

Bioassays of

Crescent City Wastewater Treatment Plant

Crescent City, Putnam County, Florida

NPDES #FL0021610

Sampled 3/3/92

April, 1992

Biology Section
Division of Technical Services

Bioassays of

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Biology Section
Bureau of Laboratories
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Introduction

Crescent City WWTP, Crescent City, Putnam County, Florida, NPDES #FL0021610, on 4 to 6 March, 1992.

This facility is located at Cypress and Lake Streets. It has a design capacity of 0.250 MGD with an average flow of 0.073 MGD which is discharged to Crescent Lake. Wastewater treatment includes screening, conventional aeration, final settling, disinfection with chlorine gas, and dechlorination prior to discharge. Sludge is used for land reclamation.

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1991, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition (EPA/600/4-90/027).

Results and Discussion

The Biology Section performed two static acute screening bioassays on a sample of effluent from this facility. The bioassay test species used for these tests were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Notropis leedsi*. The test results indicated that the sample was not toxic to the test organisms.

Total residual chlorine was not detected in the sample. The total and unionized ammonia concentrations were 0.96 mg/L (Hach) and 0.01 mg/L, respectively. Further chemical analyses detected the metals: aluminum (371 µg/L[A]), cadmium (0.2 µg/L[T]), copper (48 µg/L[A]), iron (115 µg/L[A]), lead (4.8 µg/L[A]), mercury (0.12 µg/L[T]), silver (0.54 µg/L[J]), and zinc (83 µg/L[A]). Nutrient analyses detected nitrite/nitrate (11 mg/L[A]), total Kjeldahl nitrogen (2.6 mg/L), and total phosphorus (2.9 mg/L). Chlorinated pesticides and organic compounds were not detected.

Conclusion

The sample from this facility was not toxic on 3 March, 1992.

[A]Value reported is the mean of two or more determinations.
[J]Estimated concentration.
[T]Value reported is less than the practical quantitation limit.

Table 1. Concentration Series and Volumes Used for the Static Acute Screening Bioassays of the Crescent City WWTP on 4 to 6 March, 1992.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20 mL	0 mL	20 mL
100%	0 mL	20 mL	20 mL

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100%	0 mL	500 mL	500 mL

Table 2. Results of chemical analyses on the sample of effluent from the Crescent City WWTP, Putnam County, on 3 March, 1992.

Metals

Aluminum	371	µg/L	A
Cadmium	0.2	µg/L	T
Copper	48	µg/L	A
Iron	115	µg/L	A
Lead	4.8	µg/L	A
Mercury	0.12	µg/L	T
Silver	0.54	µg/L	J
Zinc	83	µg/L	A

Nutrients

Nitrite/Nitrate	11	mg/L	A
Total Kjeldahl Nitrogen	2.6	mg/L	
Total Phosphorus	2.9	mg/L	

J Estimated concentration.
A Value reported is the mean of two or more determinations.
T Value reported is less than the practical quantitation limit.

Table 3. Data recorded during the static acute screening bioassay of a sample of effluent from the Crescent City WWTP, Crescent City, Putnam County, Florida, NPDES# FL0021610, on 4 to 6 March, 1992.

Facility:	Crescent City STP	NPDES #	FL0021610	Facility Type:	Sewage Treatment
Location:	Cypress & Lake Streets, Crescent City	Contact/District:	J. Martin / Northeast		
County:	Putnam	Test type:	static screening		
Sample Collection Date:	3/3/92 Time: 0950	# tests:	2	Receiving Water:	Lake Crescent
Test Beginning Date:	3/4/92 Time: 1110	Chlorination Type:	chlorinated		
Test Ending Date:	3/6/92 Time: 1100	Dechlor Method:	plant dechlorination		Page 1 of 1

Total Residual Cl2	mg/l	Method
Field:	0.0	Hach
Lab:	0.0	Hach

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control Water (daphnids):	0.00	0.00
100% Sample:	0.96	0.01

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	138	130
Cond. Control Water (daphnids):	60	90
100% Sample:	110	160

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours
LC50: -

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 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	5	5	5	8.2	-	8.2	23.0	-	22.9	9.0	-	8.4	148	202
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.4	-	-
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.4	-	-
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.4	-	-
100%	5	5	5	7.2	-	8.2	22.0	-	25.3	8.5	-	8.3	530	616
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.3	-	-
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.3	-	-
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.3	-	-

Organism: ***Notropis leedsi*** Age: 23 days
LC50: -

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 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	5	5	5	7.7	8.1	8.2	21.8	23.0	23.2	8.7	8.3	8.1	-	-
Control	5	5	5	7.7	8.1	8.2	-	-	-	8.7	8.3	8.1	233	243
100%	5	5	5	7.1	7.7	7.9	22.0	23.0	23.2	8.5	7.1	7.0	-	-
100%	5	5	5	7.1	7.7	7.9	-	-	-	8.5	7.1	7.0	520	589

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Crescent City WWTP
Address/City: _____
County: Putnam
Contact/District: Jeff Martin / NE
NPDES Permit #: FL0021610 Outfall #: _____

Sample Collection: Date 9/3/92 Time 950
Test Beginning: Date 9/4/92 Time 1110
Test Ending: Date 9/6/92 Time 1100
Test Organism: C. dubia
Life Stage/Age: <24 hrs

92-MAR-04.02 29986

Test Number: 1 of 2 Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

Remarks: Very turbid sample - solids settling on bottom of containers

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7 10@10	8.6@23.5	23.2@23.5	1365@23.7 1372
24 hr	7@7 10@10	8.5@24°C	23.7@23.7	1373@23.9 1378
48 hr	7@7 10@10	8.5@24°C	23.2@23.4	1363@23.6 1384

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	A	5	5	5	8.2		8.2	23.0		22.9	9.0		8.4	148		202
Control	B	5	5	5			8.2						8.4			
Control	C	5	5	5			8.2						8.4			
Control	D	5	5	5			8.2						8.4			
100%	A	5	5	5	7.2		8.2	22.0		25.3	5.5		8.3	530		616
100%	B	5	5	5			8.2						8.3			
100%	C	5	5	5			8.2						8.3			
100%	D	5	5	5			8.2						8.3			
Measured/Loaded by:		MF	MF	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		MF	MF	MF	MF		MF	MF		MF	MF		MF	MF		MF

Investigators' Signatures

Sharon Jowle
Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.0	HACH	J.M
Lab Tot. Resid. Cl2:	0.0	0.0	0.0	HACH	MF
Alkalinity:	135	60	110	HACH	MF
Hardness:	130	90	160	HACH	MF
Total Ammonia:	0.0	0.0	0.96	HACH	MF

Ammonia Meter Slope: X

Ammonia Blank: 0.0

Salinity Sample: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Crescent City WWTP
Address/City:
County: Putnam
Contact/District: Jeff Martin / NE
NPDES Permit #: FL0021610 Outfall #:

Sample Collection: Date 3/3/92 Time 950
Test Beginning: Date 3/4/92 Time 1110
Test Ending: Date 3/6/92 Time 1100
Test Organism: M. beckai
Life Stage/Age: 23 days

92-MAR-04-02 29986

Test Number: 2 of 2 Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Remarks: Hardness Standard 105@100

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.0 10.0 10	8.6 @ 23C	23.2 @ 23.5	1368 @ 23.7 C
24 hr	7.0 10.0 10	8.5 @ 24°C	23.1 @ 23.7	1372 1378
48 hr	7.0 10.0 10	8.5 @ 24°C	23.2 @ 23.4	1363 @ 23.6 @ 1388

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	20	5	5	5	7.7	8.1	8.2	21.8	23.2	23.2	8.7	8.3	8.1			
Control	68	5	5	5	7.7	8.1	8.2				8.7	8.3	8.1	233	246	242
100%	76	5	5	5	7.1	7.7	7.9	22.0	23.0	23.2	8.5	7.1	7.0			
100%	39	5	5	5	7.1	7.7	7.9				8.5	7.1	7.0	570	545	589
															*	
Measured/Loaded by:		MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MK	MF
Recorded by:		MF	MF	MF	BJ	BJ	BJ	BJ	BJ	BJ	BJ	BJ	BJ	BJ	BJ	BJ

Investigators' Signatures

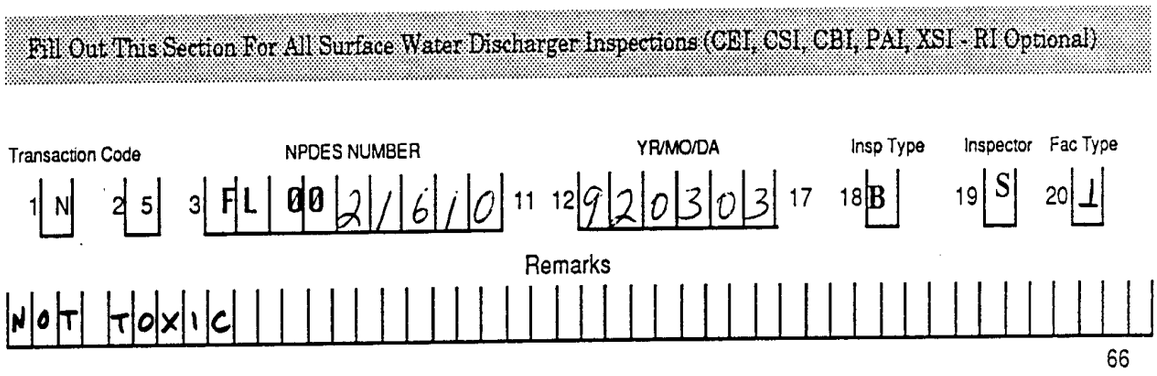
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.0		JM
Lab Tot. Resid. Cl2:	0.0	0.0	0.0	HACH	MF
Alkalinity:	135	60	110	HACH	BJ
Hardness:	130	90	160	HACH	BJ
Total Ammonia:	0.0	0.0	.96	HACH	BJ

Ammonia Meter Slope: _____ Ammonia Blank: 0.0 Salinity Sample: _____ ppt

The Bioassay of the Crescent City WWTP, NPDES# FL0021610, effluent sampled on March 3, 1992.



The Priority Pollutants Analysis for the Bioassay of the Crescent City WWTP, NPDES# FL0021610, effluent sampled on March 3, 1992.

