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January 14, 1998

Fernald Environmental Management Project  
Letter No. C:C:SWP(ARWWP):99-0003

Mr. Thomas Winston, District Chief  
Southwest District Office  
Ohio Environmental Protection Agency  
401 East Fifth Street  
Dayton, OH 45402-2911

Dear Mr. Winston:

**NONCOMPLIANCE REPORT - DECEMBER 1998 - NPDES PERMIT NUMBER 11000004\*ED -  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

Enclosed is the Noncompliance Report for December, 1998. In addition, the December 1998 Discharge Monitoring Reports are enclosed to aid your review. If you have any questions, please contact Marlene M. Landrum at (513) 648-4197.

Sincerely,



David J. Brettschneider, Project Manager  
AWWT & Wastewater Project

MML  
Enclosures

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NONCOMPLIANCE REPORT  
 NPDES PERMIT NO. 11000004\*ED  
 FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
 U.S. DEPARTMENT OF ENERGY

The following table describes the December 1998 noncompliances with the discharge limitations specified in the FEMP NPDES Permit. This table lists the affected outfalls, dates of the noncompliances, parameters, permit limits, and measured effluent concentrations.

<b>PARSHALL FLUME - OUTFALL *4001</b>			
DATE	PARAMETER	PERMIT LIMIT	ACTUAL MEASUREMENT
December 22, 1998	TSS Mass Loading	473 kg/d	659.2 kg/d
December 23, 1998	TSS Mass Loading	473 kg/d	481.7 kg/d
<b>SEWAGE TREATMENT PLANT (STP) - OUTFALL *4601</b>			
December 14, 1998	TSS Concentration	40 mg/l	44.0 mg/l
December 16, 1998	TSS Concentration	40 mg/l	57.0 mg/l
December 28, 1998	TSS Concentration	40 mg/l	41.0 mg/l
December 1998	Monthly Avg. Concentration	20 mg/l	31.4 mg/l

The noncompliances at the Parshall Flume are the direct result of flow being discharged in amounts substantially larger than the current permit basis. The TSS loading in the current permit is based on 2.775 MGD. The flow rates on December 22 and 23 were 7.257 and 6.917 MGD respectively. The TSS concentrations were elevated on these days (24.0 and 18.4 mg/l respectively) due to the bypassing of storm water from the Storm Water Retention Basin directly to the river, necessitated by heavy rainfall. However, the concentrations are well within specified effluent limitations for TSS concentration. As you know, the FEMP is in the process of renewing the existing permit, having submitted a renewal application on September 18, 1997 and an addendum to the application on August 31, 1998. The flow basis will be adjusted accordingly once the new permit is issued.

The noncompliances at the sewage treatment plant are related to the continuing problems associated with suspended solids control. FDF technical and operations staff have had a series of meetings to identify and evaluate the corrective actions undertaken to date and determine the appropriate path forward. Past corrective actions have been unsuccessful. FDF now believes the likely root cause of the TSS violations are related to a low organic loading in the aeration basin and are now preceding under this premise.

The following actions have been undertaken to address these continuing TSS noncompliances:

1. FDF has been operating the system with one reactor basin (aeration basin) followed by two secondary clarifiers. This has allowed the use of the second reactor basin to be used as an equalization tank accepting large flows and then bleeding these flows back into the reactor basin. This has mitigated difficulties during periods of high flow rates but has not alleviated the TSS problems.
2. Aeration time was adjusted in the reactor basin given the possibility that perhaps a shearing of the floc was being experienced. However, this has not alleviated the TSS problem.
3. Operations staff have observed the biomass under a microscope and have determined that no microorganisms detrimental to the activated sludge process are present (e.g. nocardia). Filaments have been observed but not in excess that would lead to a bulking floc.
4. Operations staff have evaluated the floc using a settleometer and found the floc to be rapid settling, indicating a high sludge density.
5. Operations staff have begun introducing a biomass supplement (dog food) on weekends and holidays (i.e. periods of low influent flows) in an attempt to increase mixed liquor volatile suspended solids. This was begun December 28 and to date has raised MLVSS from approximately 200 mg/l to 600 mg/l. Additionally, sludge return and sludge wasting is being monitored and adjusted to increase the food/microorganisms ratio and reduce sludge age.
6. Operations staff have eliminated the return of scum collected from the secondary clarifier to the aeration basin. Scum can potentially be a source of certain species detrimental to the activated sludge process.
7. While infiltration and inflow (I/I) has not been quantified, I/I is being suspected as a contributing factor to the low organic loading in the reactor basin. The existing sanitary sewer system is quite old and the infiltration may be significant based on the known perched groundwater zones. While this may not have had an adverse impact on the old trickling filter plant, excessive infiltration may be detrimental to an activated sludge plant. Additionally, any discovered sources of inflow into the sanitary system will be eliminated.
8. FDF has begun to evaluate whether comminution of the sewage influent is contributing a poor settling waste stream.

FDF is continuing to monitor the performance of the sewage treatment plant. As you know, adjustments to the activated sludge process must be deliberate and allow for a reasonable time for the process to react and stabilize to the adjustments made. Only through a step by step process can these adjustments be evaluated as to which are beneficial and which are not. In order to focus our efforts, FDF has assigned a lead

supervisor at the sewage treatment plant, experienced in the operation and in the trouble shooting of activated sludge systems, to oversee these process modifications. Additionally, U.S. EPA publications (e.g. Operation of Wastewater Treatment Plants - Vol., 1 & 2) as well as other literature sources are being consulted throughout this process.