

Bioassays of

Cocoa Beach Water Reclamation Facility

Cocoa Beach, Brevard County, Florida

NPDES #FL0021105

Sampled 8/20/01

December 2001

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

Bioassays of

Cocoa Beach Water Reclamation Facility

Cocoa Beach, Brevard County, Florida

NPDES #FL0021105

Biology Section
Bureau of Laboratories
December 2001

Introduction

Cocoa Beach Water Reclamation Facility, 1600 Minuteman Causeway, Cocoa Beach, Brevard County, Florida, NPDES #FL0021105, tests performed on 21 to 23 August 2001.

This water reclamation facility has a design flow of 6.0 MGD. Outfall D001 is permitted for limited wet weather discharge up to 91 days. Outfall D002 is permitted for limited intermittent discharges up to 30 days. The wastewater treatment facility consists of two contiguous, independently operated, two-stage nitrification/denitrification wastewater treatment plants. Each treatment plant has manual and mechanical influent screening, grit removal, anoxic/oxic biological treatment, clarification, chemical feed facilities, and tertiary filtration. The two plants share a common chlorine contact chamber and dechlorination. Residuals undergo aerobic digestion, advanced alkaline stabilization, and are then dewatered and dried using belt filter presses. Treated wastewater is intermittently discharged through Outfall D001 and Outfall D002 to the Class III marine waters of the Banana River. The Banana River is listed as an Outstanding Florida Water (OFW).

Discharge through Outfall D001 and D002 during the last two years has been less than the permitted 91 days. During the sampling event, Outfall D001 was discharging (facility summary provided by John Bowles and 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 on a sample of effluent collected from Outfall D001 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).

The total residual chlorine concentration in the effluent was measured at 0.06 mg/L in the field, possibly exceeding the State of Florida's water quality criteria for chlorine ($\leq$ 0.01 mg/L) at the time of sampling. However total residual chlorine was not detected in the sample in the laboratory. Total and unionized ammonia were not detected in the sample. 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 August 20, 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 Cocoa Beach Water Reclamation Facility, 1600 Minuteman Causeway, Cocoa Beach, Brevard County, Florida, NPDES# FL0021105 performed on 21 to 23 in August 2001.

Facility:	**Cocoa Beach WRF**		**NPDES #**	**FL0021105**	Facility Type:	**Water**	**Analysts:** Marshall Faircloth
Location:	1600 Minuteman Causeway		Contact/District:	Kane/ Central		**Reclaimation Facility**	Joshua Ayres
County:	Brevard		Test type:	static acute screen			Della Parker-Hanson
Sample Collection Date:	8/20/01	Time: 1000	# tests:	2	Receiving Water:	Banana River	
Test Beginning Date:	8/21/01	Time: 1330	Chlorination Type:	Chlorinated			**Reviewer:** David Whiting
Test Ending Date:	8/23/01	Time: 1330		sample collected after dechlorination		**Page 1 of 1**	

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	8.4	-	8.3	24.5	-	24.5	8.0	-	7.8	170	185
Control B	0/20	5	5	5	-	-	8.3	-	-	24.3	-	-	7.8	-	180
Control C	0/20	5	5	5	-	-	8.3	-	-	24.3	-	-	7.8	-	180
Control D	0/20	5	5	5	-	-	8.3	-	-	24.2	-	-	7.8		210
100% A	20/0	5	5	5	7.2	-	8.5	24.6	-	24.2	7.9	-	7.9	1660	1870
100% B	20/0	5	5	5	-	-	8.5	-	-	24.2	-	-	8.1	-	2020
100% C	20/0	5	5	5	-	-	8.5	-	-	24.2	-	-	8.1	-	1920
100% D	20/0	5	5	5	-	-	8.5	-	-	24.1	-	-	8.1	-	2130

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #2 temperature range for the test period was 25.5-26.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 10 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	24.4	24.1	24.5	7.8	8.2	7.7	240	250
Control B	0/500	5	5	5	7.9	8.3	8.5	24.3	23.9	24.4	7.7	8.2	7.6	240	250
Control C	0/500	5	5	5	7.9	8.3	8.5	24.4	23.8	24.1	7.8	7.8	7.6	240	265
Control D	0/500	5	5	5	7.9	8.4	8.5	24.7	23.9	23.8	7.7	8.0	7.6	240	270
100% A	500/0	5	5	5	7.2	8.0	8.2	24.8	23.8	24.3	6.5	8.0	7.7	1700	1720
100% B	500/0	5	5	5	7.2	8.0	8.2	24.7	23.8	24.3	6.5	7.7	7.4	1740	1805
100% C	500/0	5	5	5	7.2	8.0	8.3	24.8	23.8	23.8	6.6	7.6	7.4	1750	1850
100% D	500/0	5	5	5	7.2	8.0	8.3	25.0	23.8	23.8	6.5	7.7	7.5	1750	1925

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-26.0°C.
Incubator #3 temperature range for the test period was 24.0-25.5°C.

Data Transcription Verification	
date:	11/28/01
by:	Victor Brunell
	Della Parker-Hanson

Total Residual CL2	mg/L	Method
Field:	0.06	-
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:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	144	140
20% Dilute Mineral Water (cladocerans):	79	82
100% Sample:	121	337

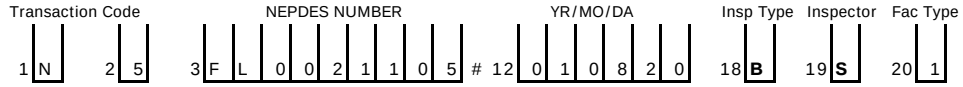
Table 2. Results of chemical analyses on the effluent from Cocoa Beach Water Reclamation Facility sampled on August 20, 2001.

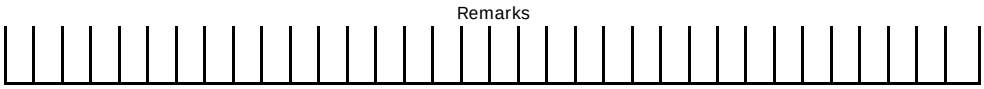
Metals		
Calcium	77.8	mg/L
Iron	88	µg/L [I]
Magnesium	31.5	mg/L
Selenium	2.6	µg/L
Pesticides and Herbicides		
Fonofos	0.14	µg/L [I]
Base, Neutral, & Acid Extractable Organics		
None detected		

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

The Bioassay of Cocoa Beach Water Reclamation Facility effluent sampled on August 20, 2001, NPDES #FL0021105.

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

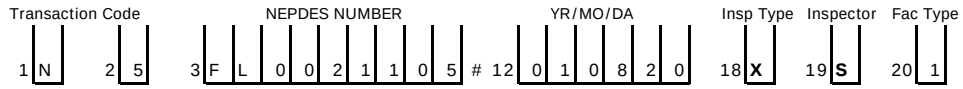


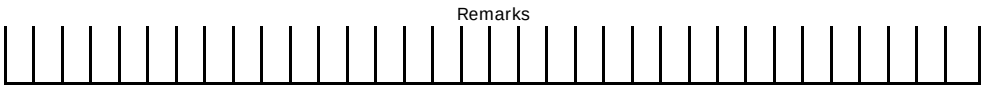


66

The Priority Pollutants Analysis for Bioassay of Cocoa Beach Water Reclamation Facility effluent sampled on August 20, 2001, NPDES #FL0021105.

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





66