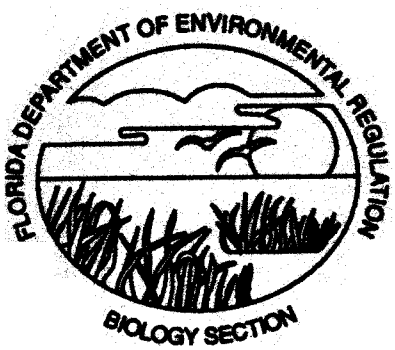


Bioassays of
Bay County Regional WWTP Aeration Lagoon
Bay County, Florida
NPDES #FL0002631
Sampled 4/8/91

May 9,1991

Biology Section
Division of Administrative and Technical Services

Bioassays of

Bay County Regional WWTP Aeration Lagoon

Bay County, Florida

NPDES #FL0002631

Biology Section
Bureau of Laboratories
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Introduction

Bay County Regional WWTP Aeration Lagoon, Bay County, Florida, NPDES #FL0002631 on 9 to 12 April, 1991.

This facility, a 59-acre aerated lagoon, is located on Tyndall Air Force Base, across St. Andrew Bay from the Southwest Forest/Arizona Chemical Company paper mill complex. The Bay County facility receives approximately 32 MGD of paper mill discharge from the complex for treatment. Pretreatment at the complex includes primary clarification and nutrient addition. Domestic discharges treated at the aeration lagoon include three sources: the Millville STP, the Bay County System, and Tyndall AFB. Treatment of these discharges include degritting, primary treatment, and chlorination prior to be being pumped to the aerated lagoon. After an approximate 10-day retention in the aerated lagoon, the effluent is pumped through a 1,300 foot pipe to St. Andrew Bay at a discharge depth of 15 feet. This facility has a designated mixing zone in the bay.

The toxicity tests discussed in this report were 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

The FDER Biology Section performed two static acute bioassays using the bioassay test organisms, the water flea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*, on a sample of discharge from this facility. At the end of the 48-hour test the district requested that the tests be extended to 72 hours. The test organisms were not fed for the duration of the tests. The effluent was aerated prior to loading because of low dissolved oxygen levels.

The 72-hour test results indicated that the effluent was not toxic to either test organism. Total residual chlorine and total ammonia were not detected in the sample. No further chemical analyses were performed.

Conclusion

The sample of effluent from this facility was not toxic on 8 April, 1991.

Table 1. Concentration Series and Volumes Used for the Bay County Regional WWTP Static Bioassays on 9 to 12, April, 1991.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20.0 mL	0.0 mL	20 mL
100.0%	0.0 mL	20.0 mL	20 mL

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100.0%	0 mL	500 mL	500 mL

Table 2. Data recorded during the static screening bioassay of a sample of discharge from the Bay County Regional WWTP Aeration Lagoon, Bay County, Florida, NPDES# FL0002631, on 9 to 12 April, 1991.

Facility:	**Bay County Regional WWTP Aeration Lagoon**	NPDES #	FL0002631	Facility Type:	**sewage treatment paper mill**
Location:	Military Point, Tyndall Air Force Base	Contact/District:	G. Butts / NW		
County:	Bay	Test type:	static screening		
Sample Collection Date:	**4/8/91** Time: 1145	# tests:	2	Receiving Water:	St. Andrew Bay
Test Beginning Date:	4/9/91 Time: 1130	Chlorination Type:	**no measureable residual chlorine**		
Test Ending Date:	4/12/91 Time: 1230			**Page 1 of 2**	

Total Residual Cl2	mg/l	Method
Field:	0.0	Hach
Lab:	0.0	Hach
Lab:	-	-
	Alkalinity	**Hardness**
Alk & Hardness	(mg/l)	(mg/l)
Control Water (fish):	115	140
Control Water (daphnids):	65	85
100% Sample:	120	155
Salinity (ppt)		
Control Water:	0	
100% Sample:	0	

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL				Dissolved Oxygen				pH				Temperature				Conductivity			
Concentrations	# at 0 hr	Live at 24 hr	48 hr	72 hr	0 hour	24 hour	48 hour	72 hour	0 hour	24 hour	48 hour	72 hour	0 hour	24 hour	48 hour	72 hour	0 hour	24 hour	48 hour	72 hour
Control	5	5	5	5	8.0	8.6	8.4	9.4	8.2	8.4	8.2	8.3	22.0	21.8	22.0	21.8	178	173	188	181
Control	5	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Control	5	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Control	5	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100.0%	5	5	5	5	4.0	7.8	8.5	8.8	7.2	8.2	8.1	8.2	21.0	21.9	21.5	21.9	1620	1615	1639	1640
100.0%	5	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100.0%	5	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100.0%	5	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Organism: ***Notropis leedsi*** Life stage: 20 days
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL				Dissolved Oxygen				pH				Temperature				Conductivity			
Concentrations	# at 0 hr	Live at 24 hr	48 hr	72 hr	0 hour	24 hour	48 hour	72 hour	0 hour	24 hour	48 hour	72 hour	0 hour	24 hour	48 hour	72 hour	0 hour	24 hour	48 hour	72 hour
Control	5	5	5	5	8.0	8.2	8.0	8.2	7.7	8.2	8.3	8.4	20.5	21.2	21.0	21.2	-	-	-	-
Control	5	5	5	5	8.2	8.2	8.0	8.2	7.7	8.2	8.2	8.4	-	-	-	-	243	246	250	252
100%	5	5	5	5	3.0*	8.4	5.3	5.6	7.0	8.2	7.9	7.9	19.0	21.3	21.0	21.2	-	-	-	-
100%	5	5	5	5	2.7*	8.5	5.4	5.7	7.0	8.2	7.8	7.9	-	-	-	-	1647	1721	1750	1758

*aerated to 7.1 and 6.6, respectively

Sample Source: #4 Bay County WWTP Lagoon Discharge
Address/City:
County: Bay
Contact/District: New Green Baths
NPDES Permit #: Outfall #:
Test Number: 2 of 8
Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Remarks:

Sample Collection: Date 4-5-91 Time
Test Beginning: Date 4-9-91 Time 1131
Test Ending: Date 4-12-91 Time 1230
Test Organism: C. dubia
Life Stage/Age: 72 hrs

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr				
24 hr				
48 hr				

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	A	5		5/5	8.0	8.6	8.4	8.2	8.4	8.2	22.0	21.8	22.0	178	173	186
Control	B	5		5/5												
Control	C	5		5/5												
Control	D	5		5/5												
100%	A	5		5/5	4.0	7.8	8.5	7.2	8.2	8.1	21.0°	21.9	21.5	1620	1615	1630
100%	B	5		5/5												
100%	C	5		5/5												
100%	D	5		5/5												
		72 hours														
control	A	5			9.4			8.3			21.8			181		
100%	A	5			8.8			8.2			21.9			1640		
					MF			MF			MF			MF		
					KP			KP			KP			KP		

Measured/Loaded by: KP | | | KP | MF | KP | KP | MF | KP | KP | MF | KP | KP | MF | KP
Recorded by: KP | | | AJ | KP | AJ | AJ | KP | AJ | AJ | KP | AJ | AJ | KP | AJ

Investigators' Signatures

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid Cl2:					
Alkalinity:					
Hardness:					
Total Ammonia:					

Ammonia meter slope:

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: #4 Bay County WWTP Lagoon Discharge — Sample Collection: Date 4-8-91 Time 11:45
Address/City: — Test Beginning: Date 4-9-91 Time 11:30
County: Bay — Test Ending: Date 4-11-91 Time 11:30
Contact/District: New Glenn Butts — Test Organism: N. Arcuata
NPDES Permit #: — Outfall #: — Life Stage/Age: 30 days

Test Number: 71 of 78 — Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Remarks: * aerated to 7.1 & 6.6 before loading

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7.969	8.7@22.5	1496@24.1	21.9@24.0 C
24 hr	See Stock Containers			
48 hr				

		Number Live			DO (mg/l)			pH			Temp. (°C)			Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	20	5	5	5	8.0	8.2	8.0	7.7	8.2	8.3	20.5	21.2	21.0			
Control	48	5	5	5	8.2	8.2	8.0	7.7	8.2	8.2				243	246	250
100%	67	5	5	5	8.0*	8.4	5.3	7.0	8.2	7.9	19.0	21.3	21.0			
100%	53	5	5	5	2.7*	8.5	5.4	7.0	8.2	7.8				1647	1721	1752
		72 hours												→		
Control	20	5			8.2			8.4			21.2					
Control	48	5			8.2			8.4						252		
100%	67	5			5.6			7.9			21.2					
100%	53	5			5.7			7.9						1758		
		MF			MF			MF			MF			MF		
		KP			KP			KP			KP			KP		
Measured/Loaded by:		MF	MF	MF	KP	MF	KP	KP	MF	KP	KP	MF	KP	KP	MF	MF
Recorded by:		MF	MF	MF	KP	KP	AJ	AJ	KP	AJ	AJ	KP	AJ	AJ	KP	AJ

Investigators' Signatures

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Clz:					
Lab Tot. Resid. Clz:					
Alkalinity:					
Hardness:					
Total Ammonia:					

Ammonia nitrogen steps: