

Bioassays of

St. Andrews Wastewater Treatment Facility

Panama City, Bay County, Florida

NPDES #FL0020451

Sampled 9/16/96

FILE COPY
DO NOT REMOVE

November 1996

Biology Section
Division of Administrative and Technical Services
Comprehensive Quality Assurance Plan #870346G

Bioassays of

St. Andrews Wastewater Treatment Facility

Panama City, Bay County, Florida

NPDES #FL0020451

Biology Section
Bureau of Laboratories
November 1996

Introduction

St. Andrews WWTF, 3501 West 23rd Street, Panama City, Bay County, Florida, NPDES #FL0020451, tests performed on 17 to 19 September, 1996.

This wastewater treatment facility has a design flow of 5.0 MGD and an annual average flow of 3.2055 MGD (7/95-6/96). The facility provides advanced wastewater treatment using the Bardenpho process. Treated effluent is dechlorinated prior to discharge to St. Andrew Bay (facility summary provided by Lisa Kelly, 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 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 (Table 1).

Total residual chlorine and total 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 September 16, 1996, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the St. Andrews WWTF, Panama City , Bay County, Florida, NPDES# FL0020451, performed on 17 to 19 September, 1996.

Facility:	**St. Andrews WWTF**		**NPDES #**	**FL0020451**	Facility Type: **Wastewater**
Location:	3501 West 23rd Street, Panama City		Contact/District:	Glenn Butts/Northwest	**Treatment Facility**
County:	Bay		Test type:	static acute screen	
Sample Collection Date:	**9/16/96**	Time: 1015	# tests:	2	Receiving Water: St. Andrew Bay
Test Beginning Date:	9/17/96	Time: 1500	Chlorination Type:	Chlorinated	
Test Ending Date:	9/19/96	Time: 1500		Sample collected after plant dechlorination unit.	**Page 1 of 1**

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours old

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[A] 0 hour	24 hour	48 hour	Dissolved Oxygen 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/20	5	5	5	8.1	-	8.3	23.3	-	23.6	8.1	-	8.3	170	170
Control B	0/20	5	5	5	-	-	8.3	-	-	23.7	-	-	8.4	-	175
Control C	0/20	5	5	5	-	-	8.3	-	-	23.7	-	-	8.3	-	175
Control D	0/20	5	5	5	-	-	8.3	-	-	23.7	-	-	8.3	-	175
100% A	20/0	5	5	5	7.8	-	8.4	23.8	-	23.7	7.7	-	8.3	480	455
100% B	20/0	5	5	5	-	-	8.4	-	-	23.7	-	-	8.4	-	460
100% C	20/0	5	5	5	-	-	8.4	-	-	23.6	-	-	8.3	-	460
100% D	20/0	5	5	5	-	-	8.4	-	-	23.6	-	-	8.4	-	495

[A] Temperature of test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 23.3-24.4°C.

Organism: ***Cyprinella leedsi*** Age: 8 and 9 days

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	24 hour	48 hour	Temperature[B] 0 hour	24 hour	48 hour	Dissolved Oxygen 0 hour	24 hour	48 hour	Conductivity Uncorrected µmhos/cm 0 hour	48 hour
Control A	0/500	5	5	5	7.9	8.4	8.5	24.8	23.1	23.5	7.9	8.4	8.3	250	250
Control B	0/500	5	5	5	7.9	8.4	8.5	24.8	23.1	23.4	8.0	8.4	8.2	255	250
Control C	0/500	5	5	5	7.9	8.3	8.5	24.8	23.1	23.4	8.0	8.4	8.3	250	250
Control D	0/500	5	5	5	7.9	8.3	8.5	24.8	23.5	23.7	8.1	8.3	8.4	250	250
100% A	500/0	5	5	5	7.7	8.2	8.3	25.1	23.2	23.6	7.6	8.2	8.1	500	495
100% B	500/0	5	5	5	7.7	8.2	8.3	25.1	23.2	23.5	7.5	8.2	8.1	500	490
100% C	500/0	5	5	5	7.7	8.2	8.3	25.1	23.2	23.4	7.5	8.2	8.2	500	495
100% D	500/0	5	5	4	7.7	8.2	8.3	25.1	23.5	23.7	7.6	8.2	8.2	500	490

[B] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 22.5-24.0°C.

Total Residual CL2	mg/L	Method
Field:	<0.01	-
Lab:	<0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	0.00
20% Dilute Mineral Water (cladocerans):	< 0.017	0.00
100% Sample:	<0.017	0.00

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	120	129
20% Dilute Mineral Water (cladocerans):	69	107
100% Sample:	86	117

Salinity	(ppt)
Control Water:	0
100% Sample:	0

Table 2. Results of chemical analyses on the effluent from the St. Andrews Wastewater Treatment Facility sampled on September 16, 1996.

Metals

Aluminum	63	µg/L
Calcium	41.1	mg/L
Iron	142	µg/L
Lead	0.3	µg/L[I]
Magnesium	3.63	mg/L
Silver	0.45	µg/L
Zinc	20	µg/L

Pesticides and Herbicides

none detected

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.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: St. Andrews WWTP
County: BAY
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL0020451
LIMS Sample #: 152862 LIMS Job #: 96-Sep-17-47
sample log 9-24-96 mf
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 1 of 2
Remarks:

Sample Collection: Date 9-16-96 Time 1015
Test Beginning: Date 9-17-96 Time 1500
Test Ending: Date 9-19-96 Time 1500
Organism Batch #: 39 Diluent Batch #: 40
Organism Age: <24 hours
Test Organism: Ceriodaphnia dubia

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0	25.4 @ 25.4	8.2 @ 25 °C	101.4 @ 101.3
	9.0 @ 9.0			1410 @ 1409 @ 24.6 °C
24 hr	7.0 @ 7.0	24.2 @ 24.3	8.4 @ 24.2 °C	107 @ 101.3
	9.0 @ 9.0			1398 @ 1409 @ 24.2 °C
48 hr	7.0 @ 7.0	23.6 @ 23.6	8.4 @ 23.4 °C	106.6 @ 101.3
	9.0 @ 9.0			1384 @ 1409 @ 24.0 °C
				9700 @ 9997

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) 0 hr	UNCORRECTED Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (µmhos/cm) 48 h
Ctr	A	5	5	5	8.1		8.3	23.3		23.6	8.1		8.3	170		170
Ctr	B	5	5	5			8.3			23.7			8.4			175
Ctr	C	5	5	5			8.3			23.7			8.3			175
Ctr	D	5	5	5			8.3			23.7			8.3			175
100%	A	5	5	5	7.8		8.4	23.8		23.7	7.7		8.3	480		455
100%	B	5	5	5			8.4			23.7			8.4			460
100%	C	5	5	5			8.4			23.6			8.3			460
100%	D	5	5	5			8.4			23.6			8.4			495
Measured/Loaded by:		MF	MF	ND	DW		DW	DW		DW	DW		DW	DW		DW
Recorded by:		MF	MF	DW	ND		DD	ND		DD	ND		DD	ND		DD

Investigators' Signatures

Marshall Faircloth

reviewer

form updated 4/01/96

Water Quality Parameters

	Salt Water Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			<0.01	—	Glenn Butts
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DR100	DW
Alkalinity (mg/L as $CaCO_3$):	120	69	107	Hach	ND
Hardness (mg/L as $CaCO_3$):	129	86	117	Hach	ND
Total ammonia (mg/L as N):	<0.017	<0.017	<0.017	orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -58.1 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: St. Andrews WWTP
County: BAY
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL0020451
LIMS Sample #: 152862 **LIMS Job #:** 96-Sep-17-47
sample log 9-24-96 MF

Test Type: Screening / Definitive
Static / Static Renewal / Flow-through

Test Number: 2 of 2

Remarks:

Sample Collection: Date 9-16-96 Time 1015
Test Beginning: Date 9-17-96 Time 1500
Test Ending: Date 9-19-96 Time 1500
Organism Batch #: 70-71 **Diluent Batch #:** well
Organism Age: 8 and 9 days
Test Organism: Cyprinella leedsi

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	25.4 @ 25.4	8.2 @ 25 °C	101.4 @ 101.3 1410 @ 1409 @ 24.6 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.2 @ 24.3	8.4 @ 24.2 °C	107 @ 101.3 1398 @ 1409 @ 24.2 °C
48 hr	7.0 @ 7.0 7.0 @ 7.0	23.6 @ 23.6	8.9 @ 23.6 °C	106.6 @ 101.3 1384 @ 1409 @ 24.0 °C 9700 @ 9997

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctr A	B13	5	5	5	7.9	8.4	9.5	24.8	23.1	23.5	7.9	8.4	8.3	250	245	250
Ctr B	B14	5	5	5	7.9	8.4	9.5	24.8	23.1	23.4	8.0	8.4	8.2	255	245	250
Ctr C	B15	5	5	5	7.9	8.3	9.5	24.8	23.1	23.4	8.0	8.4	8.3	250	245	250
Ctr D	B16	5	5	5	7.9	8.3	9.5	24.8	23.5	23.7	8.1	8.3	8.4	250	250	250
100% A	B17	5	5	5	7.7	8.2	8.3	25.1	23.2	23.6	7.6	8.2	8.1	500	485	495
100% B	B18	5	5	5	7.7	8.2	8.3	25.1	23.2	23.5	7.5	8.2	8.1	500	485	490
100% C	B19	5	5	5	7.7	8.2	8.3	25.1	23.2	23.4	7.5	8.2	8.2	500	485	495
100% D	B20	5	5	4 [10]	7.7	8.2	8.3	25.1	23.5	23.7	7.6	8.2	8.2	500	490	490
Measured/Loaded by:		DW	DD	ND	DW	MF	MF	DW	MF	MF	DW	MF	MF	DW	MF	MF
Recorded by:		MF	ND	DW	ND	ND	DB	ND	ND	DB	ND	ND	DB	ND	ND	DB

Investigators' Signatures

Water Quality Parameters	Salt Water Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			<0.01	–	Glenn Butts
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DR100	DW
Alkalinity (mg/L as $CaCO_3$) :	120	69	107	Hach	ND
Hardness (mg/L as $CaCO_3$) :	129	86	117	Hach	ND
Total ammonia (mg/L as N) :	<0.017	<0.017	<0.017	Orion	MF

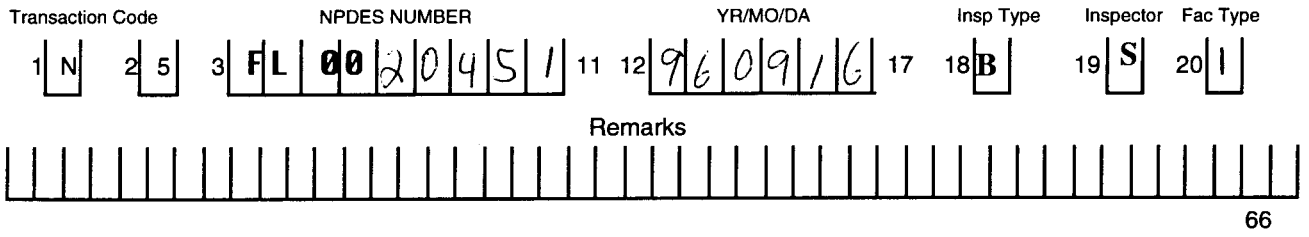
Ammonia Meter #98136 Ammonia Meter Slope: -58.1 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 8 ppt

reviewer

form updated 4/01/96

The Bioassay of the St. Andrews WWTF effluent sampled on September 16, 1996, NPDES #FL0020451.

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



The Priority Pollutants Analysis for the Bioassay of the St. Andrews WWTF effluent sampled on September 16, 1996, NPDES #FL0020451.

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

