

Technical Memorandum 1

DATE: May 19, 2004

TO: Ron Mitchum (BCDCOG)
Environmental Technical Advisory Committee

FROM: Bill Martello (JYG)
Steve Davie (TT)

SUBJECT: Charleston Harbor System
Wastewater Characterization Data Needs

This technical memorandum provides a more detailed description of the data needs to better characterize the effluent discharges to the Cooper and Ashley Rivers along with Charleston Harbor. We are currently collecting the NPDES permits from the BCDCOG and working with SCDHEC (Wade Cantrell) to go through a spreadsheet list of current facilities and confirm the permit limits. The intention here is to address the data needs of the “significant” ultimate oxygen demand (UOD) discharges for the calibration of the 3-D hydrodynamic and water quality model. For this specific data request, “significant” UOD discharges are generally considered to be equal to or greater than 1 percent of the total permitted UOD on the Cooper and Ashley Rivers and harbor. Smaller discharges will be included in the model at their current permitted values unless DMR data can be made available and provided. Table 1 lists the “significant” UOD discharges where specific information outlined in this memo are critical to the success of the model calibration.

Table 1 – List of “Significant” UOD Discharges in the Charleston Harbor System

Permit Name	NPDES Number	Receiving Stream	Flow (mgd)	CBODU	NH3	UOD	Percent of Total
				(lbs/day)	(lbs/day)	(lbs/day)	
MeadWestvaco	SC0001759	Cooper	25.6	58,620	335.2013	60,152	31%
North Charleston Sewer District	SC0024783	Cooper	27	10,538	8,624	49,952	26%
Plum Island WWTP	SC0021229	Harbor	36	13,511	6,005	40,953	21%
Lower BCW&SA	SC0046060	Cooper	15	4,691	2,502	16,125	8%
Mt Pleasant Rifle Range	SC0040771	Harbor	6	1,877	1,001	6,450	3%
Bayer	SC0003441	Cooper	5.65	5,787	384	7,542	4%
Mt Pleasant Center Street	SC0040771	Harbor	3.7	1,157	617	3,978	2%
Summerville	SC0037541	Ashley	10	1,564	167	2,326	1%
BP (Amoco)	SC0028584	Cooper	4.5	2,970	0	2,970	2%
Monks Corner WWTF	SC0021598	West Cooper	1.6	600	267	1,820	1%
Lower Dorchester	SC0038822	Ashley	4	626	33	778	0%
DAK (Dupont)	SC0026506	Cooper	1.39	711	11	761	0%

A comprehensive list of permits is listed in Table 2 at the end of this memo. For the “significant” UOD discharges listed in Table 1, we are requesting specific information outlined below. Some of this data should be available from the DMR data.

Long Term BOD Data

Long term BOD measurements are critical to the success of the model calibration, and hence, the ability of the model to forecast or predict dissolved oxygen in the estuary. We are collecting long term BOD measurements in the river and estuary and are requesting the “significant” UOD discharges to collect the composite sample volumes to be analyzed by the same laboratory.

Sampling Protocol

- There will be two sampling efforts where each of these facilities is requested to collect the appropriate sample volume. The first event will be in May 2004 and then the second one will be in August 2004. For the May event, a sample for the long term BOD needs to be collected during the period May 17 through May 28.
- Each discharger will collect a 24-hour composite sample. We recommend at least 4 samples over the 24-hour period to characterize the effluent. Composite samples are to be taken at a location representative of the effluent being discharged.
- JJG will provide each discharger with a sample bottle and shipping container.
- The long term BOD sample will be placed in the shipping container and iced.
- The discharger will contact JJG to retrieve the sample for shipping to the laboratory.

Laboratory Analysis

- A laboratory contract has been prepared for all of the long term BOD sampling in conjunction with the Charleston Harbor System 3-D Modeling Project. The dischargers labs will not be required to analyze this sample.

Conventional Pollutants

The water quality model needs to have the following constituents to represent the discharge from each wastewater treatment facility:

Constituents

1. Flow
2. Temperature
3. Biological Oxygen Demand, 5-day (BOD5) (EPA 405.1)
4. Dissolved Oxygen (DO)
5. Total Kjeldahl Nitrogen (TKN) (EPA 351.2)
6. Nitrate-Nitrite (NO₃-NO₂) (EPA 353.1)
7. Ammonia (NH₃) (EPA 350.1)
8. Total Phosphorus (TP) (EPA 365.4)
9. Orthophosphate (PO₄) (EPA 365.2)
10. Total Organic Carbon (TOC) (EPA 415.1)

Sampling Protocol

- We would prefer to have all of these values at daily intervals.
- However, we understand that not all facilities collect these parameters on a daily or even monthly basis. Therefore, we would ask each “significant” UOD discharge in Table 1 to characterize the effluent with the collection of additional samples during the critical low flow periods of June, July, August, and September of 2004 to coincide with the river sampling effort.
- For the nitrogen and phosphorus series, a grab sample collected once per month would be better than our modeling estimate.

Laboratory Analysis

- Each individual discharger will be responsible for laboratory analysis of the requested conventional pollutants.
- If data is available from DMR reports to DHEC, that will be satisfactory.
- If your permit requires samples for CBOD5 rather than BOD5, the CBOD5 data will be acceptable and additional sampling for BOD5 is not required.

Problems/Questions

If there are any questions or problems with the wastewater characterization data needs, please contact one of the following project team:

- Bill Martello, JJG (Athens), 706.353.2868
- Rick Karkowski, JJG (Charleston), 843.747.5889
- Steve Davie, TT (Atlanta), 770.850.0949 ext 102

Table 2 – List of Permitted Discharges in the Charleston Harbor Estuary

No	Permit Name	NPDES Number	Receiving Stream	Flow (mgd)
1	MeadWestvaco	SC0001759	Cooper	25.6
2	North Charleston Sewer District	SC0024783	Cooper	27
3	Plum Island WWTP	SC0021229	Cooper	36
4	Lower BCW&SA	SC0046060	Cooper	15
5	Mt Pleasant Rifle Range	SC0040771	Cooper	6
6	Bayer	SC0003441	Cooper	5.65
7	Mt Pleasant Center Street	SC0040771	Cooper	3.7
8	Summerville	SC0037541	Ashley	10
9	BP (Amoco)	SC0028584	Cooper	4.23
10	Monks Corner WWTF	SC0021598	West Cooper	1.6
11	Lower Dorchester	SC0038822	Ashley	4
12	DAK (Dupont)	SC0026506	Cooper	1.322
13	Central BCW&SA	SC0039764	West Cooper	0.35
14	King's Grant	SC0021911	Ashley	0.238
15	CPW Daniel Island	SC0047074	Cooper	2
16	SC Ports	SC0021385	Cooper	0.056
17	Middleton Inn	SC0039063	Ashley	0.014
18	RM Engineered	SC0027502	Cooper	0.015
19	CR Bard	SC0035190	Cooper	0.382
20	Williams Station Steam Plant	SC0003883	Cooper	500
21	Nucor Steel	SC0047392	Cooper	2.3
22	Teal	SC003030	Ashley	0.03
23	CPW Pierpoint WWTP	SC0026069		1.5

Charleston Harbor System Wastewater Characterization Data Needs Summary

Parameter	Sample Type	Frequency	Duration	Lab Protocol
Flow	Average	Daily	Jan-Dec	n/a
BOD5	Daily Composite	Daily	Jan-Dec	EPA 405.1
Ammonia	Daily Composite	Daily	Jan-Dec	EPA 350.1
DO	Average	Daily	Jan-Dec	n/a
Temperature	Average	Daily	Jan-Dec	n/a
Nitrate-Nitrite	Daily Composite	1/month	June-Sept	EPA 353.1
Ortho-P	Daily Composite	1/month	June-Sept	EPA 365.2
TOC	Daily Composite	1/month	June-Sept	EPA 415.1
TKN	Daily Composite	1/month	June-Sept	EPA 351.2
Total P	Daily Composite	1/month	June-Sept	EPA 365.4
LTBOD	Daily Composite	2	May & August	n/a