

Bioassays of

St. Andrews Wastewater Treatment Plant

Panama City, Bay County, Florida

NPDES #FL0020451

Sampled 4/8/02

September 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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St. Andrews Wastewater Treatment Plant

Panama City, Bay County, Florida

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Biology Section
Bureau of Laboratories
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Introduction

St. Andrews Wastewater Treatment Plant, 2226 Michigan Avenue, Panama City, Bay County, Florida, NPDES #FL0020451, tests performed on 9 to 11 April 2002.

The St. Andrews Wastewater Treatment Plant has a design flow of 5.0 MGD and an average flow of 2.38 MGD (three month average, January -March 2002). Wastewater is treated by the Bardenpho process. The treatment process consists of biological treatment using activated sludge with biological nutrient removal, followed by secondary clarification, chlorination, dechlorination with sulfur-dioxide gas, and aeration. Wastewater is discharged to the Class III marine waters of St. Andrews Bay. Sludge from the treatment plant is dewatered, pressed, and removed for land application (facility information provided by Glenn Butts, FDEP, Pensacola).

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 the St. Andrews WWTP. The freshwater test species, the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*, were used in these bioassays. The test results did not indicate toxicity to either test species within 48 hours (Table 1).

The total residual chlorine (TRC) concentration in the bioassay sample was not measured in the field and was less than the laboratory detection limit of 0.03 mg/L in the bioassay sample in the laboratory. Total ammonia was not detected in the bioassay sample. The total ammonia concentration in the sample submitted for chemical analysis was 0.063 mg/L (data qualified as improperly preserved). Additional samples of effluent were collected from this facility and analyzed for herbicides, nutrients, metals, organic compounds, and pesticides. Nutrients, several metals, and the herbicide, atrazine, were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on April 8, 2002, did not show acute toxicity to either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the St. Andrews Wastewater Treatment Plant, 2226 Michigan Avenue, Panama City, Bay County, Florida, NPDES# FL0020451, performed from 9 to 11 April 2002.

Facility:	**St. Andrews Wastewater Treatment Plant**	**NPDES #**	**FL0020451**	Facility Type:	**Wastewater**	**Analysts:**	Della Parker-Hanson
Location:	2226 Michigan Avenue, Panama City	Contact/District:	Glenn Butts/Northwest		**Treatment**		Joshua Ayres
County:	Bay	Test type:	static acute screen				Gary Hardie
Sample Collection Date:	4/8/2002 Time: 1025	# tests:	2	Receiving Water:	St. Andrews Bay		Marshall Faircloth
Test Beginning Date:	4/9/2002 Time: 1215	Chlorination Type:	Chlorinated	Classification:	Class III Marine		
Test Ending Date:	4/11/2002 Time: 1300		sample collected after dechlorination		**Page 1 of 1**	**Reviewer:**	David Whiting

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	8.1	-	8.2	23.6	-	24.1	8.3	-	7.8	155	200
Control B	0/20	5	5	5	-	-	8.2	-	-	24.1	-	-	7.8	-	200
Control C	0/20	5	5	5	-	-	8.2	-	-	24.0	-	-	7.8	-	200
Control D	0/20	5	5	5	-	-	8.2	-	-	23.9	-	-	7.8	-	200
100% A	20/0	5	5	5	7.4	-	8.0	24.5	-	24.0	8.4	-	7.9	505	590
100% B	20/0	5	5	5	-	-	8.0	-	-	23.9	-	-	7.9	-	595
100% C	20/0	5	5	5	-	-	8.0	-	-	23.9	-	-	7.9	-	615
100% D	20/0	5	5	5	-	-	8.0	-	-	23.7	-	-	8.0	-	635

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.5-25.0 °C.
Incubator #3 temperature range for the test period was 24.0-25.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 12 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	7.8	8.4	8.5	23.8	25.0	26.0	7.9	7.0	7.1	260	295
Control B	0/500	5	5	5	7.9	8.4	8.5	23.7	25.3	24.5	8.0	7.1	7.8	255	280
Control C	0/500	5	5	4	7.9	8.4	8.5	23.6	23.5	25.9	8.1	6.9	8.0	250	295
Cotnrol D	0/500	5	5	5	7.9	8.4	8.5	23.5	23.6	24.3	8.1	7.3	7.8	255	270
100% A	500/0	5	5	5	7.3	7.9	7.9	26.0	23.6	25.3	8.2	7.3	7.8	530	550
100% B	500/0	5	5	5	7.3	7.9	7.9	26.1	23.9	24.3	8.2	7.4	7.7	520	570
100 % C	500/0	5	5	5	7.3	7.9	7.9	26.1	23.3	25.9	8.2	7.4	7.6	540	605
100% D	500/0	5	5	5	7.3	7.9	7.9	26.1	23.8	24.0	8.2	7.6	7.7	530	570

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.5-25.0°C.
Incubator #3 temperature range for the test period was 24.0-25.5°C.

LIMS	
Job number:	TLH-2002-04-09-02
sample number:	586564

Data Transcription Verification	
date:	9/4/2002
by:	Jacquelyn Brynda
	Christa Pierini

Total Residual CL2	mg/L	Method
Field:	not measured	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (fish):	<0.017	<0.017
Control water (water flea):	<0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	155	151
Control water (water flea):	78	75
100% Sample:	65	82

Table 2. Results of chemical analyses on the effluent from St. Andrews Wastewater Treatment Plant sampled on April 8, 2002.

Metals

Aluminum	98	µg/L	I
Calcium	24.3	mg/L	
Copper	1.1	µg/L	I
Iron	222	µg/L	
Magnesium	4.1	mg/L	
Nickel	2.1	µg/L	I
Silver	0.16	µg/L	
Zinc	13	µg/L	

Nutrients

Ammonia-N	0.063	mg N/L	AY
Nitrite+Nitrate-N	0.12	mg N/L	Y
Total Kjeldahl Nitrogen	1.0	mg N/L	Y
Orthophosphate-P	0.11	mg P/L	Y
Total Phosphorus-P	0.26	mg P/L	Y

Pesticides and Herbicides

Atrazine	2.1	µg/L	J

Base, Neutral, & Acid Extractable Organics

None detected

A Value reported is the mean of two or more determinations.
I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J Estimated value.
Y The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.

The Bioassay of the St. Andrews WWTP effluent sampled on April 8, 2002, NPDES #FL0020451.

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

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 F L 0 0 2 0 4 5 1 #	#	0 2 0 4 0 8	#	**B**	# **S**	# 1

Remarks

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The Priority Pollutants Analysis for the Bioassay of the St. Andrews WWTP effluent sampled on April 8, 2002, NPDES #FL0020451.

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

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 F L 0 0 2 0 4 5 1 #	#	0 2 0 4 0 8	#	**X**	# **S**	# 1

Remarks

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