

Bioassays of

City of Lakeland - Larson Power Plant

Lakeland, Polk County, Florida

NPDES #FL0026298

Sampled 4/17/95

May 1995

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan #870346G

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City of Lakeland - Larson Power Plant

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Biology Section
Bureau of Laboratories
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Introduction

City of Lakeland - Larson Power Plant, Lakeland, Polk County, Florida, NPDES #FL0026298, tests performed on 18 to 20 April, 1995.

This electric-power generating plant is located at 501 East Lemon Street in Lakeland. Once-through condenser-cooling water is not treated prior to discharge to Lake Parker (facility summary provided by Lisa Carter, FDEP Tampa).

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 with 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 17 April, 1995, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Lakeland-Larson Power Plant Lakeland, Polk County, Florida, NPDES# FL0026298, performed on 18 to 20 April, 1995.

Facility:	City of Lakeland-Larson Power Plant		NPDES #	FL0026298	Facility Type: Power Plant
Location:	501 East Lemon Street, Lakeland		Contact/District:	L. Carter/Southeast	
County:	Polk		Test type:	static acute screen	
Sample Collection Date:	4/17/95	Time: 1100	# tests:	2	Receiving Water: Lake Parker
Test Beginning Date:	4/18/95	Time: 1530	Chlorination Type:	Not Chlorinated	
Test Ending Date:	4/20/95	Time: 1530			Page 1 of1

Total Residual CL2	mg/L	Method
Field:	-	-
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):	115	125
20% Dilute Mineral Water (cladocerans):	65	80
100% Sample:	50	65

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

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	8.0	-	8.2	24.2	-	24.2	7.9	-	8.0	170	195
Control B	0/20	5	5	5	-	-	8.2	-	-	24.0	-	-	8.1	-	195
Control C	0/20	5	5	5	-	-	8.2	-	-	24.0	-	-	8.2	-	195
Control D	0/20	5	5	5	-	-	8.2	-	-	24.0	-	-	8.3	-	190
100% A	20/0	5	5	5	7.8	-	8.3	23.7	-	24.0	7.8	-	8.4	180	205
100% B	20/0	5	5	5	-	-	8.3	-	-	24.0	-	-	8.4	-	200
100% C	20/0	5	5	5	-	-	8.3	-	-	24.0	-	-	8.6	-	200
100% D	20/0	5	5	5	-	-	8.3	-	-	24.1	-	-	8.7	-	195

[A] Temperature of the test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 23.9-24.4°C.

Organism: *Cyprinella leedsi* Age: 10 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	7.9	8.2	8.3	24.5	24.6	23.9	8.0	7.7	8.1	250	245
Control B	0/500	5	5	5	7.9	8.2	8.3	-	-	23.8	8.0	7.8	8.1	250	245
Control C	0/500	5	5	5	7.9	8.2	8.3	-	-	23.7	8.0	7.8	8.2	250	250
Control D	0/500	5	5	5	7.9	8.2	8.3	-	-	23.6	8.0	7.8	8.2	250	250
100% A	500/0	5	5	5	7.7	7.7	7.7	23.3	24.5	23.7	7.8	7.6	8.2	185	190
100% B	500/0	5	5	5	7.7	7.7	7.7	-	-	23.6	7.7	7.5	8.0	185	190
100% C	500/0	5	5	5	7.7	7.7	7.7	-	-	23.5	7.7	7.5	8.0	185	190
100% D	500/0	5	5	5	7.7	7.7	7.7	-	-	23.4	7.9	7.5	8.0	185	190

[B] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 25.5-26.5°C.

Table 2. Results of chemical analyses on the effluent from the City of Lakeland-Larson Power Plant sampled on April 17, 1995.

Metals

Aluminum	290	µg/L
Calcium	19.7	mg/L
Copper	12	µg/L
Iron	189	µg/L
Magnesium	2.97	mg/L
Zinc	13	µg/L [I]

Base, Neutral, & Acid Extractable Organic Compounds

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: City of Lakeland Larson Plant
County: POLK
Contact / District: Lisa Carter / SW
NPDES Permit #: FL0026298
LIMS Sample #: i04047 LIMS Job #: 95-APR-18-33-01
Entered by 4/24/95

Sample Collection: Date 4-17-95 Time 1100
Test Beginning: Date 4-18-95 Time 1530
Test Ending: Date 4-20-95 Time 1530
Organism Batch #: 22 Diluent Batch #: 16
Organism Age: < 24hrs
Test Organism: Ceriodaphnia 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	23.9 @ 23.8	8.2 @ 25.1 °C	110.0 @ 98.6 970 @ 990 @ 24.5 °C 10280 10175
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.5 @ 24.3	8.2 @ 24.9 °C	110.1 @ 98.6 970 @ 990 @ 24.5 °C 10280 10175
48 hr	7.0 @ 7.0 10.0 @ 10.0	23.3 @ 23.4	8.3 @ 24.5 °C	109.0 @ 98.6 978 @ 990 @ 24.4 °C 10280 @ 10175

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	24 h	48 h
Control	A	5	5	5	8.0		8.2	24.2		24.2	7.9		8.0	170		195
Control	B	5	5	5			8.2			24.0			8.1			195
Control	C	5	5	5			8.2			24.0			8.2			195
Control	D	5	5	5			8.2			24.0			8.3			190
100%	A	5	5	5	7.8		8.3	23.7		24.0	7.8		8.4	180		205
100%	B	5	5	5			8.3			24.0			8.4			200
100%	C	5	5	5			8.3			24.0			8.6			200
100%	D	5	5	5			8.3			24.1			8.7			195
Recorded by:		TR	TR	MF	JN		JN	JN		JN	JN		JN	JN		JN
Measured/Loaded by:		TR	MF	MF	MF		LW	MF		LW	MF		LW	MF		LW

Investigators' Signatures

Reviewer

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			not measured		
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR-100	TR
Alkalinity (mg/L as $CaCO_3$):	—	65	50	Hach	JRS
Hardness (mg/L as $CaCO_3$):	—	80	65	Hach	JRS
Total ammonia (mg/L as N):	—	<0.017	<0.017	orion	MF

Ammonia Meter #98136 Meter Slope: -56.7
Ammonia Blank: <0.017
Control Salinity: 0 ppt
Sample Salinity: 0 ppt

form updated 10/05/94

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Lakeland Larson Plant
County: Polk
Contact / District: Lisa Carter / Southwest
NPDES Permit #: FL0026298
LIMS Sample #: 104247 (sample log 4/16/95) LIMS Job #: 95-APR-18-33

Sample Collection: Date 4-17-95 Time 1100
Test Beginning: Date 4-18-95 Time 1530
Test Ending: Date 4/20/95 Time 1530
Organism Batch #: 15 Diluent Batch #: well
Organism Age: 10 days
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	23.9 @ 23.8	8.2 @ 25.1 °C	110.0 @ 98.6 970 @ 990 @ 24.5 °C (10280 / 10175)
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.5 @ 24.3	8.2 @ 24.9 °C	970 @ 990 110.7 @ 98.6 @ 24.8 °C (10280 / 10175)
48 hr	7.0 @ 7.0 10.0 @ 10.0	23.3 @ 23.4	8.3 @ 24.5 °C	109.0 @ 98.6 978 @ 990 @ 24.4 °C (10280 / 10175)

		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	77	5	5	5	7.9	8.2	8.3	24.5	24.6	23.9	8.0	7.7	8.1	250	250	245
Control B	19	5	5	5	7.9	8.2	8.3			23.8	8.0	7.8	8.1	250	250	245
Control C	198	5	5	5	7.9	8.2	8.3			23.7	8.0	7.8	8.2	250	250	250
Control D	4	5	5	5	7.9	8.2	8.3			23.6	8.0	7.8	8.2	250	255	250
100% A	25	5	5	5	7.7	7.7	7.7	23.3	24.5	23.7	7.8	7.6	8.2	185	190	190
100% B	48	5	5	5	7.7	7.7	7.7			23.6	7.7	7.5	8.0	185	190	190
100% C	9	5	5	5	7.7	7.7	7.7			23.5	7.7	7.5	8.0	185	190	190
100% D	883	5	5	5	7.7	7.7	7.7			23.4	7.9	7.5	8.0	185	190	190
Recorded by:		TR	TR	LW	JN	TR	JN	JN	TR	JN	JN	TR	JN	JN	TR	JN
Measured/Loaded by:		TR	TR	LW	MF	MF	LW	MF	MF	LW	MF	MF	LW	MF	MF	LW

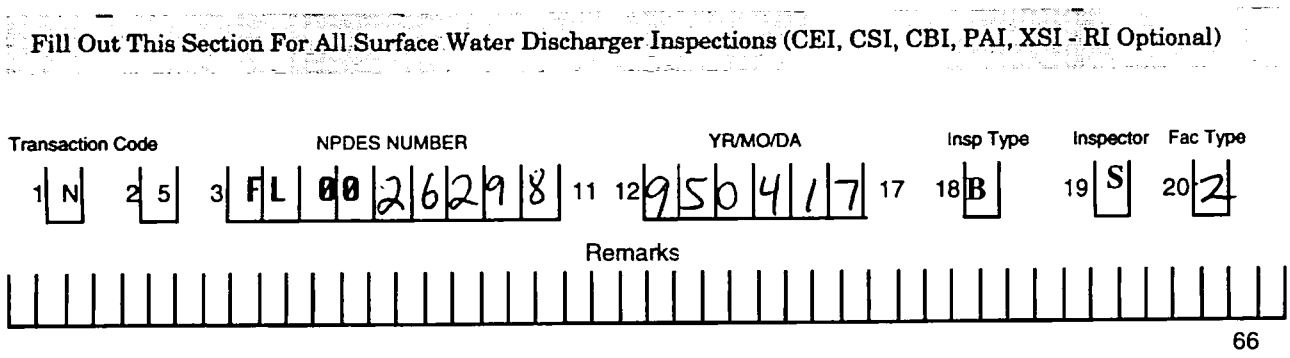
Investigators' Signatures
Marshall Faircloth
John C. Rader
Jennifer Spraggins
Reviewer

Water Quality Parameters	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			Not measured		
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DR-100	TR
Alkalinity (mg/L as $CaCO_3$):	115	—	50	Hach	JRS
Hardness (mg/L as $CaCO_3$):	125	—	65	Hach	JRS
Total ammonia (mg/L as N):	<0.017		<0.017	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -56.7 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

form updated 10/05/94

The Bioassay of the City of Lakeland-Larson Power Plant effluent sampled on April 17, 1995, NPDES # FL0026298.



The Priority Pollutants Analysis for the Bioassay of the City of Lakeland-Larson Power Plant effluent sampled on April 17, 1995, NPDES # FL0026298.

