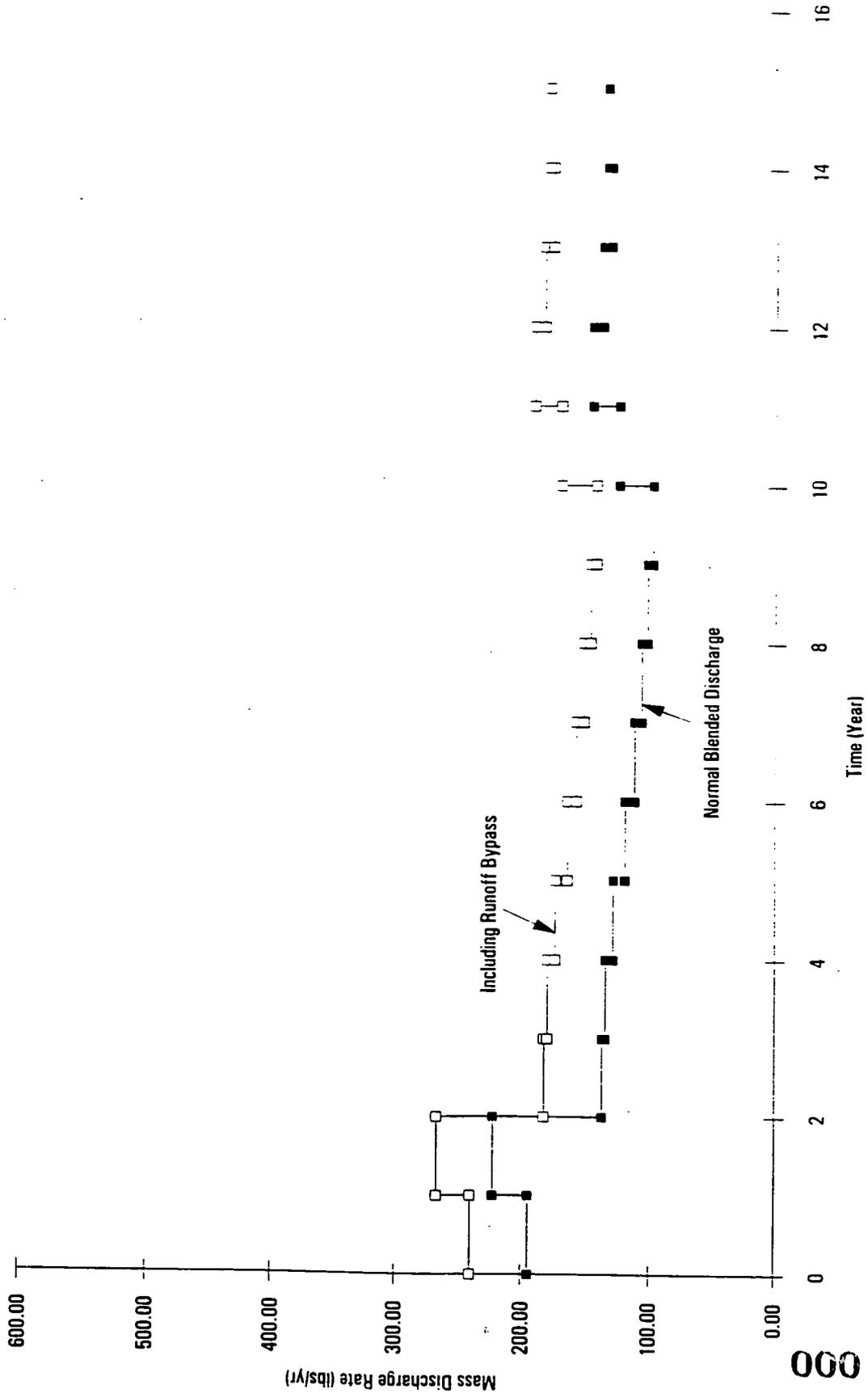
Groundwater Extraction/Treatment/Reinjection/Bypass - Optimization Rate (Option III)



Outflow Flow Rate - Optimization Rate (Option III)

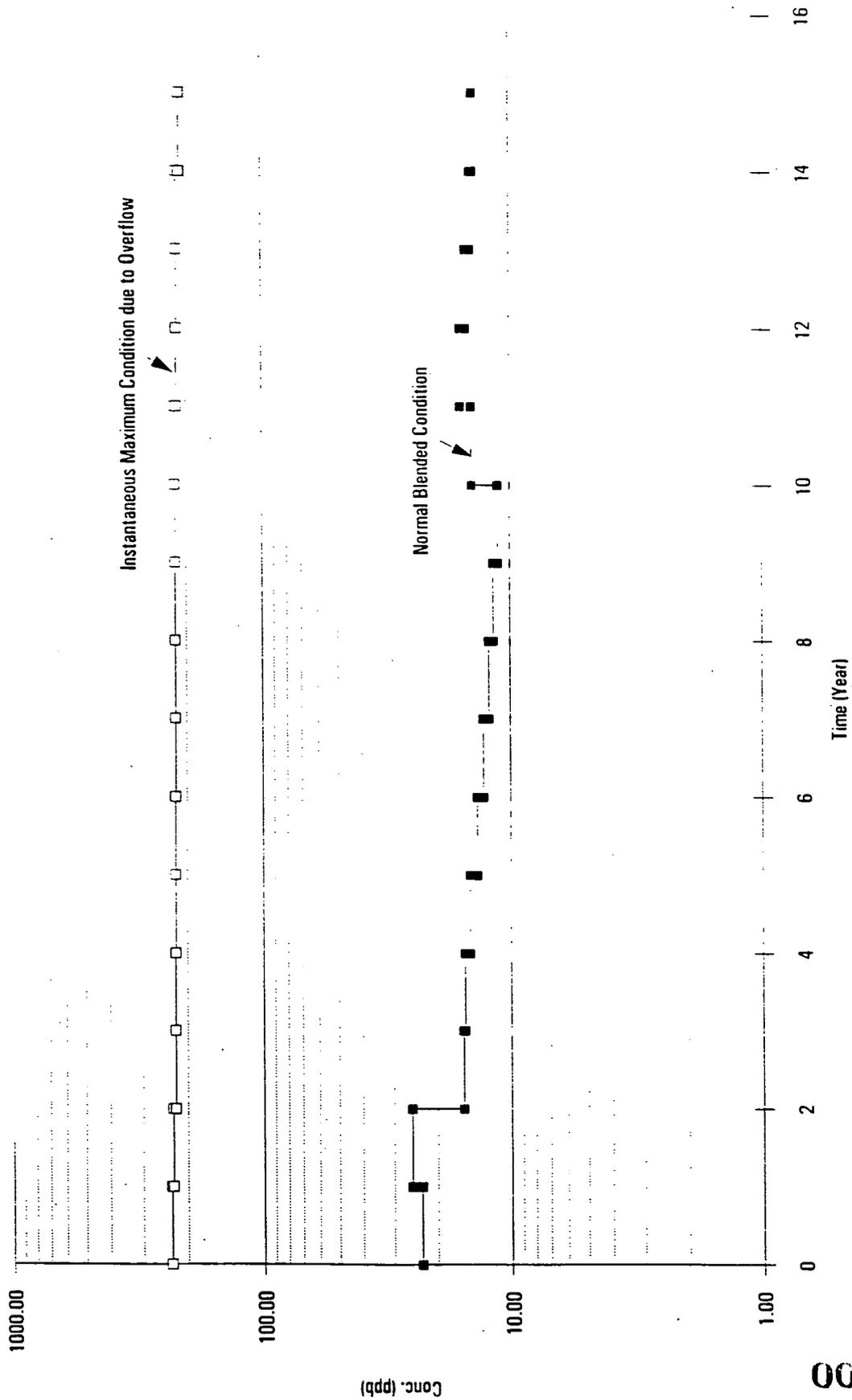


Outfall Annual Mass Discharge Rate - Optimization Rate (Option III)



99,000

Outfall Concentration - Optimization Rate (Option III)



57 000

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PROJECTED IMPACTS TO THE GREAT MIAMI RIVER

6.0 SUMMARY

KEY CONTROLLING FACTORS OF THE OUTFALL CONDITIONS

<u>FACTOR</u>	<u>CHARACTERISTIC/UNCERTAINTY</u>
Overflow Events And Associated Concentrations	Difficult To Control And With High Uncertainty
Groundwater Extraction Rate Directly In The Hot Spots	Can Be Controlled And With Low Uncertainty
Reinjection Of Treated Groundwater	Can Be Controlled And With Low Uncertainty

IMPACTS TO THE GREAT MIAMI RIVER

- River Concentration Will Not Exceed The FRL.
- Mass Discharge Will Not Exceed The 600 Lbs/Yr Limit.
- Outfall Concentration Will Exceed the MCL Before Treatment Capacity Is Expanded, Due To Overflow Events, Or Combining Higher Extraction Rate (i.e., Over 2500 GPM) With Optimization During STAGE I.

FEMP Wastewater Treatment System Descriptions

Introduction:

The following information is presented in order to give a summary level understanding of the existing and currently planned wastewater treatment systems, their sources, and discharges. The systems presented include the Advanced Wastewater Treatment System (AWWT) - Phases I and II, The Interim Advanced Wastewater Treatment System (IAWWT), South Plume Interim Treatment (SPIT), and the currently planned AWWT Expansion.

The effluents from these systems along with Sewage Treatment Plant effluent and by-passed (untreated) groundwater will combine at manhole 176B to form the FEMP Sites regulated discharge of uranium to the Great Miami River (GMR). This system description is intended to aid in the development of specific mass and concentration based limitations for the FEMP discharges to the GMR.

Description of Systems:

AWWT Phase I. This system is intended to be used primarily for the treatment of uranium contaminated stormwater runoff from the former production areas of the FEMP site, however, when no stormwater is available this system will be utilized to treat the less contaminated groundwater from aquifer remediation efforts. This system was designed as a 700 gallon per minute (gpm) treatment system, however, a more realistic nominal throughput rating of this system is 600 gpm on an annual average basis. This downrating of system capacity takes into account downtime for major maintenance activities and unplanned system shutdowns.

Of the nominal 600 gpm flows, it is estimated that approximately 50% will be dedicated to treatment of stormwater and 50% will be dedicated to treatment of groundwater (i.e. 300 gpm each on an estimated annual average flow rate). At the present time, this system is only capable of a sustained throughput of approximately 400 gpm. Replacement of the existing Multi-tube filtration system in mid-1996 will allow this system to achieve the nominal 600 gpm flow.

As mentioned above, the sources to this system are contaminated stormwater runoff and CRU5 remediation groundwater. Historically, the stormwater discharges to the Stormwater Retention Basin (SWRB) contains approximately 500 ppb uranium while the South Plume groundwater currently being pumped is somewhat less than 20 ppb. This differential in concentration illustrates the treatment philosophy of preferentially treating stormwater over groundwater. However, if future groundwater remediation concentrations exceed that of stormwater runoff, the priority would be reversed.

Based on initial system operational experience, it is estimated that this treatment system will be capable of maintaining a system effluent at approximately 10 ppb uranium.

It should be noted that during periods of exceptionally high rainfall, the AWWT Phase I may not be able to keep up with the inflow to the SWRB.

Therefore in order to prevent an overflow of stormwater to Paddy's Run, stormwater will be by-passed directly to the Great Miami River. This is assumed to occur for approximately 5 days per year at flow rate of 1500 gpm and a uranium concentration of 500 ppb.

It is assumed that future wastewater flows from the CRU2 Disposal Cell would be directed to this treatment system since these flows will essentially be derived from stormwater and will require some surge capacity. This capacity is anticipated to be provided by the existing stormwater retention basin as well as the cell itself. However, it should be noted that no additional drainage areas can be added to the area draining to the SWRB until areas declared as "clean" are diverted away from the SWRB.

AWWT Phase II. This system is intended to treat the existing FEMP site "process wastewaters" and future remediation wastewater flows. The existing flows include all wastewaters requiring uranium removal that are currently directed to the Bionitrification Surge Lagoon (BSL), including waste pit area stormwater runoff and contaminated general sump flows. Future remediation flows from CRUs 1 - 4 are intended to be directed to the BSL in order to take advantage of the lagoons 8 million gallon flow and concentration equalization capability. The Phase II system was designed as a 400 gpm system, however, inefficiencies inherent to the design have limited the expected throughput to approximately 300 gpm. Of this 300 gpm available capacity approximately 100 gpm is expected to be consumed by existing process wastewater average annual flows. The remaining 200 gpm is available for the treatment of remediation flows. However, if capacity exists, CRU5 Remediation groundwater can be directed to this system for treatment. However, treatment projections do not assume any groundwater treatment by the Phase II system. At the present time, this system is only capable of a sustained throughput of approximately 200 gpm. Replacement of the existing Multi-tube filtration system in mid-1996 will allow this system to achieve the nominal 300 gpm flow.

Current flows from the BSL have a uranium concentration of approximately 1000 ppb and it is assumed that future additions of remediation wastewater will not alter this concentration significantly. Based on initial system operational experience, it is estimated that this system will be capable of maintaining a system effluent of approximately 20 ppb uranium.

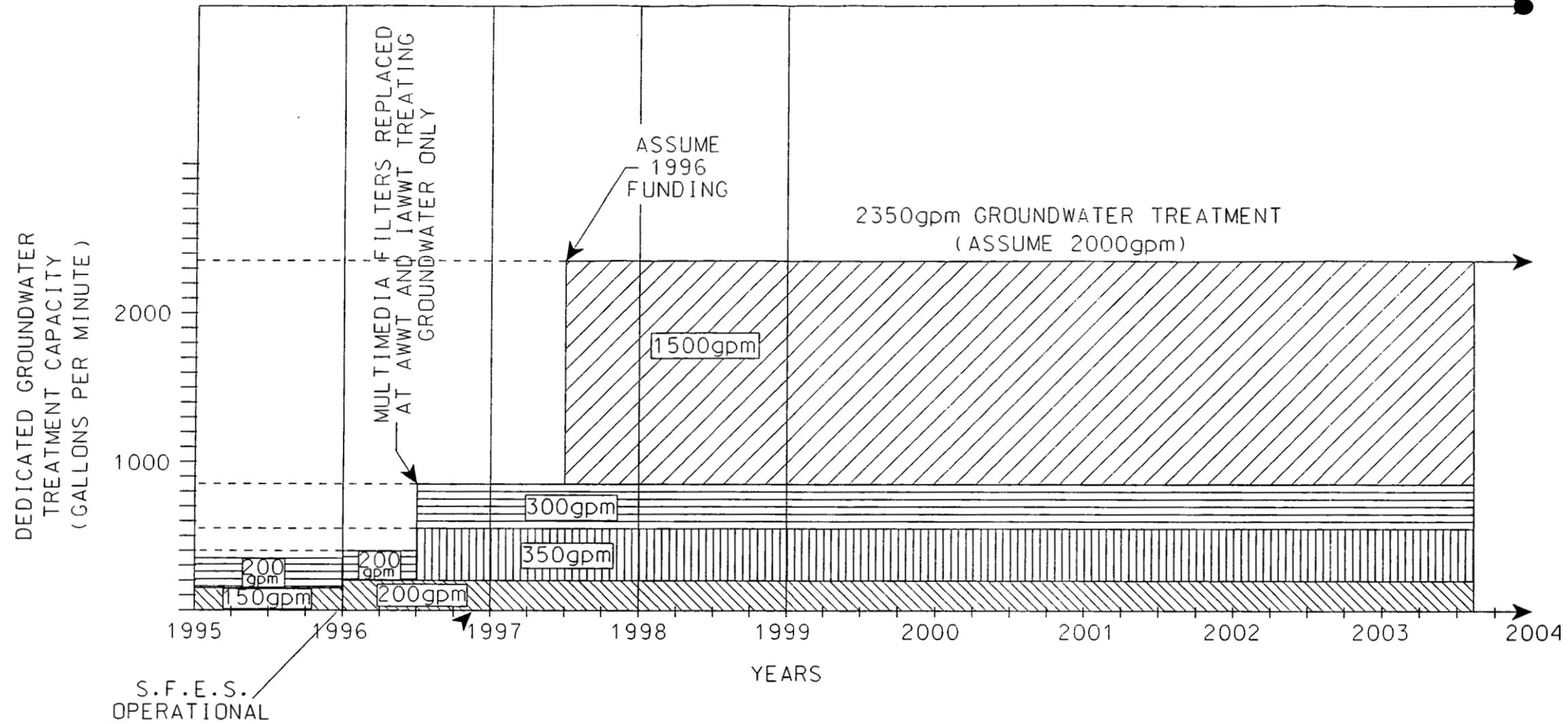
IAWWT. This treatment system was designed as a 300 gpm treatment system to treat uranium contaminated stormwater prior to the installation of the AWWT Phase I system. As originally planned, this system was to be decommissioned once full treatment of stormwater was achieved by the AWWT Phase I, however, current plans utilize this system for CRU5 groundwater treatment. In its new role as a groundwater treatment system, the IAWWT through put will be increased to approximately 400 gpm. However, the annual average flow rate is expected to be closer to 350 gpm dedicated to treatment of groundwater. Operational experience has shown that this system can achieve an effluent uranium concentration of 5 ppb.

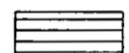
This system is currently still needed for treatment of stormwater runoff as the AWWT Phase I system is not up to full capacity. Stormwater treatment at the IAWWT is expected to be required until the AWWT Multi-Media Filter Project is completed in mid-1996. At present, the flow through this system is limited to approximately 250 gpm due to excessive pressure drop across the ion exchange vessels, however, this resin is scheduled to be changed out and the vessel strainers overhauled. This maintenance work will return this system to its full flow capacity.

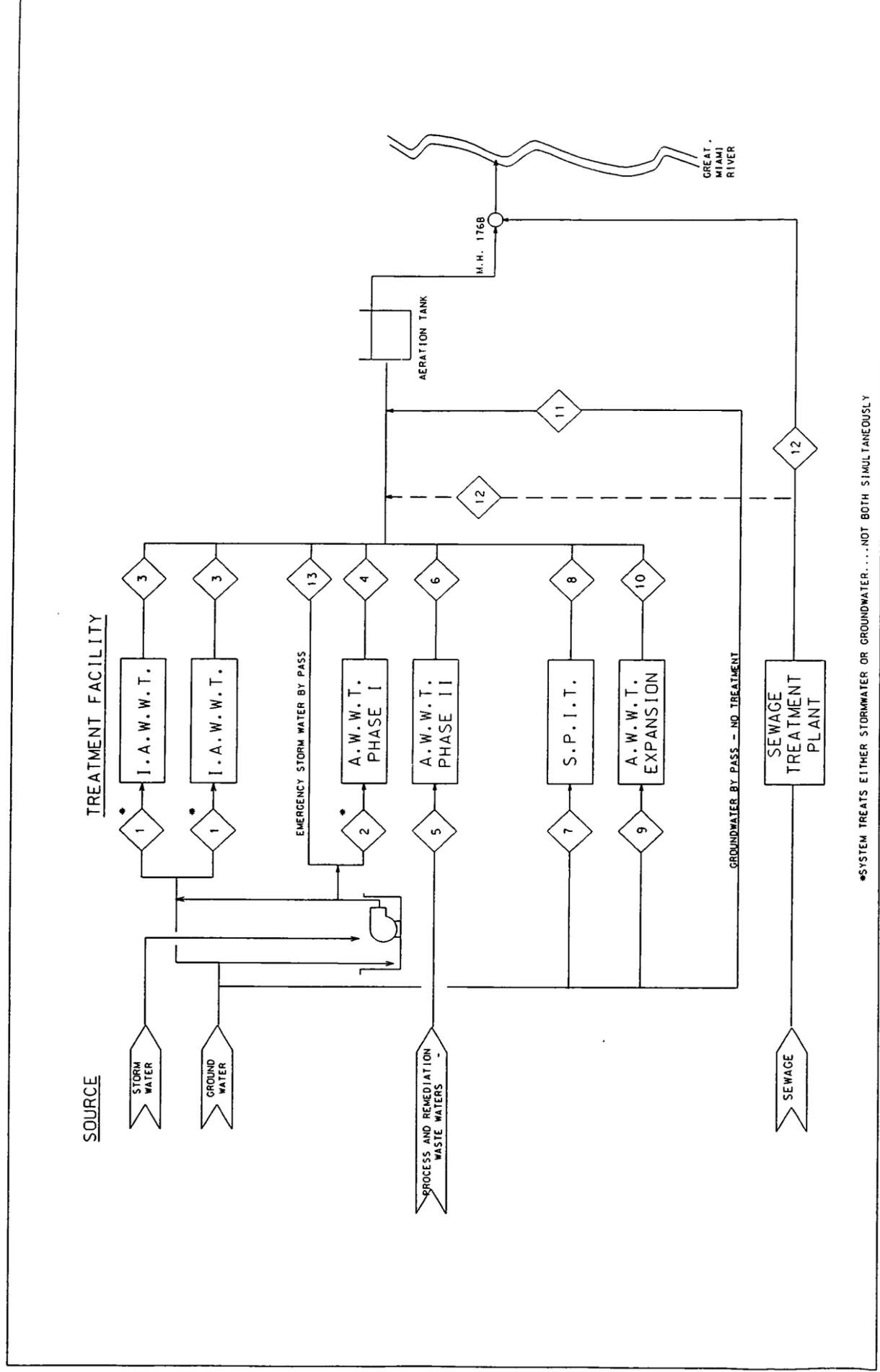
SPIT. The SPIT system is a 200 gpm treatment system dedicated to treatment of CRU5 Groundwater only. This system currently has a throughput of approximately 150 gpm due to excessive differential pressure across the ion exchange vessels, however, this system will have the strainers overhauled and the resin changed out in order to achieve full capacity.

This system will continue to be dedicated to treatment of CRU5 groundwater at 200 gpm and has shown that an effluent concentration of 5 ppb can be expected.

AWWT Expansion. This treatment system is currently in the design phase. The current design is for a treatment system dedicated to CRU5 groundwater and a throughput of 1800 gpm. It is anticipated that this treatment system will be able to process approximately 1500 gpm on an annual average basis. This planned reduction from full capacity takes into account downtimes for scheduled maintenance and unplanned interruptions of flow. Since this new system is very similar in design to the SPIT system, it is expected to perform similarly. Therefore, an effluent uranium concentration of 5 ppb can be expected.



-  SOUTH PLUME INTERIM TREATMENT (SPIT) - NOMINAL CAPACITY = 200gpm.
-  I.A.W.W.T. TRAILERS - NOMINAL CAPACITY = 350gpm
-  A.W.W.T. PHASE I - NOMINAL CAPACITY = 600gpm (TREATS STORMWATER HALF THE TIME AND GROUNDWATER HALF THE TIME)
-  A.W.W.T. EXPANSION. NOMINAL CAPACITY = 1500gpm (ASSUMES THE PROJECT FUNDED IN 1996)



*SYSTEM TREATS EITHER STORMWATER OR GROUNDWATER...NOT BOTH SIMULTANEOUSLY

STREAM NO.	1	2	3	4	5	6	7	8	9	10	11	12	13
	GW/SW TO IAWWT	GW/SW TO AWWT PHASE I	IAWWT EFFL.	AWWT PHASE I EFFL.	PROCESS WASTE TO AWWT PHASE II	AWWT PHASE II EFFL.	GW TO SPIT	SPIT EFFL.	GW TO AWWT EXP.	AWWT EXP. EFFL.	GW BYPASS	STP EFFL.	EMRG SWRB BYPASS
	125 STORM	200/200	125	400	200	200	150	150	NA	NA	1050	90	1500*
	500	<20/500	5	10	1000	20	<20	5	NA	NA	<20	96	500
NOTES:													* ASSUMES 5 DAY PER YR. ONLY
	175 GW	300/300	175	600	300	300	200	200	NA	NA	TBD	90	1500*
	<20		5	10	1000	20	<20	5	NA	NA	TBD	96	500
NOTES:	ASSUMES INSTALLATION OF MULTIMEDIA FILTERS AT AWWT BY 6/96 AND INSTALLATION OF AWWT EXPANSION BY 6/97												
	175 GW	300/300	175	600	300	300	200	200	1500	1500	TBD	90	1500*
	TBD	TBD/500	5	10	1000	20	TBD	5	TBD	5	TBD	<5	500
NOTES:	ASSUMES FUNDING AND STARTUP OF AWWT EXPANSION BY 6/97. ASSUMES START OF S.F.E.S. PUMPING BY 6/97 AND ASSUMES RELOCATION OF SEWAGE TREATMENT PLANT												

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