

Bioassays of the City of

Cocoa Wastewater Treatment Plant

Cocoa, Brevard County, Florida

NPDES #FL0021521

Sampled 12/5/94

February 1995

Biology Section
Division of Administrative and Technical Services
Comprehensive Quality Assurance Plan #870346G

Bioassays of the City of

Cocoa Wastewater Treatment Plant

Cocoa, Brevard County, Florida

NPDES #FL0021521

Biology Section
Bureau of Laboratories
February 1995

Introduction

City of Cocoa Wastewater Treatment Plant, Cocoa, Brevard County, Florida, NPDES #FL0021521, tests performed on 6 to 8 December, 1994.

This wastewater treatment plant is located at 325 North Cocoa Avenue in Cocoa and has a design flow of 4.5 MGD. Treatment of wastewater is by the activated sludge process with filtration, chlorination for disinfection, and dechlorination prior to discharge to the Indian River. The sample was collected before the waste stream entered the chlorine contact chamber (facility summary provided by Phil Kane, FDEP Orlando).

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 with a sample of effluent from this facility. The test species used for these bioassays were the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results did not indicate toxicity (Table 1).

Total residual chlorine of the sample was < 0.03 mg/L in the laboratory. Total ammonia was not detected in the sample. Further chemical analyses were performed on the sample and several metals were identified (Table 2). Pesticides and organics were not detected.

Conclusion

The sample of effluent collected from this facility on 5 December, 1994, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Cocoa WWTP, Cocoa, Brevard County, Florida, NPDES# FL0021521, performed on 6 to 8 December, 1994.

Facility:	**City of Cocoa WWTP**		**NPDES #**	**FL0021521**	Facility Type: **Wastewater Treatment Plant**
Location:	375 North Cocoa Avenue, Cocoa		Contact/District:	P. Kane/Central	
County:	Brevard		Test type:	static acute screen	Receiving Water: Indian River
Sample Collection Date:	**12/5/94**	Time: 0950	# tests:	2	
Test Beginning Date:	12/6/94	Time: 1430	Chlorination Type:	**Sample collected before chlorine contact chamber**	
Test Ending Date:	12/8/94	Time: 1430			**Page 1 of 1**

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

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature 0 hour	24 hour	48 hour	Dissolved Oxygen 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/20	5	5	5	8.2	-	8.2	22.8	-	25.0	8.2	-	7.4	160	175
Control B	0/20	5	5	5	-	-	8.2	-	-	25.2	-	-	7.5	-	180
Control C	0/20	5	5	5	-	-	8.2	-	-	25.2	-	-	7.5	-	180
Control D	0/20	5	5	5	-	-	8.2	-	-	25.1	-	-	7.5	-	185
100% A	20/0	5	5	5	7.3	-	8.2	22.8	-	25.1	7.9	-	7.5	680	740
100% B	20/0	5	5	5	-	-	8.2	-	-	25.2	-	-	7.6	-	780
100% C	20/0	5	5	5	-	-	8.2	-	-	25.3	-	-	7.6	-	770
100% D	20/0	5	5	5	-	-	8.2	-	-	25.3	-	-	7.5	-	760

Organism: ***Cyprinella leedsi*** Age: 11 days

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature 0 hour	24 hour	48 hour	Dissolved Oxygen 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/500	5	5	5	7.8	8.2	8.2	22.7	23.3	23.0	8.2	8.5	7.8	240	240
Control B	0/500	5	5	5	7.8	8.2	8.2	-	-	22.9	8.2	8.5	7.8	240	240
Control C	0/500	5	5	5	7.8	8.2	8.3	-	-	22.8	8.2	8.5	7.8	240	240
Control D	0/500	5	5	5	7.8	8.2	8.3	-	-	22.7	8.3	8.6	7.9	240	240
100% A	500/0	5	5	5	7.0	7.6	7.9	23.6	23.2	22.7	7.5	8.4	7.9	750	740
100% B	500/0	5	5	5	7.0	7.6	7.9	-	-	22.7	7.6	8.4	7.8	750	740
100% C	500/0	5	5	5	7.0	7.6	7.9	-	-	22.6	7.6	8.4	7.8	750	740
100% D	500/0	5	5	5	7.0	7.5	7.8	-	-	22.5	7.6	8.4	7.8	750	740

Total Residual CL2	mg/L	Method
Field:	2.66*	Plant meter
Lab:	<0.03	DR-100

*Total residual chlorine concentration in waste stream after chlorine contact chamber.

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	0.00
20% Dilute Mineral Water (cladocerans):	< 0.017	0.00
100% Sample:	<0.017	0.00

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	130	130
20% Dilute Mineral Water (cladocerans):	75	85
100% Sample:	75	145

Salinity	(ppt)
Control Water:	0
100% Sample:	0

Table 2. Results of chemical analyses on the effluent from the City of Cocoa Wastewater Treatment Plant sampled on December 5, 1994.

Metals

Aluminum	120	µg/L[I]
Calcium	40.1	mg/L[A]
Iron	36	µg/L[A]
Magnesium	7.06	mg/L[A]
Zinc	10	µg/ L[A]

Pesticides and Herbicides

none detected

Base-Neutral & Acid Extractables

none detected

[A] Value reported is the mean of two or more determinations.

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

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Cocoa WWTP
County: Brevard
Contact / District: Phil Kane / Central
NPDES Permit #: FL0021521
LIMS Sample #: 94790 **LIMS Job #:** 94-Dec-06-09
lims 12/21

Sample Collection: Date 12/5/94 Time 0950
Test Beginning: Date 12/6/94 Time 1430
Test Ending: Date 12/8/94 Time 1430
Organism Batch #: ____ **Diluent Batch #:** 47
Organism Age: < 24 hrs

Test Organism: Ceriodaphnia dubia

Test Type: Screening / Definitive
Static / Static Renewal / Flow-through

Test Number: 1 of 2

Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.5 @ 22.6	8.5 @ 23.2 °C	111 @ 102.6 970 @ 1,000 @ 23.7 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.9 @ 22.0	8.4 @ 23.9 °C	970 @ 1000 9620 @ 10000 @ 22.9 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.6 @ 22.7	8.5 @ 22.8 °C	960 @ 1000 9790 @ 10000 @ 23.5 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	UNCORRECTED 24 h	UNCORRECTED 48 h
Control	A	5	5	5	8.2		8.2	22.8		25.0	8.2		7.4	160		175
Control	B	5	5	5			8.2			25.2			7.5			180
Control	C	5	5	5			8.2			25.2			7.5			180
Control	D	5	5	5			8.2			25.1			7.5			185
100%	A	5	5	5	7.3		8.2	22.8		25.1	7.9		7.5	680		740
100%	B	5	5	5			8.2			25.2			7.6			780
100%	C	5	5	5			8.2			25.3			7.6			770
100%	D	5	5	5			8.2			25.3			7.5			760
Recorded by:		TM	TM	TR	JAS		JAS	JAS		JAS	JAS		JAS	JAS		JAS
Measured/Loaded by:		JAS	TM	MF	TM		TM	TM		TM	TM		TM	TM		TM

Investigators' Signatures

Tina M. Rudolf
Jennifer Sprague
John C. Keller
Joseph M. Faircloth
Reviewer

form updated 10/05/94

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			2.66	Hach meter	PK
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DR100	TM
Alkalinity (mg/L as $CaCO_3$):	130	75	75	HACH	JAS
Hardness (mg/L as $CaCO_3$):	130	85	145	HACH	JAS
Total ammonia (mg/L as N):	<0.017	<0.017	<0.017	Orion	TM

Ammonia Meter #98136 Ammonia Meter Slope: -57.9 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Cocoa - WWTP
County: Brevard
Contact / District: Phil Kane / Central
NPDES Permit #: FL0021521
LIMS Sample #: 94790 **LIMS Job #:** 94-Dec-06-09

Sample Collection: Date 12/5/94 Time 0950
Test Beginning: Date 12/6/94 Time 1430
Test Ending: Date 12/8/94 Time 1430
Organism Batch #: 49 **Diluent Batch #:** well
Organism Age: 11 days D
Test Organism: Cyprinella leedsi

Test Type: ~~Screening~~ / Definitive
Static / Static Renewal / Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.5 @ 22.6	8.5 @ 23.0 °C	111 @ 102.6 970 @ 1000 @ 23.7 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.9 @ 22.0	8.4 @ 23.1 °C	970 @ 1000 9620 @ 10000 @ 22.9 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.6 @ 22.7	8.5 @ 22.8 °C	960 @ 1000 9790 @ 10000 @ 23.5 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
Control A	219	5	5	5	7.8	8.2	8.2	22.7	23.3	23.0	8.2	8.5	7.8	240	245	240
Control B	136	5	5	5	7.8	8.2	8.2			22.9	8.2	8.5	7.8	240	245	240
Control C	75	5	5	5	7.8	8.2	8.3			22.8	8.2	8.5	7.8	240	245	240
Control D	366	5	5	5	7.8	8.2	8.3			22.7	8.3	8.6	7.9	240	245	240
100% A	102	5	5	5	7.0	7.6	7.9	23.6	23.2	22.7	7.5	8.4	7.9	750	745	740
100% B	196	5	5	5	7.0	7.6	7.9			22.7	7.6	8.4	7.8	750	745	740
100% C	62	5	5	5	7.0	7.6	7.9			22.6	7.6	8.4	7.8	750	745	740
100% D	22	5	5	5	7.0	7.5	7.8			22.5	7.6	8.4	7.8	750	745	740
Recorded by:		TM	TM	TR	JRS	TR	JRS	JRS	TR	JRS	JRS	TR	JRS	JRS	TR	JRS
Measured/Loaded by:		TR	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM

Investigators' Signatures

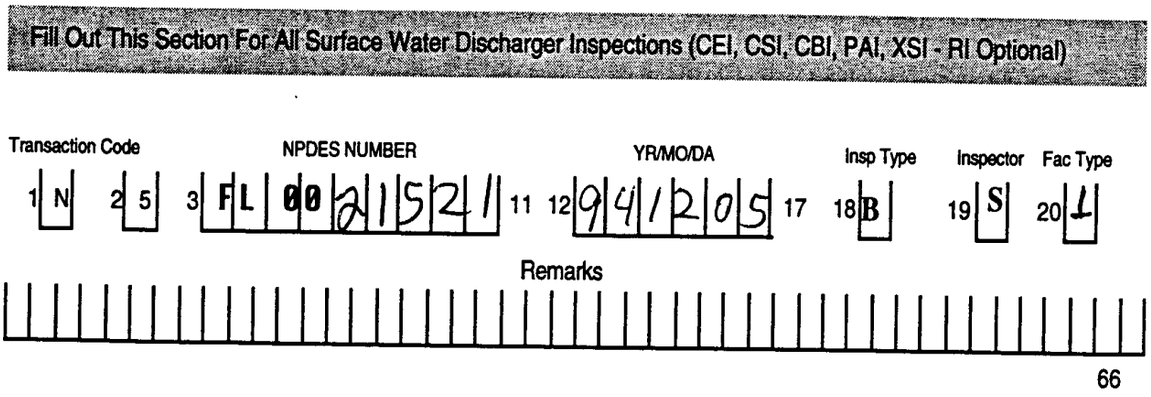
Tina Mikulski
Jennifer Sarafan
Brian Ce-Yoder
Joseph McFaiglish
Reviewer

form updated 10/05/94

Water Quality Parameters	Salt Water / Well Water / 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		2.66	plant meter	P. Kane
Lab Total Residual Cl2 (mg/L):	<0.03 / –	<0.03	DR100	TM
Alkalinity (mg/L as $CaCO_3$):	130 / –	75	HACH	JRS
Hardness (mg/L as $CaCO_3$):	130 / –	145	HACH	JRS
Total ammonia (mg/L as N):	<0.017	<0.017	Orion	TM

Ammonia Meter #98136 Ammonia Meter Slope: -52.9 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of the City of Cocoa WWTP effluent sampled on December 5, 1994, NPDES #FL0021521.



The Priority Pollutants Analysis for the Bioassay of the City of Cocoa WWTP effluent sampled on December 5, 1994, NPDES #FL0021521.

