Bioassays of

Singing Surf and Picnickers Campground Sewage Treatment Plant

Beverly Beach, Flagler County, Florida

NPDES #FL0039519

Sampled 1/21/92

February 11, 1992

Biology Section
Division of Technical Services

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Introduction

Singing Surf and Picnickers Campground STP, Flagler County, Florida, NPDES #FL0039519, on 22 to 23 January, 1992.

Picnickers Campground STP is located on A1A North at Beverly Beach. It is a 0.01 MGD extended aeration sewage treatment plant. Chlorination is used for disinfection. The effluent from Picnickers Campground is passed through a tertiary sand filter before entering the Singing Surf STP, which is also a 0.01 MGD extended aeration facility. Combined treated effluent from the Singing Surf STP is dechlorinated prior to discharge into the Intracoastal Waterway.

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 two static acute screening toxicity bioassays on a sample of combined treated effluent from the Singing Surf STP. The bioassay organisms used for these tests were the water flea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*. The bioassays indicated that the sample was toxic to both test species, producing 24-hour LC_{50}'s of < 100%. In both tests, all the test organisms in the 100% concentrations died within 24 hours of test initiation.

Total residual chlorine was not detected in the sample. The total ammonia and unionized ammonia concentrations were 36.0 mg/L and 0.72 mg/L (Hach), respectively. Further chemical analyses were not performed on the sample.

The EPA document, *Quality Criteria for Water, 1986*, reports unionized ammonia to be acutely toxic to freshwater organisms at concentrations of 0.08 mg/L for fish and 0.53 mg/L for invertebrates. We attribute the toxicity noted in these tests to the unionized ammonia in the sample.

Conclusion

The sample of effluent from this facility was toxic on 21 January, 1992. The toxicity was attributed to the unionized ammonia in the sample.

Table 1. Concentration Series and Volumes Used for the Static Acute Screening Bioassays of the Singing Surf & Picnickers Campground STP on 22 to 23 January, 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. LC_{50} Data for Bioassay of the Singing Surf and Picnickers Campground STP, Flagler County, on 22 January, 1992.

Organism	Method of Data Analysis	24 Hour LC_{50}
Dechlorinated discharge		
Ceriodaphnia dubia	not calculated	< 100% [a]
Notropis leedsi	not calculated	< 100% [a]

[a] The LC_{50} is < 100% since all the organisms died in the lowest test concentration (100%).

Table 3. Data recorded during the static acute screening bioassay of a sample of effluent from the Singing Surf and Picnickers Campground STP, Beverly Beach, Flagler County, Florida, NPDES# FL0039519, on 22 to 23 January, 1992.

Facility:	**Singing Surf & Picnickers Campground STP**	NPDES #	**FL0039519**	Facility Type:	**Wastewater Treatment**
Location:	A1A North, Beverly Beach	Contact/District:	J. Wright / Northeast		
County:	Flagler	Test type:	static screening		
Sample Collection Date:	**1/21/92** Time: 1530	# tests:	2	Receiving Water:	Intracoastal waterway
Test Beginning Date:	1/22/92 Time: 1300	Chlorination Type:	**chlorinated**		
Test Ending Date:	1/23/92 Time: 1300	Dechlor Method:	plant dechlorination		**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Field:	not	measured
Lab:	0.0	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:	36.00	0.74

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	123	135
Cond. Control Water (daphnids):	77	100
100% Sample:	256	200

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours
LC50: < 100%

	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	24 hour
Control	5	5	-	8.1	8.3	-	23.0	23.6	-	8.7	8.1	-	173	177
Control	5	5	-	-	8.3	-	-	-	-	-	8.1	-	-	-
Control	5	5	-	-	8.3	-	-	-	-	-	8.1	-	-	-
Control	5	5	-	-	8.3	-	-	-	-	-	8.1	-	-	-
100%	5	0	-	7.4	8.4	-	23.5	23.7	-	8.2	7.6	-	1890	1803
100%	5	0	-	-	8.4	-	-	-	-	-	7.6	-	-	-
100%	5	0	-	-	8.4	-	-	-	-	-	7.6	-	-	-
100%	5	0	-	-	8.4	-	-	-	-	-	7.6	-	-	-

Organism: ***Notropis leedsi*** Age: 17 days
LC50: < 100%

	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	24 hour
Control	5	5	-	7.9	8.2	-	21.0	22.7	-	8.7	8.3	-	235	-
Control	5	5	-	7.9	8.2	-	-	-	-	8.7	8.3	-	-	242
100%	5	0	-	7.5	7.9	-	24.5	22.8	-	8.3	5.4	-	1933	-
100%	5	0	-	7.5	7.8	-	-	-	-	8.3	4.8	-	-	1876

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Singing Surf + Pickickers Camp
Address/City:
County: Flagler
Contact/District: Jim Wright / NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 1/21/92 Time 1530
Test Beginning: Date 1/22/92 Time 1310
Test Ending: Date 1/23/92 Time 1300
Test Organism: C. dubia
Life Stage/Age: ~~24~~ hours

Test Number: 1 of 2 Test Type: (Screening) Definitive
(Static) Static Renewal | Flow-through

27769

Remarks:
Terminated @ 24 hours

Instrument Callbrations:

	pH	DO	Temp	Cond
0 hr	7@7.09	8.7@23°C	22.3@22.5	1333@22.9 @ 1350
24 hr	7@7.09	8.6@23.5°C	22.6@22.6	1350@23.5°C@1364
48 hr	7@7.09	8.7@23°C	22.3@23°C	1332@22.8°C@1347

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		5	5		8.1	8.3		23.0	23.6		8.7	8.1		173	177	
Control		5	5			8.3					8.7	8.1				
Control		5	5			8.3						8.1				
Control		5	5			8.3						8.1				
100%		5	0		7.4	8.4		23.5	23.7		8.2	7.6		1890	1803	
100%		5	0			8.4						7.6				
100%		5	0			8.4						7.6				
100%		5	0			8.4						7.6				
Measured/Loaded by:		NA	NA		MF	MF		MF	MF		MF	MF		MF	MF	
Recorded by:		MF	MF		AJ	AJ		AJ	AJ		AJ	AJ		AJ	AJ	

Investigators' Signatures

Alison Jocla
Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Clz:	Cl blank = 0.0		not	meas	S.V. red
Lab Tot. Resid. Clz:	0.0	0.0	0.0	Hach	MF
Alkalinity:	123	77	256	Hach	AJ
Hardness:	135	100	200	Hach	AJ
Total Ammonia:	0.0	0.0	36.0	HACH	AJ

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

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Singing Surf and Picknickers Camp
Address/City:
County: Flagler
Contact/District: Jim Wright / NE
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 1/21/92 Time 1530
Test Beginning: Date 1/22/92 Time 1300
Test Ending: Date 1/23/92 Time 1300
Test Organism: N Cedrus
Life Stage/Age: 1 Day

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

27769

Remarks:

Terminated @ 24 hours

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.9@9	8.7@23.0	22.3@22.5	1333@229 @1350
24 hr	7.9@9	8.6@23.5°C	2360 226°C	1350@235°C@1346
48 hr	7.7.99	8.7@23.0°C	22.3@22.3°C	1334@225°C@1347

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	163	5	5		7.9	8.2		21.0	22.7		8.7	8.3		235		
Control	79	5	5		7.9	8.2					8.7	8.3			242	
100%	20	5	0		7.5	7.9		24.5	22.8		8.3	5.4		1933		
100%	3	5	0		7.5	7.8					8.3	4.8			1876	
Measured/Loaded by:		MF	MF		MF	MF		MF	MF		MF	MF		MF	MF	
Recorded by:		MF	MF		AJ	AJ		AJ	AJ		AJ	AJ		AJ	AJ	

Investigators' Signatures

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:	Chlor. Blank = 0.0		not	measured	
Lab Tot. Resid. Cl2:	0.0	0.0	0.0	Hach	MF
Alkalinity:	123	77	256	Hach	AJ
Hardness:	135	100	200	Hach	AJ
Total Ammonia:	0.0	0.0	36.0	Hach	AJ

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

The Bioassay of the Singing Surf and Picnickers Campground STP sampled on January 22, 1992, NPDES# FL0039519.

