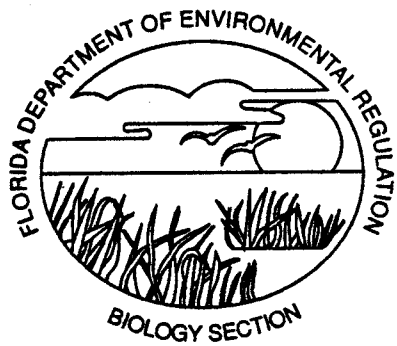


Bioassays of

Avondale Wastewater Treatment Plant

Pensacola, Escambia County, Florida

NPDES #FL0031081

Sampled 8/13, 15, 17/90

December 18, 1990

Biology Section
Division of Administrative and Technical Services

Bioassays of

Avondale Wastewater Treatment Plant

Pensacola, Escambia County, Florida

NPDES #FL0031081

Biology Section
Bureau of Laboratories
December 18, 1990

Introduction

Avondale WWTP, Pensacola, Escambia County, Florida, NPDES #FL0031801, 14 to 20 August, 1990.

This facility is located 800 feet west of the intersection of Blue Angel Parkway and Muldoon Road in Pensacola. The facility has a design capacity of 2.0 MGD and an average flow of 0.63 MGD. Treatment of the recovered water includes screening, biological BOD removal, nitrification, denitrification, filtration, disinfection by chlorination, and dechlorination prior to discharge. Reclaimed water is discharged to Bayou Marcus Creek.

The Biology Section performed bioassays on three samples of discharge from this facility. The tests were performed using methods described by Weber and Peltier in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, 2nd Edition. The samples were collected on 13, 15, and 17 August, 1990, by FDER NW District personnel.

Results and Discussion

The Biology Section performed the Cladoceran survival and reproduction chronic renewal bioassays, using the water flea, *Ceriodaphnia dubia*, on the samples of discharge collected from this facility. The tests indicated that the samples did not adversely affect the survival or reproduction of the test organisms. A total residual chlorine concentration of 0.09 mg/l (Hach) was detected in sample "B", collected on 15 August. A total ammonia concentration of 0.32 mg/l (Orion) was measured in sample "C", collected on 17 August. No further chemical analyses were performed on the samples.

Conclusion

The samples of discharge collected from this facility were not toxic on 13, 15, and 17 August, 1990.

Table 1. Data recorded during the static renewal chronic bioassay performed on samples of discharge from the Avondale WWTP, NPDES #FL0031801, Pensacola, Escambia County, Florida, on 14 to 20 August, 1990.

Facility:	Avondale WWTP		Test Beginning Date:	8/14/90	Time:	1030	Facility Type: Sewage Treatment
NPDES #	FL0031801	Outfall # 001	Test Ending Date:	8/20/90	Time:	1100	Chlorination Type: chlorinated
Location:	Pensacola						
County:	Escambia		Sample "A" Collection Date:	8/13/90	Time:	1301	Receiving Water: Bayou Marcus Creek
Contact/District:	G. Butts		Sample "B" Collection Date:	8/15/90	Time:	1130	
Sample Log #:	98		Sample "C" Collection Date:	8/17/90	Time:	0852	Page 1 of 2

Total Residual Cl2	mg/l
Sample "A" Field:	-
Sample "A" Lab:	<0.02
Sample "B" Field:	<0.1
Sample "B" Lab:	0.09
Sample "C" Field:	-
Sample "C" Lab:	<0.02

Ammonia	Total (mg/l)	Unionized (mg/l)
Diluent Batch "A":	0.00	0.00
Diluent Batch "B":	-	-
Sample "A":	0.00	0.00
Sample "B":	0.00	0.00
Sample "C":	0.32	0.02

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)	Salinity
Diluent Batch "A":	110	150	0
Diluent Batch "B":	-	-	-
Sample "A":	105	105	0
Sample "B":	115	130	0
Sample "C":	105	120	0

Diluent Batch Use	Days Used
Diluent Batch "A":	6
Diluent Batch "B":	

NOEC: - LOEC: -

SURVIVAL

Concentrations	# surviving adults	Young/adult
Control	10	17.0
6.00%	10	14.1
12.0%	10	15.7
25%	10	16.3
50%	10	15.5
100%	10	17.1

		pH	Temp	DO	Cond
Day 0	Control	8.3	22.8	8.2	335.0
New Sample	6.25%	8.2			355.0
	12.5%	8.1			365.0
	25%	8			390.0
	50%	7.7			435.0
	100%	7.4	23.8	7.9	515.0
Day 1	Control	8.3	23.7	8.5	335.0
New Sample	6.25%	8.3			355.0
	12.5%	8.2			365.0
	25%	8.0			390.0
	50%	7.7			445.0
	100%	7.4	25.8	8.2	530.0
Old Sample	Control	8.3		8.7	
	6.25%	8.3		8.6	
	12.5%	8.4		8.8	
	25%	8.4		8.5	
	50%	8.4		8.6	
	100%	8.4		8.6	
Day 2	Control	8.3	23.3	8.6	335.0
New Sample	6.25%	8.3			355.0
	12.5%	8.2			370.0
	25%	8.1			395.0
	50%	7.8			440.0
	100%	7.6	24.4	7.8	535.0
Old Sample	Control	8.3		8.4	
	6.25%	8.4		8.4	
	12.5%	8.4		8.4	
	25%	8.4		8.4	
	50%	8.4		8.4	
	100%	8.4		8.5	

		pH	Temp	DO	Cond
Day 3	Control	8.4	23.5	8.0	340.0
New Sample	6.25%	8.3			370.0
	12.5%	8.1			385.0
	25%	8.1			390.0
	50%	7.9			430.0
	100%	7.6	24.1	7.5	520.0
Old Sample	Control	8.4		7.7	
	6.25%	8.4		7.8	
	12.5%	8.4		7.7	
	25%	8.4		7.8	
	50%	8.4		7.7	
	100%	8.4		7.8	
Day4	Control	8.5	23.4	8.1	340.0
New Sample	6.25%	8.4			350.0
	12.5%	8.3			360.0
	25%	8.0			385.0
	50%	7.7			420.0
	100%	7.3	24.5	8.0	505.0
Old Sample	Control	8.4		7.7	
	6.25%	8.5		7.7	
	12.5%	8.5		7.7	
	25%	8.5		7.7	
	50%	8.5		7.8	
	100%	8.5		7.8	
Day 5	Control	8.4	22.9	8.2	335.0
New Sample	6.25%	8.3			360.0
	12.5%	8.2			365.0
	25%	8.0			380.0
	50%	7.7			420.0
	100%	7.3	24.1	8.3	500.0
Old Sample	Control	8.3		7.9	
	6.25%	8.2		7.9	
	12.5%	8.2		7.8	
	25%	8.2		7.9	
	50%	8.2		7.9	
	100%	8.2		7.9	

-continued-

Table 1. Continued.

Facility:	Avondale WWTP		Test Beginning Date:	8/14/90	Time:	1030	Facility Type: Sewage Treatment
NPDES #	FL0031801	Outfall # 001	Test Ending Date:	8/20/90	Time:	1100	Chlorination Type: chlorinated
Location:	Pensacola						
County:	Escambia		Sample "A" Collection Date:	8/13/90	Time:	1301	Receiving Water: Bayou Marcus Creek
Contact/District:	G. Butts		Sample "B" Collection Date:	8/15/90	Time:	1130	
Sample Log #:	98		Sample "C" Collection Date:	8/17/90	Time:	0852	Page 2 of 2

Total Residual Cl2	mg/l
Sample "A" Field:	-
Sample "A" Lab:	<0.02
Sample "B" Field:	<0.1
Sample "B" Lab:	<0.09
Sample "C" Field:	-
Sample "C" Lab:	<0.02

Ammonia	Total (mg/l)	Unionized (mg/l)
Diluent Batch "A":	0.00	0.00
Diluent Batch "B":	-	-
Sample "A":	0.00	0.00
Sample "B":	0.00	0.00
Sample "C":	0.32	0.00

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)	Salinity
Diluent Batch "A":	110	150	0
Diluent Batch "B":	-	-	-
Sample "A":	105	105	0
Sample "B":	115	130	0
Sample "C":	105	120	0

Diluent Batch Use	Days Used
Diluent Batch "A":	6
Diluent Batch "B":	-

NOEC: - LOEC: -

SURVIVAL

Concentrations	# surviving adults	Young/adult
Control	10	17.0
6.00%	10	14.1
12.0%	10	15.7
25%	10	16.3
50%	10	15.5
100%	10	17.1

		pH	Temp	DO	Cond
Day 6 *	Control	8.2		7.8	
Old Sample	6.25%	8.3		7.7	
	12.5%	8.2		7.8	
	25%	8.2		7.7	
	50%	8.2		7.5	
	100%	8.2		7.7	

* Test terminated at day six

Sample Source: AVONDALE LOW TP

NPDES Permit #: FL0031801 Outfall #: 001

Log #: 98 Chow Batch #: 1 Algae Batch #: 1

DEPARTMENT OF ENVIRONMENTAL REGULATION

BIOLOGY LABORATORY CHRONIC BIOASSAY

Ceriodaphnia dubia BENCH SHEET

		Replicate Number												Young
Conc.	Day	1	2	3	4	5	6	7	8	9	10	# Young	# Adults	Adult
Lab control / SW Control	1											0	10	0
	2											0	10	0
	3	0	0	2	0	0	0	0	0	0	0	2	10	0.2
	4	3	0#	5	2	1	3	3	3	4	4	30	10	3.0
	5	6	0	0	7	8	5	6	8	8	8	56	10	5.6
	6	9	0	11	9	9	7	8	9	10	10	82	10	8.2
	7													
	8													
	Total											170	10	17.0
Lab control / SW 6.25%	1											0	10	0
	2											0	10	0
	3	x	x	x	x							0	10	0
	4	2	4	2	2	2	2	3	3	2	2	24	10	2.4
	5	4	7	7	7	6	5	5	9	6	4	60	10	6.0
	6	8	9	8	8	8	9	7	0	0	0	57	10	5.7
	7													
	8													
	Total													14.1
12.5%	1											0	10	0
	2											0	10	0
	3											0	10	0
	4	2	3	4	2	3	2	2	2	3	4	27	10	2.7
	5	4	4	8	6	7	8	6	4	8	8	63	10	6.3
	6	2	0	9	8	9	8	8	8	9	8	67	10	6.7
	7													
	8													
	Total													15.7
25%	1											0	10	0
	2											0	10	0
	3											0	10	0
	4	4	3	2	2	2	2	4	4	2	2	27	10	2.7
	5	6	6	6	6	6	5	8	8	6	8	65	10	6.5
	6	9	9	10	8	8	7	11	10	0	0	71	10	7.1
	7													
	8													
	Total													11.2
50%	1											0	10	0
	2											0	10	0
	3											0	10	0
	4	2	2	4	2	2	4	2	2	3	3	26	10	2.6
	5	6	6	7	6	6	8	6	7	7	8	67	10	6.7
	6	9	10	9	8	8	0	8	9	1	0	62	10	6.2
	7													
	8													
	Total													15.5
100%	1											0	10	0
	2											0	10	0
	3	0	0	0	0	0	4	0	0	0	0	4	10	0.4
	4	3	2	2	2	3	0	2	2	2	2	22	10	2.2
	5	7	6	6	6	8	8	6	6	5	5	63	10	6.3
	6	8	7	10	9	11	10	8	10	9	0	82	10	8.2
	7											~~HH~~	~~HH~~	~~HH~~
	8													
	Total											171	10	17.1

Day:	0	1	2	3	4	5	6	7	8
Counted by:	HF	MF	SW	MF	SW	MF	SW		

Sample Collection
A: Date 8/13/96 Time 1300
B: Date 8/15/96 Time 1120
C: Date 8/17/96 Time 0845

Begin Test: Date 8/14/96 Time 1030

End Test: Date 8/[illegible] Time [illegible]

Instrument Calibrations:

	Day 0	Day 5
pH	7@7.9@7.7	7@7.9@7.9
DO	8.6@23.4	8.5@24°C
Cond	1384@24.0°C	1345@23.5°C
Temp	22.3@22.7°C	24.0@24.2

	Day 1	Day 6
pH	7@7.9@7.9	7@7.9@7
DO	8.4@25.8	8.4@24°C
Cond	1416@25.5°C 1416	1320@24°C
Temp	24.1@24.1°C	23.7@23.5°C

	Day 2	Day 7
pH	7@7.9@7.9	
DO	8.5@24.0	
Cond	1416@25.5°C	
Temp	23.7@23.6	

	Day 3	Day 8
pH	7@7.9@7.9	
DO	8.5@24°C	
Cond	1377@24°C	
Temp	23.3@23.4	

	Day 4
pH	7@7.9@7.9
DO	8.5@24°C
Cond	1376@23.9°C
Temp	23.3@23.4

Remarks: Day 4 control line put through by mf on Day 3.

A. appeared to be a young one just newly released by female or just died

Investigators' Signatures

[illegible]

Reviewer

Sample Source: Hydrolite WWTP

NPDES Permit #: FL0031801 Outfall #: _____

Log #: 98

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
BIOLOGY LABORATORY CHRONIC BIOASSAY

Ceriodaphnia dubia CHEMISTRY BENCH SHEET

		New Sample				Old Sample	
	Conc.	pH (SU)	Temp (°C)	DO (mg/l)	Cond (µmhos/cm)	pH (SU)	DO (mg/l)
Day 0 Sample A Meas. by HF Record. by SW	Control	8.3	22.8	8.2	335		
	6.25%	8.2			355		
	12.5%	8.1			365		
	25%	8.0			340		
	50%	7.7			435		
	100%	7.4	23.8	7.9	515		
Day 1 Sample A Meas. by SW Record. by MF	Control	8.3	23.1	8.5	335	8.3	8.1
	6.25%	8.3			355	8.3	8.0
	12.5%	8.2			365	8.4	8.3
	25%	8.0			370	8.4	8.3
	50%	7.7			445	8.4	8.0
	100%	7.4	23.3	8.2	530	8.4	8.0
Day 2 Sample B Meas. by HF Record. by SW	Control	8.3	23.3	8.0	335	8.3	8.4
	6.25%	8.3			355	8.4	8.4
	12.5%	8.2			370	8.4	8.4
	25%	8.1			395	8.4	8.4
	50%	7.8			440	8.4	8.4
	100%	7.6	24.4	7.8	535	8.4	8.5
Day 3 Sample B Meas. by SW Record. by MF	Control	8.4	23.3	8.0	346	8.4	7.7
	6.25%	8.3			370	8.4	7.8
	12.5%	8.1			385	8.4	7.7
	25%	8.1			390	8.4	7.8
	50%	7.9			430	8.4	7.7
	100%	7.6	24.1	7.5	520	8.4	7.8
Day 4 Sample C Meas. by [illegible] Record. by [illegible]	Control	8.5	23.4	8.1	340	8.4	7.7
	6.25%	8.4			350	8.5	7.7
	12.5%	8.3			360	8.5	7.7
	25%	8.3			385	8.5	7.7
	50%	7.7			420	8.5	7.8
	100%	7.3	24.5	7.6	505	8.5	7.8

		New Sample				Old Sample	
	Conc.	pH (SU)	Temp (°C)	DO (mg/l)	Cond (µmhos/cm)	pH (SU)	DO (mg/l)
Day 5 Sample C Meas. by [illegible] Record. by [illegible]	Control	8.1	24.1	8.2	330	8.1	7.9
	6.25%	8.3			360	8.2	7.7
	12.5%	8.2			365	8.2	7.7
	25%	8.0			380	8.2	7.4
	50%	7.7			410	8.2	7.4
	100%	7.3	24.1	8.3	500	8.2	7.4
Day 6 Sample C Meas. by SW Record. by MF	Control					8.2	7.8
	6.25%					8.3	7.7
	12.5%					8.2	7.8
	25%					8.2	7.7
	50%					8.2	7.5
	100%					8.2	7.7
Day 7 Sample ___ Meas. by ___ Record. by ___	Control						
	6.25%						
	12.5%						
	25%						
	50%						
	100%						
Day 8 Sample ~~X~~ Meas. by ___ Record. by ___	Control						
	6.25%						
	12.5%						
	25%						
	50%						
	100%						

Water-quality Parameters

	Field Cl2	Lab Cl2	Alkalinity	Hardness	NH3-NH4
Sample A:	None Detected	<0.02	105	117	0.0
Method	—	Hach	[illegible]	[illegible]	[illegible]
Measured by	—	SW	RF	[illegible]	[illegible]

Cl2 blank: <0.02 Ammonia meter slope: [illegible]

Sample B:	<0.1	<0.1	115	120	5.0
Method	HR 100	Hach	Hach	Hach	Orion Ammonia
Measured by	RL	RF	RF	RF	MF

Cl2 blank: 0.0 Ammonia meter slope: -55.7

Sample C:	None Detected	<0.02	105	125	0.120
Method	—	Hach	Hach	Hach	Orion Ammonia
Measured by	—	SW	RF	RF	MF

Cl2 blank: <0.2 Ammonia meter slope: -55.2

Remarks: Sample B dechlorinated before use on Day 2. On Day 3, no residual chlorine detected so dechlor. not performed.

Investigators' Signatures

[signature] _____

[signature] _____

Reviewer

Diluent batch # 1 Days Used: 0 - _____

Diluent batch # _____ Days Used: _____