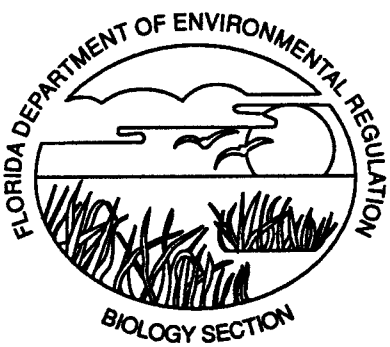
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Bioassays of

Town of Jupiter Reverse Osmosis Plant

Jupiter, Palm Beach County, Florida

NPDES #FL0042358

Sampled 8/26/91

October 22, 1991

Biology Section
Division of Technical Services

Bioassays of

Town of Jupiter Reverse Osmosis Plant

Jupiter, Palm Beach County, Florida

NPDES #FL0042358

Biology Section
Bureau of Laboratories
October 22, 1991

Introduction

Town of Jupiter Reverse Osmosis Plant, Palm Beach County, Florida, NPDES # FL0042358, on 27 to 29 August, 1991.

This facility utilizes a two-stage reverse osmosis process for the production of potable water for the Town of Jupiter. Daily production of 6 mgd of treated, potable water results in an average 1.5 mgd of process reject water. Discharge of reject water is to the C-18 Canal near the southwest fork of the Loxahatchee River. These waters are designated as Class II Waters in 17-302.600 (3)(c) 50, F.A.C.

The permittee is authorized a limited mixing zone for fluoride and combined radium $^{226+228}$. The mixing zone extends radially 1,000 feet into the C-18 Canal from the discharge pipe. The permittee is required to maintain the fluoride and radium water quality standards for Class II Surface Waters outside the permitted mixing zone. No mixing zone is granted for any other water quality standards.

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 FDER Biology Section performed a static acute screening toxicity bioassay on a sample of effluent from this facility. Due to the salinity of the sample (16.7 ppt), the bioassay organism used for the test was the mysid shrimp, *Mysidopsis bahia*. The test results indicated that the effluent was not toxic to the mysids.

Total residual chlorine and total ammonia were not detected in the sample. Further chemical analyses were performed on the sample for chloride and fluoride. The fluoride concentration was 4.6 mg /L. Class II water quality standards limit the fluoride concentration to ≤ 1.5 mg/L (at the edge of the mixing zone for this discharger). The chloride concentration of the effluent sample was estimated to be 9,000 mg/L. Chloride concentrations, at end-of-pipe, are limited to ≤ 10 % above the background level of the receiving waters.

Conclusion

The sample of effluent from this facility was not toxic on 26 August, 1991.

Table 1. Concentration Series and Volumes Used for the Static Acute Screening Bioassay of the Jupiter Reverse Osmosis plant on 27 to 29 August, 1991.

Mysidopsis bahia (mysid shrimp)

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

Table 2. Data recorded during the static acute screening bioassay of a sample of effluent from the Town of Jupiter Reverse Osmosis plant, Palm Beach County, Florida, NPDES# FL0042358, on 27 to 29 August, 1991.

Facility:	**Town of Jupiter R/O**	**NPDES #**	**FL0042358**	Facility Type:	**Reverse Osmosis**
Location:	Jupiter	Contact/District:	Ivan Pettit / SE		for potable water
County:	Palm Beach	Test type:	static acute screen		
Sample Collection Date:	**8/26/91** Time: 1105	# tests:	1	Receiving Water:	C-18 Canal, thence
Test Beginning Date:	8/27/91 Time: 1430	Chlorination Type:	**not chlorinated**		the Loxahatchee River
Test Ending Date:	8/29/91 Time: 1400				**Page 1 of 1**

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

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water :	0.00	0.00
100% Sample:	0.00	0.00

Organism: ***Mysidopsis bahia*** Life stage: < 4 days

LC50: > 100% Binomial: - Moving Average: - Probit: -

Salinity (ppt)	
Control Water:	20.0
100% Sample:	16.7

	SURVIVAL			pH			Temperature			Dissolved Oxygen			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	8.7	8.4	8.1	21.1	20.7	20.7	8.4	8.1	7.8	-	-
Control	5	5	5	8.7	8.4	8.1	-	-	-	8.4	8.1	7.8	29,500	29,900
100.0%	5	5	5	7.9	8.2	8.3	20.8	20.6	20.8	8.8	8.1	7.9	-	-
100.0%	5	5	5	7.9	8.2	8.3	-	-	-	8.8	8.2	7.9	24,800	25,600

Table 3. Results of chemical analyses on the sample of effluent from the Town of Jupiter Reverse Osmosis Plant, Palm Beach County, on 26 August, 1991.

Chloride	9,000	mg Cl / L [a]
Fluoride	4.6	mg F / L

a Value reported is the estimated value.

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DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Jupiter R/O
Address/City: Jupiter
County: Palm Beach
Contact/District: Ivan Rehrl / SE
NPDES Permit #: FL0042358 **Outfall #:**

Sample Collection: Date 8/26/91 Time 1105
Test Beginning: Date 8/27/91 Time 1430
Test Ending: Date 8/29/91 Time 1400
Test Organism: Mysidopsis Bahia
Life Stage/Age: 24 days

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

Remarks:
effluent salinity ≈ 16.7‰
control salinity ≈ 20.0‰

* one mysid on its side but very active when touched & XFer pipet

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.9 @ 7.0 9.0	8.9 @ 21.5	21.5 @ 24.2	1360 @ 24.2 / 1286
24 hr	7.9 @ 7.0 9.0	8.9 @ 21.5	21.2 @ 24.1	1374 @ 24.2 / 1286
48 hr	7.9 @ 7.0 9.0	8.9 @ 21.5	21.2 @ 23.8	1371 @ 23.9 / 1378

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	57	5	5	5	8.7	8.4	8.1	21.1	20.7	20.7	8.4	8.1	7.8			
Control	12	5	5	5	8.7	8.4	8.1				8.4	8.1	7.8	29500	29600	29500
100%	120	5	5	5	7.9	8.2	8.3	20.8	20.6	20.8	8.8	8.1	7.9			
100%	63	5	5	5*	7.9	8.2	8.3				8.8	8.2	7.9	24800	25200	25600
Measured/Loaded by:		MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		MF	MF	MF	AJ	MF	MF	AJ	MF	MF	AJ	MF	MF	AD	MF	MF

Investigators' Signatures
Alvaro Jordan
Marshall Faircloth
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:	Blank 0.0				
Lab Tot. Resid. Cl2:			0.0	HACH	AJ
Alkalinity:					
Hardness:					
Total Ammonia:	0.0	0.0	0.0	HACH	AJ

Ammonia Meter Slope: _____
Ammonia Blank: 0.0
Salinity Sample: 16.7 ppt