

April 8, 2004

Mr. Glenn Haas, Director
Division of Watershed Management
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Ms. Linda Murphy, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency
Water Technical Unit "SEW"
P.O. Box 8127
Boston, MA 02114

Re: Massachusetts Water Resources Authority, NPDES Permit Number MA0103284
Notification Pursuant to Part I.8. Contingency Plan

Dear Mr. Haas and Ms. Murphy:

One effluent quality parameter that MWRA monitors for NPDES Permit Compliance and Contingency Plan purposes is fecal coliform—an indicator of pathogen control. MWRA's NPDES Permit and Contingency Plan specify that the daily geometric mean of the fecal coliform samples taken prior to the entrance of the Deer Island Treatment Plant outfall tunnel, monitored a minimum of three times per day, is not to exceed 14,000 colonies per 100 milliliters (col/100 mL).

On April 2, 2004, the geometric mean of the three samples collected was 15,223 col/100 mL, which is slightly higher than the permit limit. This result triggers a notification requirement under the Contingency Plan. This letter and its attachment constitute that notification.

Plant staff control the disinfection process by flow-pacing the feed of sodium hypochlorite into the wastewater flow as it enters the two disinfection basins after primary and secondary treatment. Since the fecal coliform test requires 24 hours to complete, plant operators use total chlorine residual (TCR) as a real-time indicator of disinfection effectiveness. TCR measurements at the end of the basins are used to adjust the amount of sodium hypochlorite added to the basins. TCR is measured three ways: (1) continuously by an automated analyzer, (2) hourly using manual methods by operations staff for process control, and (3) three times a day in the laboratory before and after dechlorination for permit compliance reporting.

Target TCR levels are based on an analysis of historical data to determine the minimum TCR required to disinfect effluent sufficiently to comply with permit limits. Even at maximum flows, there is a minimum of 15 minutes contact time, which is accomplished in the basins and a section of the outfall tunnel. Historical data show that when TCR is measured at the effluent end of the disinfection basin

and a TCR of greater than or equal to 0.3 mg/L is achieved, permit limits are met 100% of the time; when the minimum TCR is greater than 0.1 mg/L, permit limits are met 98% of the time.

On April 2, both automatic and manual operations TCR measurements met the targets, although one of the laboratory-measured TCR samples was slightly lower than the minimum target. Nevertheless, the daily permit limit for fecal coliform was not met. The reason for this is not clear. There may be some relationship between the unusual result and the very high flows handled by the treatment plant during the storm of April 1 and 2, but despite the high flows, contact time would have been 15 minutes, and TSS was at normal levels on the day of the violation.

The table below shows fecal coliform and TCR measurements, plant flow, and effluent total suspended solids on April 1-April 3. On April 2, two of three samples had elevated fecal coliform counts. Other samples collected that day, the day before and the day after were below the 14,000 col/100 mL limit.

Bacteria, TCR and TSS effluent monitoring data April 1-3, 2004

Day/Time Sample Collected	Fecal Coliform (col/100 mL)	Disinfection Basin TCR Laboratory Measurement (mg/L)	Disinfection Basin TCR Automated Analyzer ¹ (mg/L)	Effluent TCR after dechlorination (mg/L)	TSS (mg/L)	Plant Flow (MGD)	
4/1/2004 07:45	2,120	0.22	0.56	<0.03	45	834	
10:10	1,900	0.13	0.39	<0.03		829	
13:24	4,000	0.22	0.56	<0.03		1112	
Daily Geometric Mean	2,526						
4/2/2004 07:40	7,000	0.21	0.24	<0.03	27	1213	
10:55	21,000	0.14	0.32	<0.03		1120	
13:36	24,000	0.09	0.26	<0.03		1078	
Daily Geometric Mean	15,223						
4/3/2004 07:01	6,500	0.11	0.15	<0.03	22	871	
09:31	<5	1.79	N/A	<0.03		366	
12:03	110	0.27	0.51	<0.03		886	
Daily Geometric Mean	153						

¹ Hourly manual operations measurements, not shown, were similar to automated measurements

MWRA has increased the target TCR to 0.5 mg/L to ensure that the permit limits will be met. Since April 2, fecal coliform measurements have been within permit limits.

It is worth noting that the 14,000 col/100mL permit limit is based on achieving the water quality standard (200 col/100 mL) at the edge of the mixing zone during periods of minimum dilution when dilution is approximately 70-fold. At this time of year, actual dilution at the outfall location is relatively high because there is no stratification in the water column. Because of this, it is likely that any impacts on water quality outside the mixing zone were minor. MWRA was unable to sample the receiving water in the vicinity of the outfall in Massachusetts Bay for bacteria at that time because weather conditions made it unsafe to sample by boat.

Please let me know if any of MWRA's staff can give you additional assistance regarding this notification.

Sincerely,

Michael J. Hornbrook
Chief Operating Officer

Attachment:

Deer Island Treatment Plant Operations Data showing April 2 plant flows, sodium hypochlorite dosing rates, and total chlorine residual levels from the disinfection process.

Cc:

Environmental Protection Agency, Region I (EPA)

Matthew Liebman
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Eric Hall
Roger Janson

MA Division of Marine Fisheries

Jeff Kennedy

Food and Drug Administration

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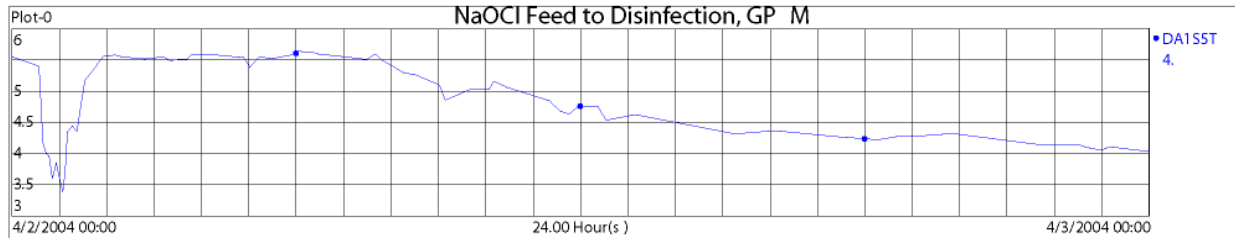
Cape Cod Commission

Steve Tucker

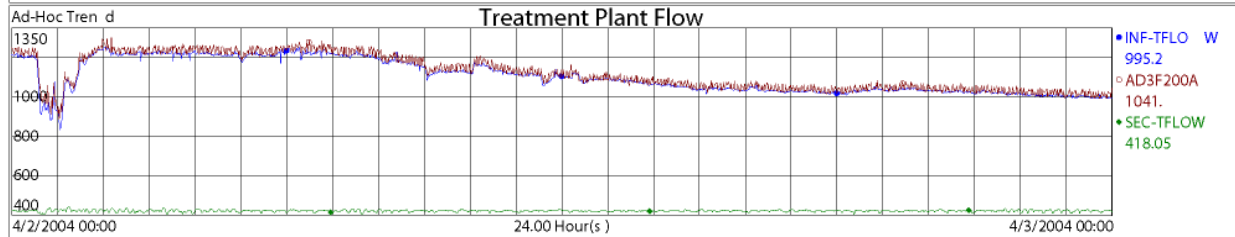
Attachment A

Deer Island Treatment Plant Operations Data

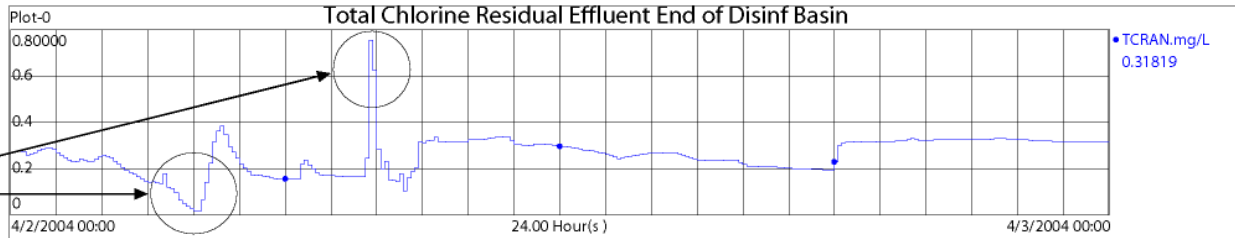
Graph 1: Depicts the sodium hypochlorite feed to disinfection expressed in gallons per minute.



Graph 2: Depicts Plant Flow from Pumping, Primary and Secondary Treatment, expressed in millions of gallons per day.



Graph 3: Depicts the Total Chlorine Residual from the automated TCR Analyzer located at the effluent end of the disinfection basin expressed in milligrams per liter.



Graph 4: Depicts the sodium hypochlorite contact time from the point of chemical addition to the point of dechlorination expressed in minutes.

