

Bioassays of the City of

Flagler Beach Wastewater Treatment Plant

Flagler Beach, Flagler County, Florida

NPDES #FL0026611

Sampled 12/17/01

June 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Biology Section
Bureau of Laboratories
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Introduction

City of Flagler Beach Wastewater Treatment Plant, 2000 Avenue A, Flagler Beach, Flagler County, Florida, NPDES #FL0026611, tests performed on 18 to 20 December, 2001.

This wastewater treatment plant has a design flow of 1.0 MGD and an annual average daily flow of 0.71 MGD. The wastewater treatment system consists of a manually cleaned bar screen, an oxidation ditch, a clarifier with alum feed, and a chlorine contact chamber. The effluent is dechlorinated using sulfur dioxide before being discharged into the Class III marine waters of the Matanzas River (facility summary provided by Brian Kelsay, FDEP, Jacksonville).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1993, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027F.

Results and Discussion

The FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample of effluent collected from this facility using the mysid shrimp, *Americamysis bahia*, and the inland silverside, *Menidia beryllina.* The apparent salinity (based on conductivity and temperature) of the sample was approximately 2.6 parts per thousand (ppt). An aliquot of the sample was adjusted with artificial sea salts to an apparent salinity of 3.6 ppt for the *M. beryllina* test and 8.6 ppt for *A. bahia* test to ensure that the minimum salinity requirements for the test species (one ppt for *M. beryllina*, six ppt for *A. bahia*) were met. The control water was natural seawater (NSW) diluted to 3.6 ppt and 8.6 ppt for the *M. beryllina* and *A. bahia* tests, respectively. A salt control, natural seawater diluted to the original salinity (~2.6 ppt) of the sample and adjusted to the salinity of the appropriate test with artificial sea salts was also tested. The test results did not indicate toxicity to either test species within 48 hours (Tables 1).

Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. Further chemical analyses were performed on the sample, and several metals were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on December 17, 2001, did not show acute toxicity to either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Flagler Beach Wastewater Treatment Plant, 2000 Avenue A, Flagler Beach, Flagler County, Florida, NPDES# FL0026611, performed from 18 to 20 December, 2001.

Saltwater Tests

Facility:	**City of Flagler Beach WWTP**		**NPDES #**	**FL0026611**	Facility Type:	**Wastewater Treatment Plant**	**Analysts:** Della Parker-Hanson, Joshua Ayres, Gary Hardie
Location:	2000 Avenue A, Flagler Beach		Contact/District:	Jessica Weatherby/Northeast			
County:	Flagler		Test type:	static acute screen			
Sample Collection Date:	12/17/01	Time: 0745	# tests:	2	Receiving Water:	Intercoastal Waterway	
Test Beginning Date:	12/18/01	Time: 1730	Chlorination Type:	Chlorinated			
Test Ending Date:	12/20/01	Time: 1700		sample collected after dechlorination		**Page 1 of 1**	**Reviewer:** David Whiting

Organism: ***Americamysis bahia*** Life stage: 4 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected mmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	8.1	8.1	8.2	24.7	25.0	24.5	7.7	7.0	6.6	13.6	14.5
Control B	0/500	5	5	5	8.1	8.1	8.2	24.6	24.8	24.5	7.7	7.0	6.7	14.1	14.9
Control C	0/500	5	5	5	8.1	8.1	8.2	24.4	24.1	24.4	7.4	7.2	6.6	14.0	15.0
Cotnrol D	0/500	5	4	4	8.1	8.1	8.3	24.7	25.0	24.7	7.6	7.2	6.7	14.1	14.8
Salt Ctrl A	0/500	5	5	5	8.2	8.3	8.3	24.6	24.8	24.7	7.6	7.0	6.4	14.4	14.3
Salt Ctrl B	0/500	5	5	5	8.2	8.3	8.3	24.6	24.7	24.8	7.5	7.0	6.5	13.6	14.4
Salt Ctrl C	0/500	5	5	5	8.2	8.3	8.3	24.7	24.8	24.6	7.6	7.1	6.5	13.6	14.3
Salt Ctrl D	0/500	5	5	5	8.3	8.3	8.3	24.5	24.5	24.4	7.6	6.9	6.4	13.5	14.4
100% A	500/0	5	5	5	7.9	7.9	8.0	24.6	24.4	24.5	7.6	7.0	6.2	13.6	14.7
100% B	500/0	5	5	5	7.9	7.9	8.0	24.5	24.2	24.5	7.6	6.9	6.2	13.9	14.6
100 % C	500/0	5	5	5	7.9	7.9	8.1	24.5	24.2	24.9	7.5	6.9	6.5	13.8	14.9
100% D	500/0	5	5	5	7.9	7.9	8.1	24.5	24.2	24.7	7.5	6.8	6.4	13.8	14.7

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-26.0°C.
Incubator #3 temperature range for the test period was 24.0-25.5°C.

Organism: ***Menidia beryllina*** Life stage: 15 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[C]			Dissolved Oxygen			Conductivity Uncorrected mmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	4[B]	5	8.1	8.2	8.4	25.3	24.7	24.9	8.0	7.0	7.0	5.11	6.10
Control B	0/500	5	5	5	8.2	8.2	8.4	24.9	24.6	24.4	7.9	6.8	7.1	5.71	6.26
Control C	0/500	5	5	5	8.2	8.2	8.5	24.9	24.6	24.6	7.8	6.8	7.3	5.91	6.34
Cotnrol D	0/500	5	5	4	8.2	8.2	8.5	24.7	25.0	24.4	7.5	6.9	7.3	5.91	6.41
Salt Ctrl A	0/500	5	5	5	8.2	8.2	8.5	24.9	24.6	24.4	7.8	6.7	7.3	5.72	6.05
Salt Ctrl B	0/500	5	5	5	8.2	8.2	8.5	24.6	24.5	24.4	7.6	6.7	7.3	5.73	6.11
Salt Ctrl C	0/500	5	5	5	8.2	8.2	8.5	24.4	24.6	24.8	7.6	6.8	7.2	5.70	6.17
Salt Ctrl D	0/500	5	5	5	8.2	8.2	8.5	24.3	24.9	24.5	7.6	6.8	7.2	5.65	5.89
100% A	500/0	5	5	5	7.7	7.8	8.1	24.9	24.6	24.3	7.6	6.4	7.3	6.05	6.41
100% B	500/0	5	5	5	7.7	7.9	8.1	24.7	25.5	24.6	7.6	6.5	7.1	6.14	6.56
100 % C	500/0	5	5	4	7.7	7.9	8.1	24.6	25.4	24.6	7.6	6.2	7.1	6.13	6.50
100% D	500/0	5	5	5	7.6	7.9	8.1	24.6	25.2	24.6	7.3	6.2	7.1	6.11	6.53

[B] Not observed at 24 hrs, but observed at 48 hrs.
[C] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-26.0°C.
Incubator #3 temperature range for the test period was 24.0-25.5°C.

LIMS	
Job number:	TLH-2001-12-18-28
sample number:	567394

Data Transcription Verification	
date:	2/18/02
by:	Della Parker-Hanson
	Karla Whiddon

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
NSW	<0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
NSW	129	-
100% Sample:	96	-

Salinity[D]	ppt
Mysid control:	~8.6
Menidia control:	~3.6
Mysid 100% sample:	~8.6
Menidia 100% sample:	~3.6
unadjusted 100% Sampl	~2.6

[D] Salinity based on conductivity and temperature.

Table 2. Results of chemical analyses on the effluent from City of Flagler Beach Wastewater Treatment Plant sampled on December 17, 2001.

Metals

Aluminum	320	µg/L	
Calcium	95.8	mg/L	
Copper	0.85	µg/L	[I]
Magnesium	93.5	mg/L	

Pesticides and Herbicides

None detected

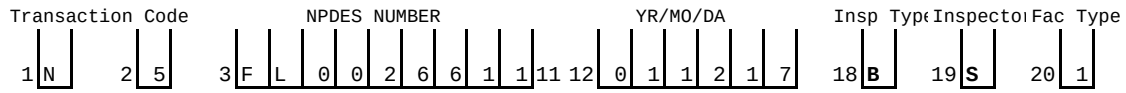
Base, Neutral, & Acid Extractable Organics

None detected

[I] The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

The Bioassay of City of Flagler Beach Wastewater Treatment Plant effluent sampled on December 17, 2001, NPDES #FL0026611.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, X

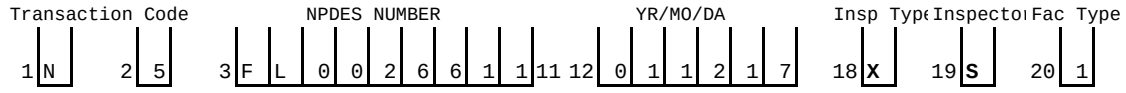


Remarks

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The Priority Pollutants Analysis for Bioassay of City of Flagler Beach Wastewater Treatment Plant effluent sampled on December 17, 2001, NPDES #FL0026611.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, X



Remarks

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