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**Department of Energy**  
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MAY 5 2004

Mr. James A. Saric, Remedial Project Manager  
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Region V, SR-6J  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

DOE-0247-04

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

Dear Mr. Saric and Mr. Schneider:

**PATH FORWARD FOR THE "CONVERSION" OF THE ADVANCED WASTEWATER TREATMENT FACILITY AT THE FERNALD CLOSURE PROJECT**

Over the past several months, discussions have been held with public stakeholders, the regulatory agencies, and other key decision makers regarding a decision for a more cost effective alternative water treatment facility for use over the long term for accomplishing groundwater restoration at the Fernald Closure Project (FCP). The process has led to support for a plan of action to "carve down" the 2,600-gallon per minute (gpm) Advanced Wastewater Treatment (AWWT) facility to permit the 1,800 gpm Phase III Expansion System to remain as the long-term facility. This plan would permit the D&D and soil remediation of about 90 percent of the footprint of the existing AWWT facility, the placement of the affected materials in the On-Site Disposal Facility (OSDF), and result in a protective, more cost effective long-term water treatment facility to complete aquifer restoration.

Originally, the FCP proposed the concept of a 1,100 gpm replacement plant that would consist of an upgraded South Plume Interim Treatment/Interim Advanced Wastewater Treatment (SPIT/IAWWT) facility coupled with a new 600 gpm groundwater treatment module installed adjacent to the SPIT/IAWWT facility. In their technical review of the SPIT/IAWWT replacement plant proposal, the U.S. and Ohio EPA requested that an additional 600 gpm of capacity be added, primarily for assurance purposes to further bolster against long-term treatment uncertainties and provide additional treatment flexibility. This additional capacity request contributed to the idea behind "carving down" the AWWT facility to preserve the 1,800 gpm Phase III Expansion System as the long-term

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Mr. Tom Schneider

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facility. In essence, the 1,800 gpm system would provide for about 600 gpm of storm water capacity (including carbon treatment) to handle the last remaining storm water flows, and, once those flows have ceased, a dedicated long-term groundwater treatment capacity of up to 1,800 gpm.

Modeling projections and extraction-well concentration decline curve analyses have indicated that this revised configuration of water treatment capacity can, over the long term, continue to satisfy performance-based discharge limits contained in the existing Operable Unit 5 Record of Decision (ROD). The plan would also continue to meet and exceed the 4,000 gpm target aquifer pumping rate discussed in the Operable Unit 5 ROD.

DOE remains committed to achieving the current performance-based discharge limits contained in the Operable Unit 5 ROD, and recognizes these limits to be the necessary operational goals for design of the replacement system. DOE also recognizes and remains committed to the continued application of the existing storm water bypass constraints (e.g., 10 annual bypass allowance days to accommodate periods of significant precipitation) contained within the Operable Unit 5 ROD. Although it is determined not feasible to maintain long-term operations of the groundwater injection wells beyond 2004, DOE is committed to exploring alternate efficient ways for continued groundwater reinjection. DOE recognizes as a leading reinjection alternative candidate, the idea raised by the regulatory agencies at the March 18 2004 technical meeting. This idea would use clean groundwater, made available from the FCP's construction-water and dust-control wells, as a potentially acceptable source of reinjection water that could be introduced to the affected portions of the aquifer via the Storm Sewer Outfall Ditch (SSOD) and its tributaries to further enhance the aquifer restoration activity. This candidate idea is now undergoing technical evaluation, and DOE will arrange for a follow-up meeting with the agencies to discuss the results and the possibilities of implementing this approach as part of the "carve down" strategy.

Enclosure 1 to this letter contains the actions and written schedule necessary to support the carve down of the AWWT approach, and the accompanying performance requirements that all parties agree must be met in order to proceed with the approach. Ideally, field implementation of this approach starting with temporary shutdown of the Phase III Expansion System for necessary piping modification will be initiated no later than the fall of 2004. Enclosure 2 provides a timeline for the AWWT conversion project and Enclosure 3 contains text from the current Operations and Maintenance Master Plan pertaining to what actions are to be taken in the event that uranium discharge limits are exceeded.

Regarding recent concerns raised by OEPA about a possible delay of the Silos Project and the effect that delay may have on other projects at the Site, DOE would like to emphasize that a delay in the Silos Project schedule will not adversely affect the completion of the other projects at Fernald by the end of 2006. The closure date for the OSDF will be maintained as presently planned for December 2006 in the event the Silos Project shipment cannot be initiated by the summer of 2006.

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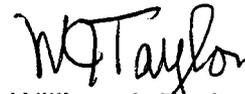
Mr. James A. Saric  
Mr. Tom Schneider

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If you have any questions or require additional information, please contact Johnny Reising at (513) 648-3139.

Sincerely,

  
William J. Taylor  
Director

FCP:Reising

Enclosures: As Stated

cc w/enclosures:

L. Lojek, OH/FCP  
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R. Vandegrift, ODH  
AR Coordinator, Fluor Fernald, Inc./MS78

cc w/o enclosures:

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**Enclosure 1**

5/4/04

As evidenced by the discussions at the February 18, 2004 meeting between the Department of Energy (DOE), the U. S. Environmental Protection Agency (EPA), and the Ohio EPA (OEPA); the February 18, 2004 Citizens Advisory Board meeting; and the follow-up March 18, 2004 meeting with U.S. and Ohio EPA, it is the consensus desire of the involved parties to achieve the benefits associated with the "carve down" of the Advanced Wastewater Treatment (AWWT) facility and the placement of the debris and underlying impacted soil in the On-site Disposal Facility (OSDF). While the ability to achieve these benefits is desirable, the involved parties also indicated a desire to minimize any potential undue impacts to the Great Miami River (GMR) and the progress of the ongoing groundwater restoration activity. To this end, DOE will implement the "carve down" of the AWWT facility under the design, construction, and start-up schedule shown provided as part of this Attachment, as the means to minimize service interruptions from the existing 2,600 gpm facility, and assure a smooth operating transition to the remaining new/modified 1,800 gpm facility. In this approach the storm water treatment capacity will be maintained at 600 gpm or higher throughout the process until the end of soil remediation.

In support of the "carve down" approach, DOE also commits to the following actions in addition to (or consistent with) the Operable Unit 5 Record of Decision (ROD):

1. Capture Zone Evaluation Test Plan. This plan will identify the methods to be used for an evaluation of the extraction well field capture zone and potential stagnation zones along the southern property line (the area where the injection wells currently reside) within the first year of operation of the replacement facility. The evaluation will focus on the field verification of the impacts, if any, of terminating well-based injection operations after the AWWT facility enters its "carve down" state. The stagnation zones of interest are the areas where the off-property South Plume Optimization well field and the on-property Southfield well field compete for water, which lessens localized groundwater flow gradients as a result. The initial test plan including a proposed implementation schedule will be submitted by July 1, 2004.
2. Adjustment of the pumping rates to ensure capture or to address stagnation zones in response to the results of the above evaluation. Pumping rate adjustments as a means to ensure capture and to address stagnation zones will be specified in a future revision of the Operation and Maintenance Master Plan (OMMP) For The Aquifer Restoration and Wastewater Project after completion of the work specified in the Capture Zone Evaluation Test Plan (Action Item 1).
3. Storm Sewer Outfall Ditch Reinjection Test Plan. This plan will identify the methods to be used for an evaluation of releasing clean groundwater flow (i.e., generated from Fernald's construction water and dust control wells) into the Storm Sewer Outfall Ditch (SSOD), as a means to enhance aquifer recharge with a resultant further enhancement of the groundwater restoration activity. The evaluation will focus on reaffirming that the long-term pumping from the

clean wells will not detrimentally affect plume gradients and flow patterns, as well as evaluating the beneficial impacts of introducing clean infiltration water to the affected area through the SSOD and its tributaries. The initial test plan including a proposed implementation schedule will be submitted by July 1, 2004.

4. The submission of a letter under the Discharge Changes Clause of the existing NPDES Permit that provides a comparison of the hydraulic capacities and unit operations between the existing AWWT facility and the "carved down" facility, and a demonstration that an NPDES Permit modification would not be required due to no impact on water quality discharged to the Great Miami River as a result of this change. This letter will be submitted by June 3, 2004.
5. DOE will develop a plan to manage OSDF leachate after the Bio-Surge Lagoon is taken offline for excavation in November 2004. The plan will be incorporated into the next revision of the OMMP scheduled to be submitted for EPA and OEPA review and approval by July 2, 2004.
6. DOE will develop a plan to manage the remaining impacted storm water during the short period after the storm water retention basins are taken offline for excavation (November 2005) and before the OSDF is completely capped (Spring 2006). This plan will be developed as an addendum to the revised OMMP and be submitted for EPA and OEPA review and approval by August 1, 2005.
7. DOE will also continue to explore ways to enhance the overall aquifer restoration activity through such measures as pulse pumping, as the site moves to post-closure. This commitment will be re-iterated in the next revision of the OMMP.
8. As specified in Section 9.1.5 of the Operable Unit 5 Record of Decision, groundwater treatment will continue until both the 30 ppb monthly average uranium discharge limit and the 600 pounds per year uranium discharge limit can be met without treatment. When treatment of groundwater is no longer required to meet the discharge limits, the water treatment facility will be placed in a standby configuration. DOE will obtain EPA approval of the date when the treatment facility can be placed in a standby configuration. After a to-be-determined standby period, and following a joint DOE and EPA determination that the groundwater treatment facility is no longer needed, the facility and associated infrastructure will be removed. The impacted facility debris and associated impacted soil will be disposed of off site.
9. DOE will submit a groundwater certification plan for EPA and OEPA review and approval by the end of 2005.
10. The SPIT and IAWWT treatment facilities are currently scheduled to remain online until July 2005. All parties recognize that the SPIT and IAWWT facilities will provide supplemental treatment capacity during the period after the converted AWWT facility comes online and the AWWT Phases I and II systems are shut down to accommodate the Stage II construction - beginning in February 2004. A decision to permanently remove the SPIT and IAWWT facilities from

service however, will be contingent upon EPA approval. EPA's approval will be based on the performance of the converted AWWT facility in handling the storm water and remediation wastewater treatment needs without adversely impacting the desired groundwater pumping rate.

It is recognized that exceptional operating conditions can occur during the construction and initial operation of the revised configuration, and that a stabilization period will be necessary to bring the "carved down" system on line until such time that the reconfigured system operates in a consistent manner without process interruptions or widely varying effluent concentrations. These exceptional operating conditions may result in intermittent or temporary excursions in discharge levels above the performance-based limits established for Fernald's outfall to the Great Miami River.

The Fernald Closure Project (FCP) will employ a good faith effort to construct and stabilize the revised treatment system and achieve the performance-based discharge limits as currently allowed. The language in Section 3.6.2 of the Aquifer Project OMMP (included as Attachment 3) recognizes and defines the stepwise operational actions to be taken when excursions demonstrate a set pattern for a sequence of months. The FCP will maintain a good faith effort to implement those stepwise actions should the 30 ppb monthly average and/or 600 lbs per year operational targets be exceeded. The FCP will also continue to maintain the current priority-based decision logic for identifying which individual wastewater and groundwater flow streams require priority treatment ahead of other flow streams, as described in the OMMP.

In the discussions on February 18, 2004, the need was identified to manifest this change through the use of a Memorandum to the Post ROD Site File (e.g., the RD/RA Case File) as described in EPA's 1999 *Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (OSWER Directive 9200.1-23P), with an accompanying Remedial Design Fact Sheet for the public. This fact sheet would document the basis for the change consistent with all the recent meeting discussions. DOE will forward to both agencies a first draft of the proposed fact sheet by June 3, 2004 for regulatory review and approval.

## CAWWT - Proposed Implementation Schedule

10/20/03 – 8/02/04: Regulatory/Stakeholder Approval Process

3/2/04 - 2/05: Design

- Stage I Design 3/04 - 7/04
  - 60% Design by 4/30/04
- Stage II Design 3/04 - 2/05

6/04 - 8/05: Procurement

- Stage I Procurement complete 12/04
- Stage II Procurement complete 8/05

6/04: Begin Procurement - long lead items

9/04 – 12/04: Stage I Construction

2/05 – 8/05: Stage II Construction

9/04: Begin Stage I "Outside" Construction

- Work that can be done prior to AWWT Expansion shutdown

10/1/04 – 2/1/05: Shut down AWWT Expansion for Conversion

- Site Water Treatment Capacity reduced to 1000 – 1300 gpm
  - 800 gpm storm water/remediation wastewater capacity for peak flows
  - 200 gpm dedicated to groundwater (Anticipate ~600 gpm average groundwater treatment)
  - Stop groundwater re-injection (10/01/04)
  - Reduce groundwater pumping to ~3000 gpm (from > 4000gpm)

10/1/04 - 12/31/04: Stage I "Inside" Construction

- Work that has to be completed during AWWT Expansion shut down

10/1/04 – 1/31/05: Prepare Operational Documentation

11/1/04: Re-route of Leachate/Storm water to SWRB is complete and BSL is shut down for D&D and Excavation

12/31/04: Stage I Construction complete

1/3/05 – 1/17/05: Conduct SOT and train operators

1/18/05 – 1/20/05: Conduct SSR

1/21/05 – 1/27/05: Address issues raised in SSR

2/01/05: Begin full-scale operation of Converted AWWT Expansion

- Site water treatment capacity increased to ~2000 gpm
  - 600 gpm storm water/remediation wastewater capacity available
  - 1400+ gpm capacity available for groundwater treatment (SPIT + Converted Expansion)
  - Increase groundwater pumping to >4000 gpm
- Shutdown AWWT Phases I & II for selective D&D and excavation
- Continue operating Slurry Dewatering Facility (SDF) in support AWWT shut down and Silos
- Begin D&D and excavation of AWWT footprint outside of converted expansion/SDF

2/1/05 – 8/1/05: Stage II Construction: Remove AWWT Phase I&II equipment – Add lab, office, control room, restroom, and any required solids handling equipment

7/1/05: Shut down SPIT/IAWWT for D&D and excavation

- Site water treatment capacity decreased to ~1800 gpm
  - 600 gpm storm water/remediation wastewater capacity available
  - 1200+ gpm capacity available for groundwater treatment

11/1/05: Shutdown SDF for D&D and excavation

- Silos water Treatment complete

Shutdown SWRB for D&D and excavation

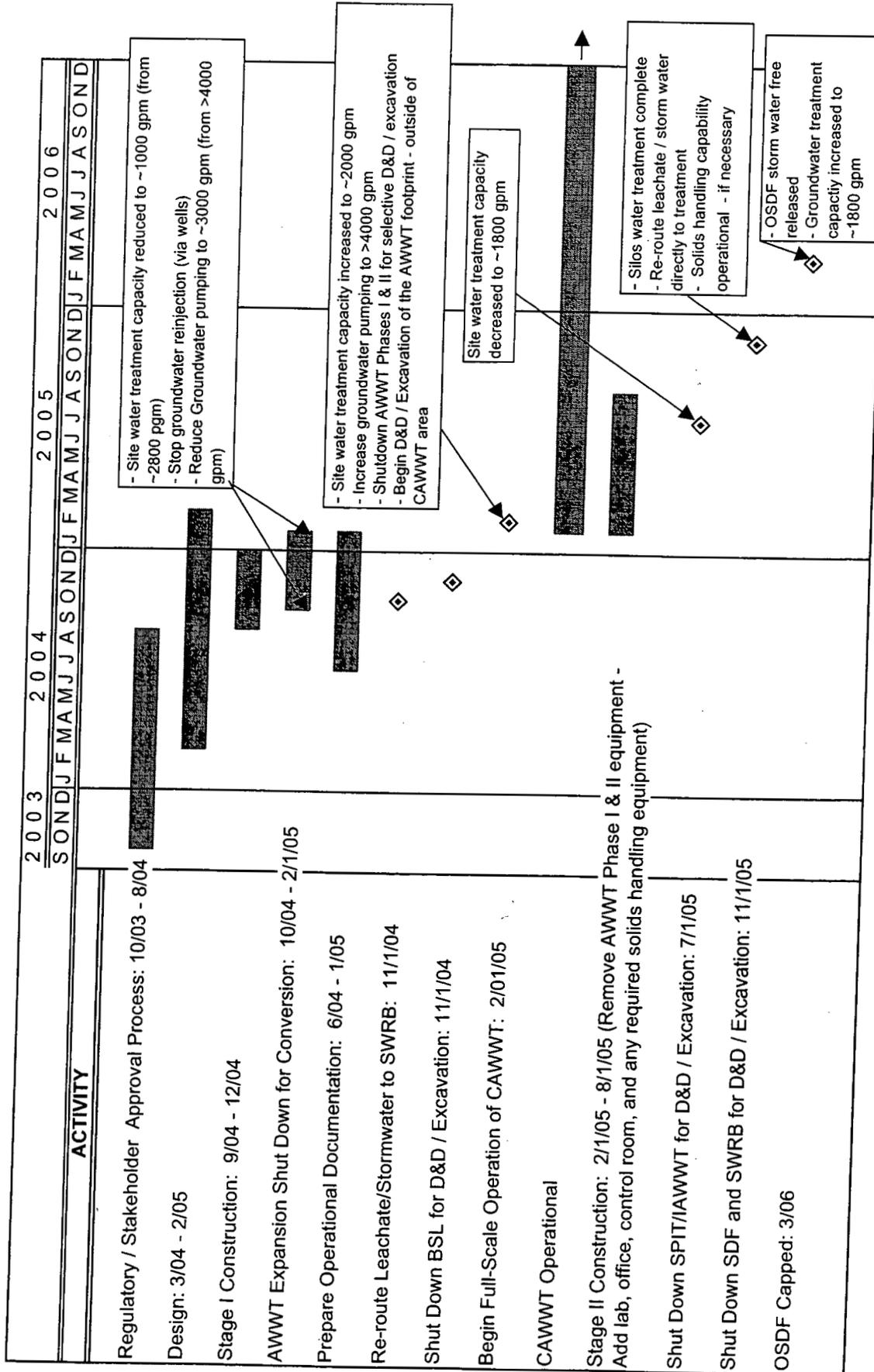
- Re-route of OSDF leachate/storm water directly to treatment complete
- SW & RWW Clarification/waste handling capability operational – if necessary

3/06: OSDF capped sufficiently such that OSDF storm water can be routed to free release

Groundwater treatment capacity increased to ~1800 gpm

Potential re-injection of treated groundwater in SSOD

# CAWWT TIMELINE



### 3.6.1 NPDES Monitoring

There are six permitted FEMP wastewater discharge outfalls to State of Ohio waters that are regulated by the NPDES Permit Program (see Figure 3-11). There are also two internal monitoring points. The permit (Ohio EPA Permit No. 11O00004\*ED) is administered by the Ohio EPA and granted to the DOE at the FEMP. The effluent pollutant limitations, monitoring requirements, and reporting requirements are specified in the permit for each outfall and internal monitoring point.

Discharges through Outfall 4001 enter the Great Miami River at River Mile 24.73. The sampling and monitoring location for this outfall is the Parshall flume chamber immediately downstream from Manhole 176B. This outfall is the primary FEMP wastewater discharge outfall consisting of discharges from the AWWT facilities, IAWWT, SPIT, STP, untreated groundwater, and untreated storm water.

Discharge through Outfall 4002 enters Paddys Run at River Mile 2.50. The sampling and monitoring location for this outfall is the SWRB overflow spillway (location 4002O on Figure 3-11). Discharge at this outfall only occurs when the accumulation of storm water in the SWRB exceeds the capacity of the SWRB.

Discharges through Outfalls 4003, 4004, 4005, and 4006 are untreated storm water runoff drainage from site areas into Paddys Run. Runoff from eastern and southern areas of the site drains through Outfall 4003, which is just north of Willey Road. Runoff from the area north and west of the inactive flyash pile drains through Outfall 4004, which is just west of the flyash pile. Runoff from the western area of the site drains through Outfall 4005, which is just south of the K-65 Silos. Runoff from areas north of the site drains through Outfall 4006, which is north of Waste Pit 5.

Internal sampling station 4589 is the sampling of dewatered sludge from the STP. Internal sampling station 4601 is the sampling of final effluent from the STP at the Ultraviolet Disinfection Building.

### \* 3.6.2 Radionuclide and Uranium Monitoring

The FEMP site conducts a surface water sampling and analytical program for certain specific radionuclides which are potentially present in the regulated liquid effluent and in the uncontrolled storm water runoff from the site. Details of this program are provided in Section 4 of the IEMP. The

program consists of uranium analysis of a daily flow-proportional composite sample of the site effluent and grab sampling at monthly and quarterly intervals. The monthly samples are analyzed for total uranium, radium-228 and technetium-99, while the quarterly samples are analyzed for lead-210, radium-226 and strontium-90.

The daily total uranium analysis of the site effluent to the Great Miami River is used to track compliance with Operable Unit 5 ROD established limits. Since the issuance of the Operable Unit 5 ROD in January 1996, the FEMP is obligated to limit the total mass of uranium discharged through the FEMP outfall to the Great Miami River to 600 pounds per year.

This daily effluent uranium analysis is also used to forecast the FEMP's ability to achieve a future requirement for a monthly average uranium concentration of 20 ppb uranium in the site discharge to the river. This requirement became effective January 1, 1998, as established in the Operable Unit 5 ROD. The Operable Unit 5 ROD does allow relief from this 20 ppb requirement during periods of excessive precipitation and for scheduled maintenance. (Excessive precipitation is an amount of precipitation combined with the projected weather forecast, that causes water levels in the basin to threaten the limit of the holding capacity of the basin.) The uranium concentration in the effluent to the river on up to 10 storm water bypass days a year may be deleted when calculating the monthly average. Section 9.1.5 of the Operable Unit 5 ROD stipulates that notification will be provided to EPA and OEPA within seven days of the implementation of such a direct bypass. The purpose of the bypass is to minimize the possibility of SWRB overflow to Paddys Run.

The average monthly uranium concentration is calculated by multiplying each daily flow by the uranium concentration of the flow-weighted composite sample for that respective day. The sum of the values obtained by multiplying the flow times the concentration is then divided by the sum of the flows for the month. The result is a flow-weighted average monthly uranium concentration. The daily flow-weighted concentrations are then multiplied by 8.35 (lb/gal) to obtain the daily pounds of uranium discharged. The sum of the daily masses for the year is used to compare against the 600-pound-per-year limit.

After the average monthly uranium concentration has been calculated, the 10 allowable bypass concentrations will be accounted for as follows: If any by-pass days occur during a particular month

which equal or exceed 12 hours in duration, the flow-weighted concentration for those days will be dropped, the days will be added to the yearly tally of bypass days, and the average will be recalculated. If additional bypass days of less than 12 hours occur during a month (partial bypass days), and the monthly average is still above 20 ppb, then the highest flow-weighted concentration will be dropped and the average will be recalculated. This method will be repeated until the 20 ppb limit is achieved or all of the allowable partial bypass days have been expended.

**EXAMPLE:** Storm water bypasses occurred on March 2, 3, and 4, 1997. The bypassing started at 12:00 a.m. on March 2 and ended at 9:30 a.m. on March 4. Therefore two full days of bypassing occurred equal to or greater than 12 hours of bypassing and one partial bypass day occurred. The flow-weighted average for the month was 33 ppb. By dropping the daily flow-weighted concentration of the two fully bypassing days, the average was reduced to 18 ppb. Thus, although the bypass occurred over three calendar days which were reported to the agencies, only two of the 10 allowable bypass days were expended to meet the 20 ppb limit.

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If the adjusted average monthly uranium concentration exceeds the 20 ppb limit after the flow-weighted concentrations for all allowable by-pass days have been removed, the excursion will be reported to the agencies.

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If a sequence of months (i.e., not a random occurrence) indicate an exceedance of the 20 ppb monthly average, and there has not been above average rainfall, then corrective measures will need to be evaluated. Depending on the reason for the sequence of exceedances, corrective actions could include: modifications to parts of the FEMP wastewater system as discussed in Section 3.5.4 or 5.4.1.2; segregation of the South Plume Optimization wells discharge from the combined SPO/South Plume Recovery System header to reduce the concentration of uranium in flow bypassing treatment, or other such actions.

The need for corrective measures will be discussed with the EPA and Ohio EPA in periodic meetings/reports. (Summary reporting of how the FEMP is doing with respect to compliance with the 20 ppb uranium discharge limit and the use of bypass days will be included in the meetings/reports.) In the event that corrective measures are deemed necessary, the situation will be outlined to the EPAs in order to reach consensus regarding what action (if any) is required.