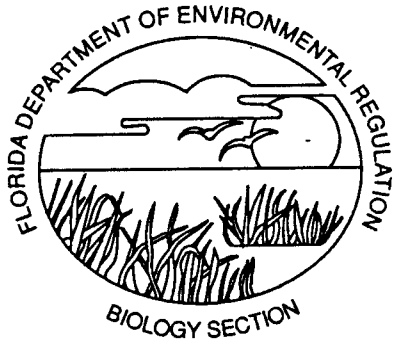


Bioassays of

Key West Sewage Treatment Plant

Key West, Monroe County, Florida

NPDES #FL0025976

1/16/90

FILE COPY
DO NOT REMOVE

February 12, 1990

Biology Section
Division of Administrative and Technical Services

Bioassays of

Key West Sewage Treatment Plant

Key West, Monroe County, Florida

NPDES #FL0025976

Biology Section
Bureau of Laboratories
February 12, 1990

Introduction

Key West Sewage Treatment Plant, Key West, Monroe County, Florida, NPDES #FL0025976, on 17 to 19 January, 1990.

This facility is located on Fleming Key at the Trumbo Annex in Key West. It has a design flow of 7.2 MGD and an average flow of 6.9 MGD. The facility utilizes an activated sludge treatment process consisting of screening and grit removal, aeration, clarification, and chlorine disinfection. The recovered water is dechlorinated at the plant prior to discharge. Due to infiltration, salinity of the influent to this facility ranges from a few ppt to as high as 17 ppt; thus, the discharge is often saline. Discharge is to the Atlantic Ocean.

The toxicity test discussed in this report was performed in accordance with methods described by Peltier and Weber, 1985, *Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms*, 3rd Edition, and by the FDER Biology Section, 1985, *Quality Assurance Manual for Performing Acute Toxicity Tests*, 2nd Edition.

Results and Discussion

A static definitive bioassay was performed on a sample of discharge from this facility using the test organism, *Mysidopsis bahia*. The bioassay indicated that the sample from this facility was not toxic to *M. bahia*. The total and unionized ammonia concentration detected in the sample were 8.62 mg/l and 0.07 mg/l, respectively. No further chemical analyses were performed on the sample.

Conclusion

The sample of discharge from this facility was not toxic on 16 January, 1990.

Table 1. Concentration Series and Volumes Used for These Static Bioassays.

Mysidopsis bahia (mysid shrimp)

Concentration	Dilution Water	Sample	Total Volume
Control	500 ml	0 ml	500 ml
30.0%	350 ml	150 ml	500 ml
70.0%	150 ml	350 ml	500 ml
85.0%	75 ml	425 ml	500 ml
100.0%	0 ml	500 ml	500 ml

Table 2. Data recorded during the 48 hour static definitive bioassay of a sample of dechlorinated discharge from the Key West Sewage Treatment Plant, Key West, Monroe County, Florida, NPDES #FL0035976, on 17 to 19 January, 1990.

Facility:	**Key West STP**		**NPDES #**	**FL0025976**	Facility Type: **Sewage Treatment**
Location:	Grumbo Point Annex, Fleming Key, Key West		Contact/District:	G. Rios / South	
County:	Monroe		Test type:	Static Definitive	
Sample Collection Date:	**1/16/90**	Time: 1150	# tests:	1	Receiving Water: Atlantic Ocean
Test Beginning Date:	1/17/90	Time: 1530	Chlorination Type:	**dechlorinated**	
Test Ending Date:	1/19/90	Time: 1400	Dechlor Method:	Facility dechlorination unit	**Page 1 of 1**

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

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water :	0.24	0.02
100% Sample:	8.62	0.07

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water :	-	-
100% Sample:	172	-

Salinity (ppt)	
Control Water:	15
100% Sample:	15

Organism: ***Mysidopsis bahia*** Age: Juveniles < 3mm
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL			Dissolved Oxygen			pH			Temperature			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	7.9	7.6	7.1	8.2	8.0	7.7	22.0	19.9	19.6	-	-
Control	5	5	5	7.9	7.7	7.1	8.2	8.0	7.7	-	-	-	19300	19000
30%	5	5	5	8.0	7.6	7.3	7.9	7.9	7.7	21.2	19.8	19.3	-	-
30%	5	5	5	8.0	7.6	7.3	7.9	7.9	7.7	-	-	-	20000	19800
70%	5	5	5	8.2	7.8	7.3	7.5	7.8	7.8	19.9	19.8	19.3	-	-
70%	5	5	5	8.2	7.7	7.3	7.5	7.8	7.8	-	-	-	20800	21100
85%	5	5	5	8.3	7.5	7.4	7.4	7.8	7.8	19.8	19.8	19.4	-	-
85%	5	5	5	8.4	7.5	7.5	7.4	7.8	7.8	-	-	-	21300	21800
100%	5	5	5	8.3	7.5	7.3	7.3	7.8	7.8	19.4	19.9	19.7	-	-
100%	5	5	5	8.3	7.5	7.4	7.3	7.8	7.8	-	-	-	21700	22400

GRUMBO PT. ANNEX

DER Biology Section — Acute-bioassay Bench Sheet

Sample Source: Key West WWTP
Address/City: Grumbo Point Annex, Fleming, Key West
County: Monroe
Contact/District: G. Rios / South
NPDES Permit #: FL0025976 **Outfall #:** 000

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

Remarks: Dechlor in-plant

Sample Collection: Date 1-16-90 Time 1150
Test Beginning: Date 1-17-90 Time 1530
Test Ending: Date 1-19-90 Time 1400
Test Organism: ~~N. Incerta~~ Mysidopsis Bahia
Life Stage/Age: ~~1-day~~ Juvenile (2-3 mm)

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7@7, 7@9	8.7@23°C	13%@1337, 24%@2300	22.0@22.0
24 hr	7@7, 9@9	8.8@22°C	134@1338@24%	21.8@ 21.8°C
48 hr	7@7, 9@9	9.0@21°C	1.29@22°C@13%	21.0@21.1°C

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	129	5	5	5	7.9	7.6	7.1	8.2	8.0	7.7	22.0	19.4	19.6			
Control	19	5	5	5	7.9	7.7	7.1	8.2	8.0	7.7				19,300		19000
30 %	~~19~~ 13	5	5	5	8.0	7.6	7.3	7.9	7.9	7.7	21.2	19.8	19.3			
30 %	~~16~~ 6	5	5	5	8.0	7.6	7.3	7.9	7.9	7.7				20,000		19,800
70 %	~~13~~ 142	5	5	5	8.2	7.8	7.3	7.5	7.8	7.8	19.9	19.8	19.3			
70 %	~~6~~ 14	5	5	5	8.2	7.7	7.3	7.5	7.8	7.8				20,800		21,100
85 %	~~10~~ 39	5	5	5	8.3	7.5	7.4	7.4	7.8	7.8	19.8	19.8	19.4			
85 %	~~63~~ 164	5	5	5	8.4	7.5	7.5	7.4	7.8	7.8				21,300		21,300
100 %	~~14~~ 217	5	5	5	8.3	7.5	7.3	7.3	7.8	7.8	19.4	19.9	19.7			
100 %	~~14~~ 76	5	5	5	8.3	7.5	7.4	7.3	7.8	7.8				21,700		22,400
Measured by:		MF	MF	MF	JMF	MF	MF	JMF	MF	MF	JMF	MF	MF	JMF		MF
Recorded by:		MF	MF	MF	SHW	MF	MF	SHW	MF	MF	SHW	MF	MF	SHW		MF

Salinity 14.9 MF

Investigators' Signatures

Marshall Faircloth
Steven H Wolfe

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:	—	—	~~0~~		
Lab Tot. Resid. Cl2:	—	—	0	Hach	SHW
Alkalinity:			172	Hach	SHW
Hardness:			—		
Total Ammonia:	.024		8.62		

Salt

slope = −56.9