

Bioassays of

Magnolia Springs Apartments Sewage Treatment Plant

Green Cove, Clay County, Florida

NPDES #FL0028568

Sampled 11/13/95

February 1996

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan #870346G

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Introduction

Magnolia Springs Apartments STP, Green Cove Springs, Clay County, Florida, NPDES #FL0028568, tests performed on 14 to 16 November, 1995.

This sewage treatment plant is located on U.S. Highway 17 North, Green Cove Springs. The facility utilizes a bar screen, contact and stabalization tanks, a chlorine contact chamber, and two polishing ponds, and has a design flow of 0.077 MGD. Detention time in the polishing ponds serves to dechlorinate the effluent prior to the discharge of an annual average of 0.066 MGD to an unnamed creek, then to a slough, and ultimately to the St. Johns River. By September 15, 1996, the facility is scheduled either to be upgraded or to eliminate its discharge by tying in to the Green Cove Springs wastewater treatment system (facility summary provided by Kathleen Gerard, FDEP, Jacksonville).

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 tests results did not indicate toxicity (Table 1).

Total residual chlorine was not detected in the sample. Total ammonia and unionized ammonia concentrations were 4.40 mg/L and 0.06 mg/L, respectively. Further chemical analyses were performed on the sample and several metals and an organic compound, 1,4-dichlorobenzene, were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on November 13, 1995, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Magnolia Springs Apartments STP, Green Cove Springs, Clay County, Florida, NPDES# FL0028568, performed on 14 to 16 November,1995.

Facility:	Magnolia Springs Apartments	NPDES #	FL0028568	Facility Type:	Sewage Treatment Plant
Location:	U.S. Highway 17, Green Cove Springs	Contact/District:	Tim Mckelvey/NE		
County:	Clay	Test type:	static acute screen	Receiving Water:	Unnamed creek to a slough to the St. Johns River
Sample Collection Date:	11/13/95 Time: 1145	# tests:	2		
Test Beginning Date:	11/14/95 Time: 1500	Chlorination Type:	Chlorinated		
Test Ending Date:	11/16/95 Time: 1500				Page 1 of 1

Total Residual CL2	mg/L	Method
Field:	none detected	
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:	4.40	0.06

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	125	125
20% Dilute Mineral Water (cladocerans):	75	90
100% Sample:	115	95

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

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

	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	-	8.1	22.1	-	23.1	8.2	-	7.9	180	250
Control B	0/20	5	5	5	-	-	8.1	-	-	23.3	-	-	7.0	-	230
Control C	0/20	5	5	5	-	-	8.2	-	-	23.2	-	-	7.3	-	220
Control D	0/20	5	5	5	-	-	8.1	-	-	23.2	-	-	7.5	-	200
100% A	20/0	5	5	5	7.6	-	8.4	22.1	-	23.2	7.0	-	7.6	350	370
100% B	20/0	5	5	5	-	-	8.4	-	-	23.2	-	-	7.7	-	380
100% C	20/0	5	5	5	-	-	8.4	-	-	23.2	-	-	7.7	-	370
100% D	20/0	5	5	5	-	-	8.4	-	-	23.2	-	-	7.8	-	375

[A] Temperature of test incubator was continously recorded on a strip chart recorde
Incubator temperature range for the test period was 23.8-24.4°C.

Organism: *Cyprinella leedsi* Age: 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	8.0	8.3	22.6	22.3	22.8	8.0	8.1	8.2	240	245
Control B	0/500	5	5	5	7.8	8.0	8.3	22.4	22.2	22.8	8.0	8.0	8.1	240	240
Control C	0/500	5	5	5	7.8	8.1	8.3	22.3	22.0	22.8	8.1	8.0	8.1	240	245
Control D	0/500	5	5	5	7.8	8.1	8.3	22.3	22.0	22.9	8.1	8.0	8.1	240	245
100% A	500/0	5	5	5	7.4	7.8	8.1	22.3	22.3	22.7	5.8	7.1	8.0	365	370
100% B	500/0	5	5	5	7.4	7.8	8.1	22.2	22.2	22.6	5.7	7.1	7.9	365	370
100% C	500/0	5	5	5	7.4	7.8	8.1	22.1	22.1	22.5	5.6	7.2	7.9	365	370
100% D	500/0	5	5	5	7.4	7.8	8.1	22.2	22.0	22.6	5.6	7.2	7.9	365	375

[B] Temperature of test room was continously recorded on a strip chart recorder.
Room temperature range for the test period was 21.0-22.0°C.

Table 2. Results of chemical analyses on the effluent from the Magnolia Springs Apartments sewage treatment plant, sampled on November 13, 1995.

Metals

Calcium	20.8	mg/L
Copper	5	µg/L[I]
Iron	145	µg/L
Magnesium	8.61	mg/L
Zinc	11	µg/L[I]

Pesticides and Herbicides

none detected

Base, Neutral, & Acid Extractable Organics

1,4-dichlorobenzene	1.00	µg/L[T]

I Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit.

T Value reported is less than the criterion of detection.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Magnolia Apartments
County: Clay
Contact / District: Tim McKelvey / NorthEast
NPDES Permit #: FL0028568
LIMS Sample #: 122481 (sample log 11-15-95) LIMS Job #: 95-NOV-14-25

Sample Collection: Date 11-13-95 Time 1145
Test Beginning: Date 11-14-95 Time 1500
Test Ending: Date 11-16-95 Time 1500
Organism Batch #: 53 Diluent Batch #: 45
Organism Age: < 24 hours
Test Organism: Ceriodaphnid dubia

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

Test Number: 1 of 2

Remarks:

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	22.1 @ 22.2	8.7 @ 22.2 °C	109.0 @ 102.3 975 @ 1013 @ 22.4 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.2 @ 21.3	8.5 @ 23.2 °C	140.3 @ 141.3 955 @ 1013 @ 21.5 °C
48 hr	7.0 @ 7.0 9.0 @ ___	21.3 @ 21.3	8.6 @ 22.3 °C	137.1 @ 141.3 948 @ 1013 @ 22.0 °C

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) ~~Cond. (µmhos/cm)~~ 0 hr	UNCORRECTED Cond. (mmhos/cm) ~~Cond. (µmhos/cm)~~ 24 h	UNCORRECTED Cond. (mmhos/cm) ~~Cond. (µmhos/cm)~~ 48 h
Artificial	A	5	5	5	8.1		8.1	22.1		23.1	8.2		7.9	180		250
Control B	B	5	5	5			8.1			23.3			7.0			250
Control C	C	5	5	5			8.2			23.2			7.3			220
Control D	D	5	5	5			8.1			23.2			7.5			200
100% A	A	5	5	5	7.6		8.4	22.1		23.2	7.0		7.6	350		370
100% B	B	5	5	5			8.4			23.2			7.7			380
100% C	C	5	5	5			8.4			23.2			7.7			370
100% D	D	5	5	5			8.4			23.2			7.8			375
Measured/Loaded by:		MF	MF	MF	MF		JN	MF		JN	MF		JN	MF		JN
Recorded by:		MF	DR	MF	DW		DW	DW		DW	DW		DW	DW		DW

Investigators' Signatures

Marshall Faircloth
Jennifer Marth
Robin G. Fieler
Norma D. Rees

reviewer

form updated 5/05/95

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			None Detected	—	Ruth Bowman
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR100	JN
Alkalinity (mg/L as $CaCO_3$):	—	75	115	Hach	JN
Hardness (mg/L as $CaCO_3$):	—	90	95	Hach	JN
Total ammonia (mg/L as N):	—	<0.017	4.40	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.7 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Magnolia apartments
County: Clay
Contact / District: Tim Metelvey
NPDES Permit #: FL0028568
LIMS Sample #: 122481 LIMS Job #: 95-NOV-14-25
(sample log 11-28-95)

Sample Collection: Date 11-13-95 Time 1145
Test Beginning: Date 11-14-95 Time 1500
Test Ending: Date 11-16-95 Time 1500
Organism Batch #: 63 Diluent Batch #: C-1
Organism Age: 12 days old
Test Organism: Cyprinella leedsi

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

Test Number: 2 of 2

Remarks:

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	22.1 @ 22.2	8.7 @ 22.2 °C	109.0 @ 102.3 975 @ 1013 @ 22.4 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	21.2 @ 21.3	8.5 @ 23.2 °C	140.3 @ 141.3 955 @ 1013 @ 21.8 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.3 @ 21.3	8.6 @ 22.3 °C	137.1 @ 141.3 948 @ 1013 @ 22.0 °C

		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
Control A	120	5	5	5	7.8	8.0	8.3	22.6	22.3	22.8	8.0	8.1	8.2	240	240	245
Control B	25	5	5	5	7.8	8.0	8.3	22.4	22.2	22.8	8.0	8.0	8.1	240	240	240
Control C	57	5	5	5	7.8	8.1	8.3	22.3	22.0	22.4	8.1	8.0	8.1	240	240	245
Control D	1506	5	5	5	7.8	8.1	8.3	22.3	22.0	22.9	8.1	8.0	8.1	240	240	245
100% A	58	5	5	5	7.4	7.8	8.1	22.3	22.3	22.7	5.8	7.1	8.0	365	365	370
100% B	414	5	5	5	7.4	7.8	8.1	22.2	22.2	22.6	5.7	7.1	7.9	365	365	370
100% C	503	5	5	5	7.4	7.8	8.1	22.1	22.1	22.5	5.6	7.2	7.9	365	365	370
100% D	553	5	5	5	7.4	7.8	8.1	22.0	22.0	22.6	5.6	7.2	7.9	365	365	375
Measured/Loaded by:		MF	MF	MF	MC	TR	JN	MC	TR	JN	MC	TR	JN	MC	TR	JN
Recorded by:		MF	MF	MF	MC	CH	CL	MC	CH	DL	MC	CH	DL	MC	CH	DL

Investigators' Signatures

Marshall Faircloth
[illegible]
Joseph Martin
John G. Rieder
David F. Rees

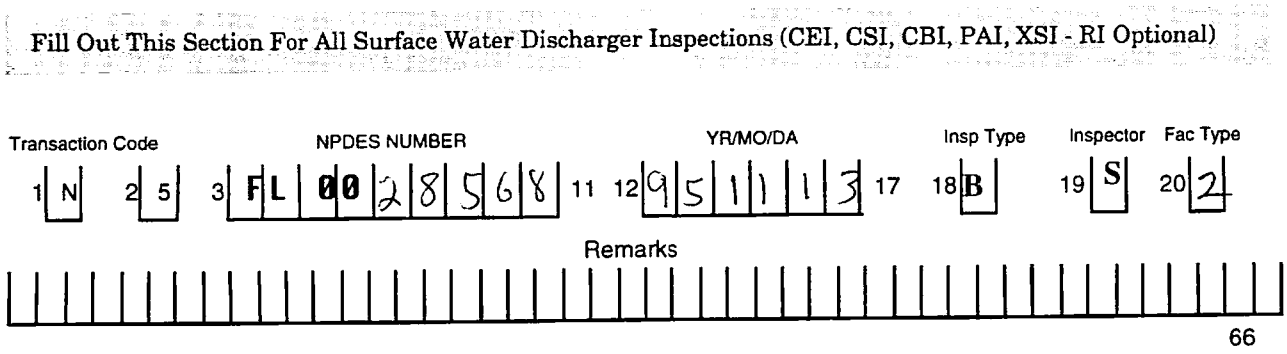
reviewer

form updated 5/05/95

Water Quality Parameters	Salt Water: (Well Water) / 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		[illegible]	—	Ruth Bowman
Lab Total Residual Cl2 (mg/L):	<0.03 / —	<0.03	DR 100	JN
Alkalinity (mg/L as $CaCO_3$):	125 / —	115	Hach	JN
Hardness (mg/L as $CaCO_3$):	125 / —	95	Hach	JN
Total ammonia (mg/L as N):	<0.017 / —	4.40	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.7 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of the Magnolia Springs Apartments effluent sampled on November 13, 1995, NPDES #FL0028568.



The Priority Pollutants Analysis for the Bioassay of the Magnolia Springs Apartments effluent sampled on November 13, 1995, NPDES #FL0028568.

