

Bioassays of

Fleming Oaks Wastewater Treatment Plant

Green Cove Springs, Clay County, Florida

NPDES #FL0032875

Sampled 10/8/01

January 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Introduction

Fleming Oaks Wastewater Treatment Plant, 6572 Bahia Road, Green Cove Springs, Clay County, Florida, NPDES #FL0032875, tests performed on 9 to 11 October 2001.

This domestic wastewater treatment facility has a design flow of 0.490 MGD and an average flow of 0.317 MGD. The wastewater treatment process consists of influent screening, aeration, clarification, chlorination using chlorine gas, and dechlorination using sulfur dioxide gas. After treatment the effluent is discharged into the Class III fresh waters of the St. Johns River (facility summary provided by Brian Kelsay and Jessica Weatherby, 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. The test species used for these bioassays were the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyrprinella leedsi*. The test results did not indicate toxicity to either test species within 48 hours (Table 1).

Total residual chlorine was not detected in the sample in the field or in the laboratory. Total and unionized ammonia concentrations in the bioassay sample were 5.54 mg/L and 0.036 mg/L, respectively. The unionized ammonia concentration of the sample calculated from the analytical chemistry analysis for ammonia and the physical parameters taken in the field was 0.003 mg/L, which is within the State of Florida water quality criteria limit for unionized ammonia in fresh waters ($\leq$0.02 mg/L). Further chemical analyses were performed on the sample, and several metals and an herbicide were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on October 8, 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 Fleming Oaks Wastewater Treatment Plant, 6572 Bahia Road, Green Cove Springs, Clay County, Florida, NPDES# FL0032875 performed from 9 to 11 October 2001.

Facility:	**Fleming Oaks WWTP**		**NPDES #**	**FL0032875**	Facility Type:	**Wastewater**	**Analysts:**	Della Parker-Hanson
Location:	6572 Bahia Road		Contact/District:	J. Weatherby/Northeast		**Treatment Plant**		Joshua Ayres
County:	Clay		Test type:	static acute screen				Marshall Faircloth
Sample Collection Date:	10/8/01	Time: 1405	# tests:	2	Receiving Water:	St. Johns River		
Test Beginning Date:	10/9/01	Time: 1150	Chlorination Type:	chlorinated				
Test Ending Date:	10/11/01	Time: 1350		sample collected after dechlorination		**Page 1 of 1**	**Reviewer:**	David Whiting

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected µmhos/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	0/20	5	5	5	8.3	-	8.3	24.4	-	24.2	8.2	-	7.8	170	225
Control B	0/20	5	5	5	-	-	8.3	-	-	24.1	-	-	7.8	-	230
Control C	0/20	5	5	5	-	-	8.4	-	-	24.1	-	-	7.8	-	200
Control D	0/20	5	5	5	-	-	8.4	-	-	24.1	-	-	7.9	-	210
100% A	20/0	5	5	5	7.0	-	8.5	24.6	-	24.6	8.2	-	7.9	510	515
100% B	20/0	5	5	4	-	-	8.5	-	-	24.6	-	-	7.8	-	515
100% C	20/0	5	5	5	-	-	8.5	-	-	24.6	-	-	7.9	-	525
100% D	20/0	5	5	5	-	-	8.5	-	-	24.6	-	-	7.9	-	560

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.5-25.0 °C.
Incubator #2 temperature range for the test period was 25.0-26.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 5 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity Uncorrected µmhos/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	7.8	8.5	8.6	24.7	25.0	25.4	7.3	7.8	7.8	270	300
Control B	0/500	5	4	4	7.8	8.5	8.6	24.6	24.9	24.7	7.3	7.7	7.7	270	290
Control C	0/500	5	5	5	7.8	8.5	8.6	24.6	24.5	24.6	7.2	7.8	7.7	270	300
Cotnrol D	0/500	5	5	5	7.8	8.5	8.6	24.5	24.6	24.5	7.2	7.8	7.8	270	295
100% A	500/0	5	5	5	7.0	8.1	8.3	24.5	24.6	24.9	7.4	7.6	7.1	510	530
100% B	500/0	5	5	5	7.0	8.1	8.3	24.5	24.5	24.9	7.3	7.6	7.3	500	570
100 % C	500/0	5	5	5	7.0	8.2	8.3	24.4	24.9	24.8	7.5	7.4	7.1	470	560
100% D	500/0	5	5	5	7.0	8.1	8.2	24.3	24.9	24.6	7.4	7.3	7.3	510	560

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.5-25.0°C.
Incubator #3 temperature range for the test period was 24.5-25.0°C.

Data Transcription Verification	
date:	1/9/02
by:	Della Parker-Hanson Cathy Oaks

Total Residual CL2	mg/L	Method
Field:	<0.01	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (fish):	<0.017	<0.017
Control water (water flea):	<0.017	<0.017
100% Sample:	5.54	0.036

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	155	153
Control water (water flea):	78	82
100% Sample:	111	108

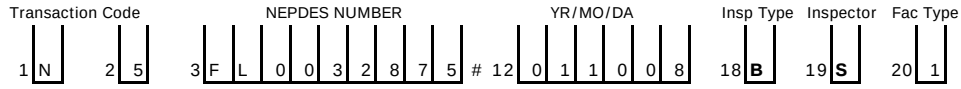
Table 2. Results of chemical analyses on the effluent from Fleming Oaks Wastewater Treatment plant sampled on October 8, 2001.

Metals			
Cadmium	0.048	µg/L	[I]
Calcium	21.5	mg/L	
Copper	2.1	µg/L	[I]
Iron	450	µg/L	
Magnesium	9.9	mg/L	
Nickel	8.3	µg/L	
Zinc	25	µg/L	
Pesticides and Herbicides			
Atrazine	0.29	µg/L	
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 Fleming Oaks Wastewater Treatment Plant effluent sampled on October 8, 2001, NPDES #FL0032875.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

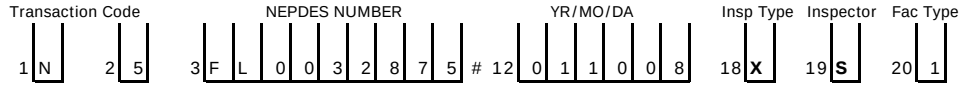


Remarks

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The Priority Pollutants Analysis for Bioassay of Fleming Oaks Wastewater Treatment Plant effluent sampled on October 8, 2001, NPDES #FL0032875.

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Remarks

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