

Bioassays of

Florida Power & Light – Fort Lauderdale Plant

Fort Lauderdale, Broward County, Florida

NPDES #FL0001503

Sampled 4/22/02

October 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

Bioassays of

Florida Power & Light – Fort Lauderdale Plant

Fort Lauderdale, Broward County, Florida

NPDES #FL0001503

Biology Section
Bureau of Laboratories
October 2002

Introduction

Florida Power and Light Company-Fort Lauderdale Plant, 4300 42nd Street, Fort Lauderdale, Broward County, Florida, NPDES #FL0001503, tests performed on 23 to 25 April 2002.

This natural gas-fired electric power generating facility has a total generating capacity of 860 megawatts. The facility's wastewater system has a design flow of 363 MGD and an annual average flow of 303 MGD (January, 2001-December, 2002). Effluent consisting of untreated once-through cooling water is discharged into the Class III marine waters of the South Fork New River (facility information provided by Stanley Ganthier, FDEP, West Palm Beach).

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 this facility using the mysid shrimp, *Americamysis bahia*, and the inland silverside minnow, *Menidia beryllina.* The salinity of the sample was approximately 20 parts per thousand (ppt). The control water was natural seawater (NSW) diluted to the test salinity. The test results did not show toxicity to either test species within 48 hours (Table 1).

Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. Total ammonia in the sample preserved for chemical analysis was 0.028 mg/L. Further chemical analyses were performed on effluent samples for base-, neutral-, and acid-extractible organic compounds, metals, nutrients, and pesticides. Several metals, nutrients, and the herbicide, atrazine, were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on April 22, 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 Florida Power and Light Company-Fort Lauderdale Plant, 4300 SW 42nd Street, Fort Lauderdale, Broward County, Florida, NPDES# FL0001503 performed from 23 to 25 April 2002.

Facility:	**Florida Power and Light- Ft. Lauderdale**	**NPDES #**	**FL0001503**	Facility Type:	**Electric Power**	**Analysts:**	Della Parker-Hanson
Location:	4300 42nd St., Ft. Lauderdale	Contact/District:	T. Davis/Southeast		**Generating Plant**		Joshua Ayres
County:	Broward	Test type:	static acute screen				Marshall Faircloth
Sample Collection Date:	4/22/2002 Time: 1130	# tests:	2	Receiving Water:	South Fork New River		Jacquelyn Brynda
Test Beginning Date:	4/23/2002 Time: 1300	Chlorination Type:	non-chlorinated	Classification:	Class III Marine		Gary Hardee
Test Ending Date:	4/25/2002 Time: 1400				**Page 1 of 1**	**Reviewer:**	David Whiting

Organism: ***Americamysis bahia*** Life stage: 1 day

	Sample/Diluent	SURVIVAL # Alive			pH			TemperatureA			Dissolved Oxygen			Conductivity Uncorrected mmhos/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	8.0	8.2	24.3	24.7	27.0	6.4	6.0	6.3	30.5	32.4
Control B	0/500	5	5	5	7.9	8.0	8.1	24.3	24.2	25.2	6.6	6.2	6.3	31.3	32.8
Control C	0/500	5	5	5	7.9	8.0	8.1	24.3	24.1	25.9	6.7	6.4	6.2	31.3	34.0
Cotnrol D	0/500	5	5	5	7.9	8.0	8.2	24.2	24.6	24.8	6.7	6.2	6.7	31.4	33.7
100% A	500/0	5	5	5	7.9	8.1	8.2	24.7	24.8	26.3	6.2	6.1	6.3	31.4	34.4
100% B	500/0	5	3	3	7.9	8.1	8.2	24.6	24.4	25.1	6.2	6.1	6.4	31.5	33.3
100 % C	500/0	5	4	4	7.9	8.1	8.2	24.5	24.4	25.2	6.2	6.2	6.4	31.6	34.4
100% D	500/0	5	5	5	7.9	8.1	8.2	24.5	24.3	25.1	6.2	6.2	6.5	31.5	33.6

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

Organism: ***Menidia beryllina*** Life stage: 10 days

	Sample/Diluent	SURVIVAL # Alive			pH			TemperatureB			Dissolved Oxygen			Conductivity Uncorrected mmhos/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	8.1	8.1	24.4	24.0	25.6	6.9	6.7	6.3	30.3	30.6
Control B	0/500	5	5	5	7.9	8.1	8.1	24.5	24.8	25.4	6.8	6.7	6.3	29.7	33.2
Control C	0/500	5	5	5	7.9	8.1	8.1	24.5	24.6	24.8	6.7	6.5	6.3	31.5	34.3
Cotnrol D	0/500	5	5	5	7.9	8.1	8.1	24.5	25.1	24.9	6.7	6.6	6.3	31.3	33.7
100% A	500/0	5	5	5	7.9	8.2	8.1	24.9	24.6	25.5	6.4	6.6	5.2	32.0	33.7
100% B	500/0	5	5	5	7.9	8.2	8.2	25.1	24.9	25.3	6.3	6.7	6.0	32.0	34.1
100 % C	500/0	5	5	5	7.9	8.2	8.2	25.1	24.5	24.7	6.1	6.5	6.1	32.0	33.4
100% D	500/0	5	5	5	7.9	8.2	8.1	25.1	24.5	24.8	6.1	6.6	6.2	32.0	33.4

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

LIMS	
Job number:	TLH-2002-04-23-06
sample number:	589418

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

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
NSW	<0.051	<0.051
100% Sample:	<0.034	<0.034

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
NSW	221	-
100% Sample:	181	-

Salinity [C]	ppt
NSW	~20 diluted from 33 ppt
100% Sample	~20

[C] Salinity based on conductivity and temperature.

Table 2. Results of chemical analyses on the effluent from the Florida Power and Light Company-Fort Lauderdale Plant sampled on April 22, 2002.

Metals

Aluminum	55	µg/L	I
Calcium	302	mg/L	
Copper	8.2	µg/L	AJ
Iron	31	µg/L	I
Magnesium	981	mg/L	

Nutrients

Ammonia	0.028	mg N/L	
Nitrite+Nitrate	0.027	mg N/L	
Total Kjeldahl Nitrogen	0.78	mg N/L	
Orthophosphate	0.016	mg P/L	Q
Total Phosphorus	0.059	mg P/L	

Pesticides and Herbicides

Atrazine	0.074	µg/L	I

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.
[Q] Sample held beyond normal holding time.

The Bioassay of the Florida Power and Light Company-Fort Lauderdale Plant effluent sampled on April 22, 2002, NPDES #FL0001503.

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 0 1 5 0 3 # #		0 2 0 4 2 2		# **B**	# **S**	# 2

Remarks

#

The Priority Pollutants Analysis for the Bioassay of the Florida Power and Light Company-Fort Lauderdale Plant effluent sampled on April 22, 2002, NPDES #FL0001503.

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 0 1 5 0 3 # #		0 2 0 4 2 2		# **X**	# **S**	# 2

Remarks

#