

Bioassays of

Fiesta Village Sewage Treatment Plant

Fort Myers, Lee County, Florida

NPDES #FL0039829

Sampled 3/2/92

April, 1992

Biology Section
Division of Technical Services

Bioassays of

Fiesta Village Sewage Treatment Plant

Fort Myers, Lee County, Florida

NPDES #FL0039829

Biology Section
Bureau of Laboratories
April, 1992

Introduction

Fiesta Village STP, Fort Myers, Lee County, Florida, NPDES #FL0039829, on 3 to 5 March, 1992.

This facility is located at 1366 San Souci Drive. It has an activated sludge process using extended aeration (oxidation ditch), chlorination, and dechlorination. The average daily flow of 1.60 MGD is partially discharged to the Caloosahatchee River via outfall 001 and partially reused for spray irrigation at two local golf courses.

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1991, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition (EPA/600/4-90/027).

Results and Discussion

The Biology Section performed static acute screening toxicity bioassays on a sample of effluent from this facility. A portion of the sample was dechlorinated with sodium thiosulfate in the laboratory. Static screening bioassays were also performed with the dechlorinated aliquots. The bioassay test species used for these tests were the waterflea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*. The test results indicated that neither the chlorinated nor dechlorinated samples were toxic to the test organisms.

The total residual chlorine concentration in the sample was 0.1 mg/L (Hach). The total and unionized ammonia concentrations in the sample were 2.04 mg/L (Hach) and 0.04 mg/L, respectively. Further chemical analyses detected the metals, aluminum (125 µg/L), cadmium (0.2[t] µg/L), copper (10 µg/L), and iron (98 µg/L). An equivocal determination was made of the pesticide Gamma-BHC (Lindane) (0.02 µg/L[q]). Organic compounds were not detected.

Conclusion

The sample of effluent from this facility was not toxic on 2 March, 1992.

[t]Value reported is less than the practical quantitation limit.
[q]Evidence that analyte was present in the sample is equivocal.

Table 1. Concentration Series and Volumes Used for the Static Acute Screening Bioassays of the Fiesta Village STP on 3 to 5 March, 1992.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20 mL	0 mL	20 mL
100%	0 mL	20 mL	20 mL

Notropis leedsi (bannerfin shiner)

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

Table 2. Results of chemical analyses on the sample of effluent from the Fiesta Village STP, Lee County, on 2 March, 1992.

Metals

Aluminum	125 µg/L
Cadmium	0.2 µg/L [t]
Copper	10 µg/L
Iron	98 µg/L
Zinc	trip blank contaminated

Pesticides

Gamma-BHC	0.02 µg/L [q]

t Value reported is less than the practical quantitation limit.
q Evidence that analyte was present in the sample is equivocal.

Table 3. Data recorded during the static acute screening bioassay of a dechlorinated sample of effluent from the Fiesta Village STP, Fort Myers, Lee County, Florida, NPDES# FL0039829, on 3 to 5 March, 1992.

Facility:	**Fiesta Village STP**	NPDES #	FL0039829	Facility Type:	**Sewage Treatment**
Location:	1366 San Souci Drive, Fort Myers	Contact/District:	A. Walton / South		
County:	Lee	Test type:	static screening		
Sample Collection Date:	3/2/92 Time: 1106	# tests:	2	Receiving Water:	Caloosahatchee River
Test Beginning Date:	3/3/92 Time: 1400	Chlorination Type:	**dechlorinated**		
Test Ending Date:	3/5/92 Time: 1400	Dechlor Method:	lab, sodium thiosulfate		**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Field:	not	measured
Lab:	0.1	Hach

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control Water (daphnids):	0.00	0.00
100% Sample:	2.04	0.04

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	135	130
Cond. Control Water (daphnids):	60	90
100% Sample:	115	225

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours
LC50: -

	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	8.3	-	8.1	22.0	-	25.0	8.7	-	8.3	154	198
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.3	-	-
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.3	-	-
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.3	-	-
100%	5	5	5	7.5	-	8.3	22.8	-	25.2	8.6	-	8.2	975	1073
100%	5	5	5	-	-	8.3	-	-	-	-	-	8.2	-	-
100%	5	5	5	-	-	8.3	-	-	-	-	-	8.2	-	-
100%	5	5	5	-	-	8.3	-	-	-	-	-	8.2	-	-

Organism: ***Notropis leedsi*** Age: 22 days
LC50: -

	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	7.9	8.0	8.3	22.1	22.3	23.2	8.6	8.4	8.3	-	-
Control	5	5	5	7.9	8.0	8.3	-	-	-	8.6	8.4	8.3	237	245
100%	5	5	5	7.4	7.8	8.1	23.1	22.3	23.0	8.8	8.5	8.2	-	-
100%	5	5	5	7.4	7.8	8.1	-	-	-	8.8	8.5	8.2	1081	1097

Table 4. Data recorded during the static acute screening bioassay of a chlorinated sample of effluent from the Fiesta Village STP, Fort Meyers, Lee County, Florida, NPDES# FL0039829, on 3 to 5 March, 1992.

Facility:	**Fiesta Village STP**		NPDES #	FL0039829	Facility Type: **Sewage Treatment**
Location:	1366 San Soud Drive, Fort Myers		Contact/District:	A. Walton / South	
County:	Lee		Test type:	static screening	
Sample Collection Date:	3/2/92	Time: 1106	# tests:	2	Receiving Water: Caloosahatchee River
Test Beginning Date:	3/3/92	Time: 1400	Chlorination Type:	**chlorinated**	
Test Ending Date:	3/5/92	Time: 1400	Dechlor Method:	plant dechlorination unit	**Page 1 of 1**

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours
LC50: -

	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	8.3	-	8.1	22.0	-	25.0	8.7	-	8.2	154	198
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.2	-	-
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.2	-	-
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.2	-	-
100%	5	5	5	7.4	-	8.3	22.8	-	24.9	8.6	-	8.4	1025	1125
100%	5	5	5	-	-	8.3	-	-	-	-	-	8.4	-	-
100%	5	5	5	-	-	8.3	-	-	-	-	-	8.4	-	-
100%	5	5	5	-	-	8.3	-	-	-	-	-	8.4	-	-

Organism: ***Notropis leedsi*** Age: 22 days
LC50: -

	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	7.9	8.0	8.3	22.1	22.3	23.2	8.6	8.4	8.3	-	-
Control	5	5	5	7.9	8.0	8.3	-	-	-	8.6	8.4	8.3	237	245
100%	5	5	5	7.3	7.8	8.1	23.4	22.3	23.1	8.9	8.7	8.2	-	-
100%	5	5	5	7.3	7.8	8.1	-	-	-	9.0	8.7	8.2	1085	1103

Total Residual Cl2	mg/l	Method
Field:	not	measured
Lab:	0.1	Hach

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control Water (daphnids):	0.00	0.00
100% Sample:	2.04	0.04

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	135	130
Cond. Control Water (daphnids):	60	90
100% Sample:	115	225

SEA Biology Section — Acute Bioassay Bench Sheet

Sample Source: Fiesta Village STP
Address/City:
County: Lee
Contact/District: Albert Walton / 5
NPDES Permit #: FL0039829 Outfall #:

Sample Collection: Date 3/3/92 Time 1106
Test Beginning: Date 3/3/92 Time 1400
Test Ending: Date 3/5/92 Time 1400
Test Organism: Ceriodaphnia dubia
Life Stage/Age: <24 hours

Test Number: 1 of 4 Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

92-MAR-03-01 29890

Remarks:

dec 1 - test

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.8, 7.9, 8.9	8.5 @ 24°C	23.2 @ 23.2	1363 @ 1360 @ 1368
24 hr	7.8, 7.10, 8.10	8.6 @ 23.5°C	23.2 @ 23.5	1368 @ 1370 @ 1377
48 hr	7.7, 10, 10	8.5 @ 24°C	23.2 @ 23.7°C	1373 @ 1376 @ 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	A	5	5	5	8.3		8.1	22.0		25.0	8.7		8.3	154		198
Control	B	5	5	5			8.1						8.3			
Control	C	5	5	5			8.1						8.3			
Control	D	5	5	5			8.1						8.3			
100%	A	5	5	5	7.5		8.3	22.8		25.2	8.6		8.2	975		1073
100%	B	5	5	5			8.3						8.2			
100%	C	5	5	5			8.3						8.2			
100%	D	5	5	5			8.3						8.2			
Measured/Loaded by:		MF	MK	MF	AJ		MF	AJ		MF	AJ		MF	AJ		MF
Recorded by:		AJ	MK	MF	AJ		AJ	AJ		AJ	AJ		AJ	AJ		AJ

dec 1 -

Investigators' Signatures

Marshall Faircloth
Alison Jordie

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			Not measured		
Lab Tot. Resid. Cl2:	0.0	0.0	0.9	Hach	MF
Alkalinity:	135	60	115	Hach	AJ
Hardness:	130	90	225	Hach	AJ
Total Ammonia:	0.10	0.0	2.04	Hach	AJ

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

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Fiesta Village STP
Address/City:
County: Lee
Contact/District: Albert Walton / S
NPDES Permit #: FL0039829 Outfall #:

Sample Collection: Date 3/2/92 Time 1106
Test Beginning: Date 3/3/92 Time 1400
Test Ending: Date 3/5/92 Time 1400
Test Organism: ~~Mysidopsis bahia~~ C dubia
Life Stage/Age: ~~2 days~~ <24 hrs

Test Number: 2 of 4 Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

92-MAR-03-01 29890

Remarks: Cl- test

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.7@9	8.5@24°C	23.2°C@23.2°C	1363@1366@1368
24 hr	7.7@10@10	8.6@23.5°C	23.2@23.5°C	1368@1367@1372
48 hr	7.7@10@10	8.5@24°C	23.7@23.7°C	1373@1379@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	A	5	5	5	8.3		8.1	22.0		25.2	8.7		8.2	154	198	198
Control	B	5	5	5			8.1						8.2			
Control	C	5	5	5			8.1						8.2			
Control	D	5	5	5			8.1						8.2			
100%	A	5	5	5	7.4		8.3	22.8		24.9	8.6		8.4	1025		1125
100%	B	5	5	5			8.3						8.4			
100%	C	5	5	5			8.3						8.4			
100%	D	5	5	5			8.3						8.4			
Measured/Loaded by:		MF	MF	MF	AJ		MF	AJ		MF	AJ		MF	HJ		MF
Recorded by:		AJ	AJ	MF	AJ		AJ	AJ		AJ	AJ		AJ	AJ		AJ

Cl-1

Investigators' Signatures

Marshall Faircloth
Alison Jordan

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			not measured		
Lab Tot. Resid. Cl2:	0.0	0.0	0.1	Hach	MF
Alkalinity:	135	60	115	Hach	AJ
Hardness:	130	90	225	Hach	AJ
Total Ammonia:	0.0	0.0	2.0	Hach	AJ

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

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Fiesta Village STP
Address/City: _____
County: Lee
Contact/District: Albert Walton/S
NPDES Permit #: FL0039829 Outfall #: _____

Sample Collection: Date 3/2/92 Time 1106
Test Beginning: Date 3/3/92 Time 1400
Test Ending: Date 3/5/92 Time 1400
Test Organism: N. reedai
Life Stage/Age: 22 days

Test Number: 3 of 4 Test Type: ~~Screening~~ | Definitive
(Static) | Static Renewal | Flow-through

92-MAR-03-01 24890

Remarks: decl-

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7, 10@10	8.5@24°C	23.2@23.2	1363@23.6@
24 hr	7@7/10@10	8.6@24.5°C	23.2@23.5	1368@23.3 1364@
48 hr	7@7, 10@10	8.5@24.0°C	23.6@23.7	1373@23.8@1378 1372

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	63	5	5	5	7.9	8.0	8.3	22.1	23.3	23.2	8.6	8.4	8.3			
Control	77	5	5	5	7.9	8.0	8.3				8.6	8.4	8.3	237	239	245
100%	13	5	5	5	7.4	7.8	8.1	23.1	23.3	23.0	8.7	8.5	8.2			
100%	57	5	5	5	7.4	7.8	8.1				8.8	8.5	8.2	1081	1095	1097
Measured/Loaded by:		MA	AJ	MF	AJ	MF	MF	AJ	MF	MF	AJ	MF	MF	AJ	MF	MF
Recorded by:		AJ	AJ	MF	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ

Investigators' Signatures

Reason for
Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			not measured		
Lab Tot. Resid. Cl2:	0.0	0.0	0.1	Hach	MF
Alkalinity:	135	60	115	Hach	AJ
Hardness:	130	90	125	Hach	AJ
Total Ammonia:	0.0	0.0	2.04	Hach	AJ

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

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Fiesta Village STP
Address/City: _____
County: Lee
Contact/District: Albert Walton/S
NPDES Permit #: FL0039829 Outfall #: _____

Sample Collection: Date 3/2/92 Time 1106
Test Beginning: Date 3/3/92 Time 1400
Test Ending: Date 3/5/92 Time 1410
Test Organism: N cedai
Life Stage/Age: 22 days

Test Number: 4 of 4 Test Type: (Screening) | Definitive
(Static) Static Renewal | Flow-through

92-MAR-03-01 29890

Remarks: Cl- test

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.0 10 10	8.5 @ 24.0°C	23.2 @ 23.2	1363 @ 23.6 @ 1368
24 hr	7.0 7.10 @ 10	8.6 @ 23.5°C	23.2 @ 23.5	1368 @ 23.7 @ 1372
48 hr	7.0 7.10 @ 10	8.5 @ 24°C	23.7 @ 23.7°C	1373 @ 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	63	5	5	5	7.9	8.0	8.3	23.1	23.3	23.2	8.0	8.4	8.3			
Control	77	5	5	5	7.9	8.0	8.3				8.6	8.4	8.3	237	239	245
100%	1	5	5	5	7.3	7.8	8.1	23.4	23.3	23.1	8.9	8.7	8.2			
100%	32	5	5	5	7.3	7.8	8.1				9.0	8.7	8.2	1095	1078	1103
Measured/Loaded by:		MF	AJ	MF	AJ	MF	MF	AJ	MF	MF	AJ	MF	MF	AJ	MF	MF
Recorded by:		AJ	AJ	MF	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ

C-1

Investigators' Signatures

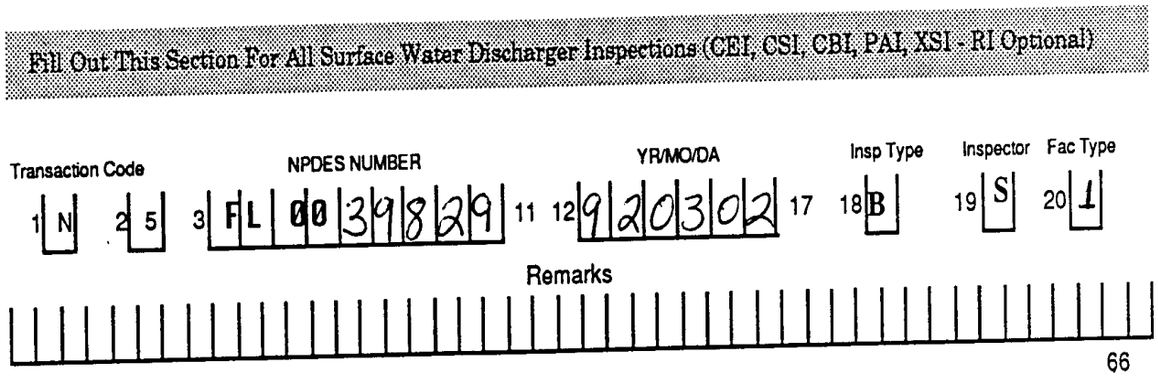
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			no-1	measured	
Lab Tot. Resid. Cl2:	0.0	0.0	0.1	Hach	MF
Alkalinity:	135	60	115	Hach	AJ
Hardness:	130	90	225	Hach	AJ
Total Ammonia:	0.0	0.0	2.04	Hach	AJ

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

The Bioassay of the Fiesta Village STP, NPDES# FL0039829, effluent sampled on March 2, 1992.



The Priority Pollutants Analysis for the Bioassay of the Fiesta Village STP, NPDES# FL0039829, effluent sampled on March 2, 1992.

