

7261

G-000-104.198

**NONCOMPLIANCE AND PH EXCURSION REPORT - OCTOBER 1995 -  
NPDES PERMIT NUMBER 1L000004\*DD - FERNALD ENVIRONMENTAL  
MANAGEMENT PROJECT**

11/14/95

**C:EC(RTS):95-0089  
FERMCO           OEPA  
4  
LETTER**



Restoration Management Corporation

P.O. Box 398704 Cincinnati, Ohio 45239-8704 (513) 738-6200

November 14, 1995

Fernald Environmental Management Project  
Letter No. C:EC(RTS):95-0089

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

Dear Mr. Winston:

**NONCOMPLIANCE AND PH EXCURSION REPORT - OCTOBER 1995 - NPDES PERMIT  
NUMBER 1100004\*DD - FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

Enclosed are the Noncompliance and pH Excursion Reports for October, 1995.

If you have any questions, please contact Frank Johnston at (513)648-5294.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen M. Beckman". The signature is fluid and cursive, with a long horizontal stroke at the end.

Stephen M. Beckman  
Manager  
Air & Water Programs

SMB:FLJ:wjw  
Enclosure

- c: K. A. Chaney, EM-423, OO  
D. E. Faris, FERMCO  
R. D. George, FERMCO  
T. D. Hagen, FERMCO  
F. L. Johnston, FERMCO  
D. Paine, FERMCO  
L. Pennington, FERMCO  
C. G. Siefert, FERMCO  
E. P. Skintik, DOE-FN  
AR Coordinator  
A&WP Files

000001

**PH EXCURSION REPORT  
 NPDES PERMIT NO. 11000004\*DD  
 FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
 U.S. DEPARTMENT OF ENERGY**

The following table describes the October 1995 pH excursions from the Discharge Limitations specified in the FEMP NPDES Permit. This table lists the outfall, date, number of pH excursions, permit limit, minimum/maximum measurement, duration of each excursion, and total combined time of all excursions.

**OUTFALL: 4001**

<u>Date</u>	<u>Number of Excursions</u>	<u>Permit Limit</u>	<u>Minimum/Maximum Measurement</u>	<u>Total Duration</u>
10/8/95	1	6.5	5.6	5 mins.
			<b>TOTAL TIME</b>	<b>5 MINS.</b>

**NONCOMPLIANCE REPORT  
NPDES PERMIT NO. 1100004\*DD  
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
U.S. DEPARTMENT OF ENERGY**

The following table describes the October 1995 noncompliances with the discharge limitations specified in the FEMP NPDES Permit. This table lists the outfall, date of noncompliance, parameter, permit limit, and measured effluent concentration.

**OUTFALL (NAME AND NUMBER): BIODENITRIFICATION EFFLUENT - 4605**

<u>Incident No.</u>	<u>Date</u>	<u>Parameter</u>	<u>Permit Limit</u>	<u>Actual Measurement</u>
95-33	October 10, 1995	BOD	45 mg/l (Daily Maximum)	147 mg/l
95-34	October 10, 1995	BOD	38 kg/d (Daily Maximum)	71.2 kg/d
95-35	October	BOD	30 mg/l (Monthly Average)	82.2 mg/l
95-36	October	BOD	26 kg/d (Monthly Average)	40.0 kg/d
95-37	October	Nitrate-Nitrogen	72.7 mg/l (Monthly Average)	81.1 mg/l

Incidents 95-33 through 95-37 all relate to operating the biodenitrification system for treating high nitrate water resulting from the UNH filtration project. In short, all the noncompliances relate to the biodenitrification towers not yet attaining their expected level of nitrate removal.

The BDN facility consists of the BDN Surge Lagoon (BSL), a High Nitrate Storage Tank (HNT), four BDN Towers, followed by the BDN Effluent Treatment System (NPDES outfall \*4605). The BSL and HNT serve to equalize the hydraulic and nitrate loading to the BDN towers.

Each of the four BDN Towers is a fluidized bed of anthracite coal on which bacteria is attached. This bacteria is utilized to remove nitrates from wastewater by converting nitrate to gaseous nitrogen. The effluent from these towers contain a high concentration of BOD due primarily to excess methanol feed. Methanol is used as the carbon source in the biological conversion of nitrate to nitrogen. The BDN Effluent Treatment System (BDN-ETS) is a package activated sludge plant, and was installed specifically to treat this BOD laden effluent from the BDN towers.

To process the nitrate laden UNH filtrate through the BDN towers, it is necessary to blend this filtrate with the BSL discharge to achieve a consistent loading to the towers. The measured concentration of the UNH filtrate is approximately 11,200 mg/l. The UNH filtrate was pumped at a constant rate of 5 gpm and blended with 130 gpm from the BSL. The BDN tower influent nitrate concentration ranged from 136 mg/l to 275 mg/l.

The operating conditions for the first 13 days of October remained fairly consistent: the HNT was discharged at 5 gpm; the BSL pumped at a rate of 130 gpm; the BDN tower effluent of 135 gpm was split such that 90 gpm was discharged to the BDN-ETS while 45 gpm was returned to the BSL; target pH's (7.0 - 10.0) were consistently maintained; target temperatures (91°F) were maintained.

The biomass in the BDN towers is apparently not yet acclimated to the point where efficient removal of nitrates are achieved. This sub-standard removal led to the violation of the monthly average violation for nitrate (Incident 95-37).

In an attempt to achieve better nitrate removals, the methanol (MeOH) feed to the BDN towers was increased from 10 ml MeOH/min on 10/1 to 16 ml MeOH/min on 10/3 and eventually up to 20 ml MeOH/min by 10/5. This resulted in MeOH concentrations in the tower effluent to increase from 74 mg/l on 10/1 to 256 mg/l on 10/10. This increase in methanol apparently upset the activated sludge system resulting in the noncompliance for BOD on 10/10.

The renewed NPDES permit, effective November 1, 1995, does not contain a monitoring location for the BDN-ETS effluent. However, there are effluent limitations for CBOD and monitoring requirements for nitrate-nitrite nitrogen at the final outfall to the river. FERMCO will continue to monitor the operation of the entire BDN facility to provide adequate treatment of high nitrate wastewater and assure that effluent limitations are not adversely impacted.