Bioassays of

Florida Power & Light
Port Everglades Power Plant

Port Everglades, Broward County, Florida

NPDES #FL0001538

Sampled 06/07/95

July 1995

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

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Introduction

Florida Power and Light Company, Port Everglades Power Plant, Port Everglades, Broward County, Florida, NPDES #FL0001538, tests performed on 8 to 10 June, 1995.

This steam electric power plant is located at 8100 Eisenhower Boulevard in Port Everglades. Approximately 1.2 BGD of once through cooling water, auxiliary equipment cooling water, and stormwater overflow from the B-5 basin and the East fuel-oil tank farm is discharged to Lake Worth (Intracoastal Waterway). Chlorine is periodically injected into the cooling water system to control bio-fouling. Effluent is discharged to the Intracoastal Waterway via a discharge canal (facility summary from FDEP NPDES files, Tallahassee).

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 bioassays on a sample of effluent from this facility. The salinity of the sample was 33.6 ppt, therefore, the test species used for these bioassays were the mysid shrimp, *Mysidopsis bahia*, and the inland silverside, *Menidia beryllina*. Control water for the tests was prepared with an artificial sea salt mixture (Forty Fathoms®) and well water to approximate the salinity of the effluent as collected. 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 7 June, 1995, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the FPL-Port Everglades Power Plant Port Everglades, Broward County, Florida, NPDES# FL0001538, performed on 8 to 10 June, 1995.

Facility:	**FPL-Port Everglades Power Plant**		**NPDES #**	**FL0001538**	Facility Type: **Power Plant**
Location:	8100 Eisenhower Blvd., Port Everglades		Contact/District:	T. Davis/Southeast	
County:	Broward		Test type:	static acute screen	
Sample Collection Date:	**6/7/95**	Time: 1500	# tests:	2	Receiving Water: Intracoastal Waterway
Test Beginning Date:	6/8/95	Time: 1400	Chlorination Type:	**Chlorinated***	
Test Ending Date:	6/10/95	Time: 1400	*Intermittant addition of chlorine for bio-fouling control		**Page 1 of 1**

Organism: ***Mysidopsis bahia*** Life stage: 3-4 days

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 mmhos/cm 0 hour	48 hour
Control A	0/500	5	5	5	8.0	8.0	8.0	24.1	23.6	24.0	7.0	6.3	6.4	51.7	52.2
Control B	0/500	5	5	5	8.0	8.0	8.0	24.1	-	24.0	7.0	6.4	6.2	51.5	52.0
Control C	0/500	5	5	5	8.0	8.0	8.0	24.0	-	24.0	7.0	6.5	6.1	51.6	52.2
Control D	0/500	5	5	5	8.0	8.0	8.0	23.9	-	24.0	7.2	6.5	6.1	51.5	52.2
100% A	500/0	5	5	5	8.2	8.1	8.1	24.0	23.5	24.1	7.2	6.5	6.3	50.3	50.9
100% B	500/0	5	5	5	8.2	8.1	8.1	24.0	-	24.0	7.2	6.5	6.0	50.2	50.6
100% C	500/0	5	5	5	8.2	8.1	8.1	24.0	-	23.9	7.4	6.6	5.8	50.2	50.5
100% D	500/0	5	5	5	8.2	8.1	8.1	24.0	-	23.8	7.5	6.6	5.7	50.2	50.5

[A] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 24.2-24.5°C.

Organism: ***Menidia beryllina*** Age: 6 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 mmhos/cm 0 hour	48 hour
Control A	0/500	5	5	5	7.9	8.0	8.1	24.2	23.6	23.9	7.1	6.6	6.5	51.8	52.2
Control B	0/500	5	5	5	7.9	8.0	8.1	24.2	-	23.9	7.1	6.6	6.6	51.6	52.1
Control C	0/500	5	5	5	7.9	8.0	8.1	24.2	-	24.0	7.1	6.8	6.6	51.6	52.2
Control D	0/500	5	5	5	7.9	8.0	8.1	24.1	-	24.0	7.2	6.8	6.6	51.7	52.1
100% A	500/0	5	5	5	8.2	8.1	8.1	24.2	23.6	23.9	7.3	6.8	6.4	50.4	50.8
100% B	500/0	5	5	5	8.2	8.1	8.1	24.2	-	23.9	7.4	6.8	6.4	50.4	50.8
100% C	500/0	5	4	4	8.2	8.1	8.1	24.2	-	24.0	7.4	6.9	6.5	50.4	50.8
100% D	500/0	5	5	5	8.2	8.1	8.1	24.1	-	24.0	7.4	6.9	6.5	50.3	50.8

[B] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 24.2-24.5°C.

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

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water:	< 0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water:	100	-
100% Sample:	125	-

Salinity*	(ppt)
Control Water:	34.0
100% Sample:	33.6

*Salinity converted from conductivity/temperature measurements.

Table 2. Results of chemical analyses on the effluent from the FPL-Port Everglades Power Plant sampled on June 7, 1995.

Metals

Calcium	400	mg/L
Chromium	50	µg/L [I]
Iron	120	µg/L [J]
Magnesium	1240	mg/L [A]
Nickel	20	µg/L [I]

Pesticides

none detected

Base, Neutral, and Acid-Extractable Organics

none detected

[A] Value reported is the mean of two or more determinations.
[I] Value reported is less than the minimum quantitation limit, and greater than or equal to the minimum detection limit.
[J] Estimated value.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: FPL Port Everglades ~~WWTP~~ Plant
County: ~~Ft. Lau~~ Broward
Contact/District: T. Davis / SouthEast Port St. Lucie
NPDES Permit #: FL0001538
LIMS Sample #: 107697 LIMS Job #: 95-Jun-08-05

Sample Collection: Date 6/7/95 Time 1500
Test Beginning: Date 6/8/95 Time 1400
Test Ending: Date 6/10/95 Time 1400
Organism Batch #: 155+156 Diluent Batch #: 23
Organism Age: 3-4 days old
Test Organism: Mysidopsis bahia

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	24.8 @ 24.9	8.3 @ 24.1 °C	1060 @ 1000 1007 @ 1001 @ 24.8 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.0 @ 26.2 °C	493 & 49.5 mmhos on 1011 @ 1000 498 @ 49.5 @ 24.6 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.1	8.4 @ 24.2 °C	998 @ 1001 µmhos mmhos 49.1 @ 49.9 @ 24.6 °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) 0 hr	UNCORRECTED Cond. (mmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) 48 h
Control A	174	5	5	5	8.0	8.0	8.0	24.1	23.6	24.0	7.0	6.3	6.4	51.7	51.4	52.2
Control B	65	5	5	5	8.0	8.0	8.0	24.1		24.0	7.0	6.4	6.2	51.5	51.1	52.0
Control C	366	5	5	5	8.0	8.0	8.0	24.0		24.0	7.0	6.5	6.1	51.6	51.3	52.2
Control D	87	5	5	5	8.0	8.0	8.0	23.9		24.0	7.2	6.5	6.1	51.5	51.7	52.2
100% A	610	5	5	5	8.2	8.1	8.1	24.0	23.5	24.1	7.2	6.5	6.3	50.3	50.1	52.0 *
100% B	618	5	5	5	8.2	8.1	8.1	24.0		24.0	7.2	6.5	6.0	50.2	49.8	52.1 *
100% C	718	5	5	5	8.2	8.1	8.1	24.0		23.9	7.4	6.6	5.8	50.2	49.8	52.2 *
100% D	348	5	5	5	8.2	8.1	8.1	24.0		23.8	7.5	6.6	5.7	50.2	49.9	52.1 *
														100% A		50.9
														100% B		50.6
														100% C		50.5
														100% D		50.5
														* incorrect #'s recorded on 6/10/95		
Recorded by:		TM	MF	MF	JN	JN	MF	JN	JN	MF	JN	JN	MF	JN	JN	MF
Measured/Loaded by:		TM	MF	MF	JLS	MF	MF	JLS	MF	MF	JLS	MF	MF	JLS	MF	MF

Investigators' Signatures
Tom A. Rader Jennifer Sparapani
Marshall Faircloth
Tina Mikulski
Reviewer

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

Ammonia Meter #98136 Ammonia Meter Slope: -57.5 Ammonia Blank: <0.017 Control Salinity: 34.0 ppt Sample Salinity: 33.6 ppt

form updated 10/05/94

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: FPL Port Everglades Plant
County: Broward
Contact / District: T. Davis / SouthEast
NPDES Permit #: FL0001538
LIMS Sample #: 107697 **LIMS Job #:** 95-Jun-08-05

Sample Collection: Date 6/7/95 Time 1500
Test Beginning: Date 6/8/95 Time 1400
Test Ending: Date 6/10/95 Time 1400
Organism Batch #: 39 **Diluent Batch #:** 23
Organism Age: 6 days old
Test Organism: Menidia beryllina

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	24.8 @ 24.9	8.3 @ 24.1 °C	106.0 @ 100.0 umhos-cm 1007 @ 1001 @ 24.8 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.0 @ 26.2 °C	49.3 @ 49.5 mmhos-cm 1011 @ 1000 49.8 @ 49.5 @ 24.6 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.1	8.4 @ 24.2 °C	998 @ 1001 49.1 @ 49.9 @ 24.0 °C

Conc.	Chamber #	Number Live 0 hr	Number Live 24 hr	Number Live 48 hr	pH 0 hr	pH 24 hr	pH 48 hr	Temperature (°C) 0 hr	Temperature (°C) 24 hr	Temperature (°C) 48 hr	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 hr	D.O. (mg/L) 48 hr	UNCORRECTED Cond. (mmhos/cm) 0 hr	UNCORRECTED Cond. (mmhos/cm) 24 hr	UNCORRECTED Cond. (mmhos/cm) 48 hr
Control A	11	5	5	5	7.9	8.0	8.1	24.2	23.6	23.9	7.1	6.6	6.5	51.8	51.5	52.2
Control B	147	5	5	5	7.9	8.0	8.1	24.2		23.9	7.1	6.6	6.6	51.6	51.1	52.1
Control C	9	5	5	5	7.9	8.0	8.1	24.2		24.0	7.1	6.8	6.6	51.6	50.2	52.2
Control D	23	5	5	5	7.9	8.0	8.1	24.1		24.0	7.2	6.8	6.6	51.7	51.5	52.1
100% A	414	5	5	5	8.2	8.1	8.1	24.2	23.6	23.9	7.3	6.8	6.4	50.4	50.3	50.8
100% B	219	5	5	5	8.2	8.1	8.1	24.2		23.9	7.4	6.8	6.4	50.4	49.9	50.8
100% C	104	5	4	4	8.2	8.1	8.1	24.2		24.0	7.4	6.9	6.5	50.4	49.8	50.8
100% D	28	5	5	5	8.2	8.1	8.1	24.1		24.0	7.4	6.9	6.5	50.3	49.9	50.8
Recorded by:		TM	MF	MF	JN	JN	MF	JN	JN	MF	JN	JN	MF	JN	JN	MF
Measured/Loaded by:		MF	MV	MF	JLS	MF	MF	JLS	MF	MF	JLS	MF	MF	JLS	MF	MF

Investigators' Signatures
Robert A. Raden
Jennifer Sarapane
Marshall Faircloth
Joyce Smith
Tina Mikulasky
Reviewer

(Salt Water)

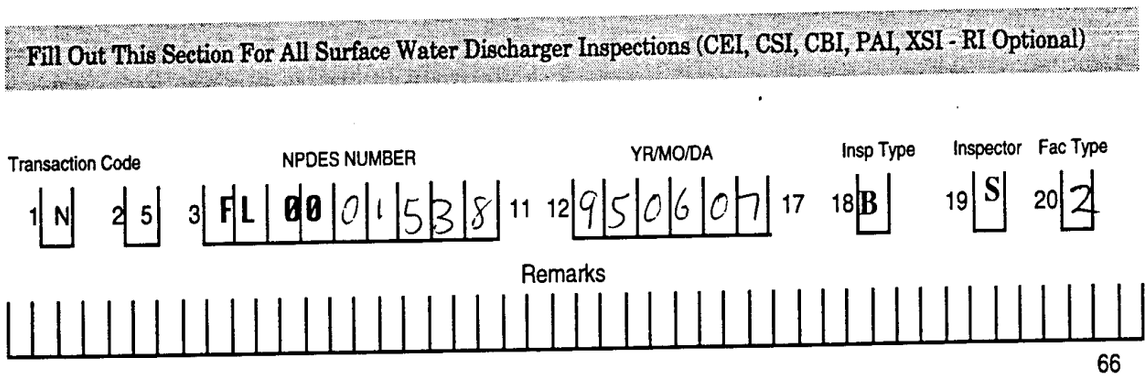
Water Quality Parameters

	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			—	—	—
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR-100	TR
Alkalinity (mg/L as $CaCO_3$):	100	—	125	Hach	TR
Hardness (mg/L as $CaCO_3$):	—	—	—	~~Hach~~	~~TR~~
Total ammonia (mg/L as N):	<0.017	—	<0.017	Orion	JN

Ammonia Meter #98136 Meter Slope: -57.5 Ammonia Blank: <0.017 Control Salinity: 34.0 ppt Sample Salinity: 33.6 ppt

form updated 10/05/94

The Bioassay of the FPL-Port Everglades Power Plant effluent sampled on June 7, 1995, NPDES #FL0001538.



The Priority Pollutants Analysis for the Bioassay of the FPL-Port Everglades Power Plant effluent sampled on June 7, 1995, NPDES #FL0001538.

