

Bioassays of

Green Cove Springs

Green Cove Springs, Clay County, Florida

NPDES #FL0020915

Sampled 10/15/01

February 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Bureau of Laboratories
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Introduction

Green Cove Springs-Harbor Road, 12277 Harbor Road, Green Cove Springs, Clay County, Florida, NPDES #FL0020915, tests performed on 16 to 18 October 2001.

This wastewater treatment facility has a design flow of 0.75 MGD and an average flow of 0.476 MGD. The treatment system consists of a static bar screen, one contact tank, a stabilization basin, one secondary clarifier, and a chlorine contact chamber. Residuals are aerobically digested. The effluent is dechlorinated using sulfur dioxide gas before being discharged into the Class III fresh waters of the St. Johns River.

This facility has intermittently exceeded the limits for unionized ammonia from January of 1998 through July of 2001. A consent order was issued October 11, 2001 that required weekly effluent monitoring, with a single maximum unionized ammonia limit of 0.29 mg/L. The consent order is still in effect (facility summary provided by Herndon Sims, 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 water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella 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 bioassay sample in the laboratory. Total and unionized ammonia concentrations in the bioassay sample were 10.3 mg/L and 0.164 mg/L, respectively. The unionized ammonia concentration of the effluent at the time of sampling, calculated using a preserved analytical chemistry sample and the physical parameters taken in the field, was 0.02 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 15, 2001, did not show acute toxicity to the either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Green Cove Springs-Harbor Road, 12277 Harbor Road, Green Cove Springs, Clay County, Florida, NPDES# FL0020915 performed on 16 to 18 October 2001.

Facility:	**Green Cove Springs**		**NPDES #**	**FL0020915**	Facility Type:	**Wastewater**	**Analysts:** Della Parker-Hanson
Location:	12277 Harbor Road		Contact/District:	O'Connor/Northeast		**Treatment Plant**	Marshall Faircloth
County:	Clay		Test type:	static acute screen			Joshua Ayres
Sample Collection Date:	10/15/01	Time: 1400	# tests:	2	Receiving Water:	St Johns River	Daisys Tamayo
Test Beginning Date:	10/16/01	Time: 1350	Chlorination Type:	Chlorinated			Eva Pastora
Test Ending Date:	10/18/01	Time: 1335		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	23.8	-	24.4	8.0	-	7.7	170	170
Control B	0/20	5	5	5	-	-	8.3	-	-	24.4	-	-	7.7	-	160
Control C	0/20	5	5	5	-	-	8.3	-	-	24.3	-	-	7.8	-	190
Control D	0/20	5	5	5	-	-	8.3	-	-	24.1	-	-	7.8		195
100% A	20/0	5	5	5	7.4	-	8.4	24.1	-	24.3	8.1	-	8.1	555	630
100% B	20/0	5	5	5	-	-	8.5	-	-	24.9	-	-	7.8	-	560
100% C	20/0	5	5	5	-	-	8.4	-	-	24.4	-	-	7.9	-	570
100% D	20/0	5	5	5	-	-	8.4	-	-	24.2	-	-	7.8	-	615

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.5-26.0°C.
Incubator #2 temperature range for the test period was 24.5-25.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 12 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	7.9	8.3	8.5	24.0	23.5	23.9	7.9	7.9	7.8	255	290
Control B	0/500	5	5	5	7.9	8.4	8.6	23.9	23.1	24.1	7.9	7.8	7.7	260	310
Control C	0/500	5	5	5	7.9	8.4	8.5	23.9	23.1	24.5	7.9	8.0	7.5	265	295
Control D	0/500	5	5	5	7.9	8.4	8.5	23.9	23.3	24.6	7.9	8.0	7.5	265	280
100% A	500/0	5	5	5	7.4	8.1	8.3	24.1	23.2	24.4	8.0	7.9	7.3	540	575
100% B	500/0	5	5	5	7.4	8.1	8.3	24.3	23.3	24.5	8.0	7.9	7.1	540	570
100% C	500/0	5	4	4	7.4	8.1	8.3	24.3	23.3	24.5	8.0	7.6	7.1	540	640
100% D	500/0	5	5	5	7.4	8.1	8.3	24.3	23.3	24.2	8.0	7.7	7.2	550	585

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.5-26.0°C.
Incubator #3 temperature range for the test period was 26.0-27.0°C.

Data Transcription Verification	
date:	1/17/02
by:	Cathy Oaks
	Della Parker-Hanson

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
20% Dilute Mineral Water (cladocerans):	< 0.017	<0.017
100% Sample:	10.30	0.164

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	152	136
20% Dilute Mineral Water (cladocerans):	78	76
100% Sample:	154	121

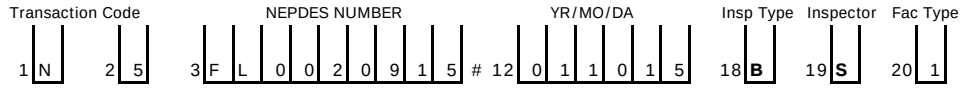
Table 2. Results of chemical analyses on the effluent from Green Cove Springs-Harbor Road sampled on October 15, 2001.

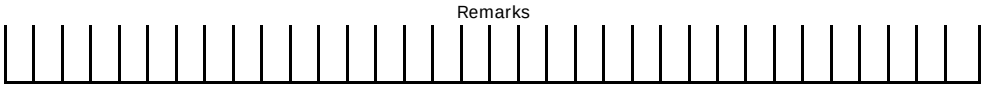
Metals			
Calcium	29.3	mg/L	
Copper	2.98	µg/L	
Iron	64	µg/L	I
Lead	0.63	µg/L	I
Magnesium	12.2	mg/L	
Silver	0.03	µg/L	I
Zinc	68	µg/L	
Pesticides and Herbicides			
Atrazine	0.13	µg/L	I
Base, Neutral, & Acid Extractable Organics			
None detected			

[I] Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit.

The Bioassay of Green Cove Springs Wastewater Treatment Plant effluent sampled on October 15, 2001, NPDES #FL0020915.

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

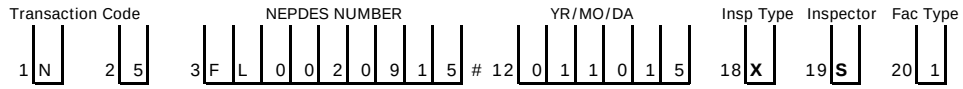


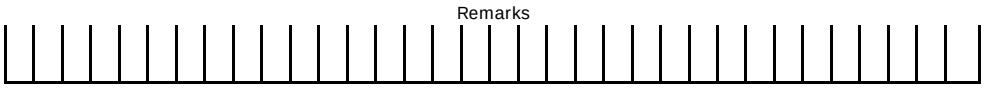


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The Priority Pollutants Analysis for Bioassay of Green Cove Springs Wastewater Treatment Plant effluent sampled on October 15, 2001, NPDES #FL0020915.

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