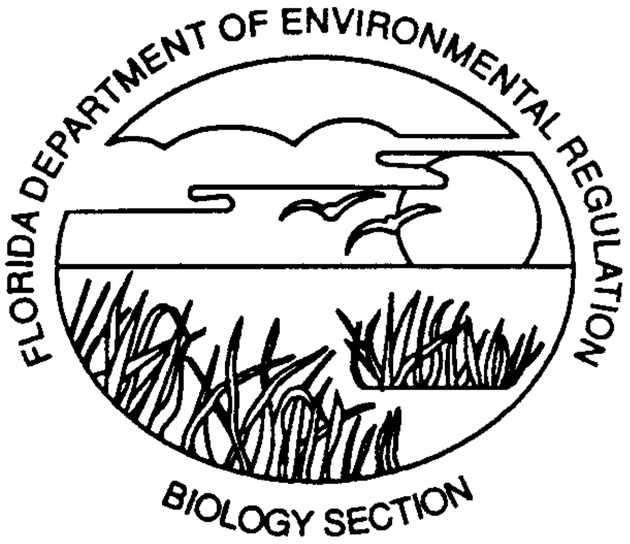


Bioassays of

Anastasia Sanitary District Wastewater Treatment Plant

Anastasia Island, St. Johns County, Florida

NPDES #FL0038831

Sampled 10/22/91

December 5, 1991

Biology Section
Division of Technical Services

Bioassays of

Anastasia Sanitary District Wastewater Treatment Plant

Anastasia Island, St. Johns County, Florida

NPDES #FL0038831

Biology Section
Bureau of Laboratories
December 5, 1991

Introduction

Anastasia Sanitary District WWTP, Anastasia Island, St. Johns County, Florida, NPDES #FL0038831, on 23 to 25 October, 1991.

This facility recently expanded from a 2.0 MGD to a 4.0 MGD complete mix activated sludge sewage treatment. It is located on 16th Street, west of Mizell Road on Anastasia Island. Improvements included replacing side-hill influent screens with mechanical bar screens, adding a sulfur dioxide dechlorination unit, adding a belt sludge thickener in the waste solids flow stream, adding a belt filter press in the sludge dewatering process, and adding a 1.0 MGD capacity granular filter in the effluent flow stream for land application of effluent. The average daily discharge of 1.48 MGD is to the Matanza River with 0.8 MGD disposed of by spray irrigation upon the Marsh Creek County Club golf course.

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 Biology Section performed two static acute screening bioassays on a sample of effluent from this facility. The bioassay test organisms used for these tests were the water flea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*. These tests suggested that the effluent sample was not toxic. Total residual chlorine was not detected in the sample. Total ammonia and unionized ammonia concentrations were 0.96 mg/L and 0.01 mg/L, respectively.

Further chemical analyses detected the presence of metals and nutrients in the sample. The metals present were iron (73 µg/L) and zinc (33 µg/L). The mean values of the nutrients present were nitrate-N (19 mg/L), nitrite/nitrate (18 mg/L), and phosphate (4.8 mg/L).

Conclusion

The sample of effluent from this sample was not toxic on 22 October, 1991.

Table 1. Concentration Series and Volumes Used for The Static Screening Bioassays of the Anastasia Sanitary District WWTP on 23 to 25 October, 1991.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20 mL	0 mL	20 mL
100%	0 mL	20 mL	20 mL

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100%	0 mL	500 mL	500 mL

Table 2. Results of chemical analyses on the sample of effluent from the Anastasia Sanitary District WWTP, St. Johns County, on 22 October, 1991.

Base-Neutral & Acid Extractables

None Detected

Chlorinated Pesticides

None Detected

Metals

Iron	73 µg/L
Zinc	33 µg/L

Nutrients

Nitrate	19 mg/L[a]
Nitrite / Nitrate	18 mg/L[a]
Phosphate	4.8 mg/L

a - Value reported is the mean of two or more determinations.

Table 3. Data recorded during the acute screening bioassay of a sample of effluent from the Anastasia Sanitation District WWTP, Anastasia Island, St. Johns County, Florida, NPDES# FL0038831, on 23 to 25 October, 1991.

Facility:	**Anastasia Sanitary District WWTP**	**NPDES #**	**FL0038831**	Facility Type:	**Sewage Treatment**
Location:	16th Street, west of Mizell Road, Anastasia Island	Contact/District:	K. Kohn / Northeast		
County:	St. Johns	Test type:	static screening		
Sample Collection Date:	**10/22/91** Time: 1156	# tests:	2	Receiving Water:	Matanzas River
Test Beginning Date:	10/23/91 Time: 1400	Chlorination Type:	**chlorinated**		
Test Ending Date:	10/25/91 Time: 1400	Dechlor Method:	Plant dechlorination unit		**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Field:	<0.1	-
Lab:	0.0	Hach

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control Water (daphnids):	0.00	0.00
100% Sample:	0.96	0.01

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	130	130
Cond. Control Water (daphnids):	70	80
100% Sample:	75	140

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours
LC50: -

	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	8.0	-	8.6	8.1	-	8.1	25.0	-	24.0	158	174
Control	5	5	5	-	-	8.6	-	-	8.1	-	-	-	-	-
Control	5	5	5	-	-	8.6	-	-	8.1	-	-	-	-	-
Control	5	5	5	-	-	8.6	-	-	8.1	-	-	-	-	-
100%	5	5	5	8.1	-	8.7	7.3	-	8.1	26.0	-	23.8	732	742
100%	5	5	5	-	-	8.7	-	-	8.1	-	-	-	-	-
100%	5	5	5	-	-	8.7	-	-	8.1	-	-	-	-	-
100%	5	5	5	-	-	8.7	-	-	8.1	-	-	-	-	-

Organism: ***Notropis leedsi*** Age: 16 days
LC50: -

	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	8.5	8.8	7.7	8.1	8.3	23.5	23.9	23.5	-	-
Control	5	5	5	7.9	8.6	8.8	7.7	8.1	8.3	-	-	-	244	247
100%	5	5	5	8.4	8.6	8.8	7.3	7.9	7.9	27.0	23.8	23.5	-	-
100%	5	5	5	8.5	8.5	8.8	7.3	7.8	7.9	-	-	-	804	763

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Anastasia Sanitary WWTP
Address/City:
County: St. Johns
Contact/District: KEN KOHN / NE
NPDES Permit #: FL0038831 Outfall #:

Sample Collection: Date 10/22/91 Time 1156
Test Beginning: Date ~~10/24/91~~ Time KWP
Test Ending: Date 10-25-91 Time 1410
Test Organism: M. beckisi
Life Stage/Age: 1 day/5

TEST BEGAN ON 10/23/91 @ 1400 KWP 10/25/91 0830

Test Number: 2 of 2 Test Type: ~~Screening~~ | Definitive
(Static) | Static Renewal | Flow-through

Remarks:
LIMS # 24696 91-23-OCT-03
entered 10/25/91 KWP

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7.00	8.2@26°	26.0°C 26.1°	1397@24.7 @1399
24 hr	7@7.00	8.4@25°	24.0@24.2	1385@24.2
48 hr	7@7.00	8.4@25°C	24.1@24.0°C	1376@24.0°C

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
CONTROL	21	5	5	5	7.7	8.1	8.3	23.5	23.9	23.5	7.4	8.5	8.8			
CONTROL	147	5	5	5	7.7	8.1	8.3				7.9	8.6	8.8	244	293	247
100%	92	5	5	5	7.3	7.9	7.9	23.0	23.8	23.5	8.4	8.6	8.9			
100%	47	5	5	5	7.3	7.8	7.9				8.5	8.5	8.8	804	753	763
Measured/Loaded by:		MF	MF	AJ	LD	LD	MF	LD	LD	MF	LD	LD	MF	LD	LD	MF
Recorded by:		MF	AJ	AJ	MF	AJ	AJ	MF	AJ	AJ	MF	AJ	AJ	MF	AJ	AJ

Investigators' Signatures

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			< .01		<
Lab Tot. Resid. Cl2:			0.0	HACH	MF
Alkalinity:	130	70	75	HACH	AJ
Hardness:	130	80	140	HACH	AJ
Total Ammonia:	0.0	0.0	0.96	HACH	MF

Ammonia Meter Slope: _____ Ammonia Blank: 0.0 Salinity Sample: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Anastasia Jan. Fory WWTP
Address/City: _____
County: St Johns
Contact/District: Ken Kuhn / NE
NPDES Permit #: FL0038831 Outfall #: _____

Sample Collection: Date 10/22/91 Time 1550
Test Beginning: Date ~~10/24/91~~ Time KWP
Test Ending: Date 10/25/91 Time 1440
Test Organism: C. dubia
Life Stage/Age: ♀ <24 hrs
TEST BEGAN ON 10/23/91 @1400
KWP 10/25/91 ASCO

Test Number: 1 of 2 Test Type: (Screening) Definitive
(Static) Static Renewal | Flow-through

Remarks:

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7.9@9	8.2@26°	26.0@26.1	1397@24.7 1399
24 hr	7@7.9@9	8.4@25°	24.0@24.2	1385@24.2
48 hr	7.7·9@9	8.4@25°C.	24.1@24.0°C	1376@24.0

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
control	A	5	5	5	8.1		8.1	25.0		24.0	8.0	8.1	8.6	158		174
control	B	5	5	5			8.1						8.6			
control	C	5	5	5			8.1						8.6			
control	D	5	5	5			8.1						8.6			
100%	A	5	5	5	7.3		8.1	26.0		23.8	8.1		8.7	732		742
100%	B	5	5	5			8.1						8.7			
100%	C	5	5	5			8.1						8.7			
100%	D	5	5	5			8.1						8.7			
Measured/Loaded by:		MF	MF	MF	LD		MF	LD		MF	LD		MF	LD		MF
Recorded by:		MF	AJ	AJ	MF		AJ	MF		AJ	MF		AJ	MF		AJ

Investigators' Signatures

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			<.01		
Lab Tot. Resid. Cl2:			0.0	HACH	MF
Alkalinity:	130	90	75	HACH	AJ
Hardness:	130	80	140	HACH	AJ
Total Ammonia:	0.0	0.0	0.96	HACH	MF

Ammonia Meter Slope: _____ Ammonia Blank: 0.0 Salinity Sample: _____ ppt