

Bioassays of the City of

Dunedin Wastewater Treatment Plant

Dunedin, Pinellas County, Florida

NPDES #FL0021326

Sampled 3/18/96

June 1996

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan #870346G

Bioassays of the City of

Dunedin Wastewater Treatment Plant

Dunedin, Pinellas County, Florida

NPDES #FL0021326

Biology Section
Bureau of Laboratories
June 1996

Introduction

edin WWTP, 1140 Highland Ave., Dunedin, Pinellas County, Florida,
L0021326, tests performed on 19 to 21 March, 1996.

/TP facility has a design capacity of 6.0 MGD and an average flow of
ly 4.0 MGD. The WWTP also receives effluent from the City of
) facility, which has a permitted flow of 0.95 MGD. The WWTP
lergoes filtration, chlorination, and dechlorination prior to discharge
n Sound (facility summary provided by Brent Johnson, FDEP, Tampa).

ity tests discussed in this report were performed in accordance with
cribed by Weber, 1993, *Methods for Measuring the Acute Toxicity of*
d Receiving Waters to Freshwater and Marine Organisms, 4th
/600/4-90/027F.

Results and Discussion

P Biology Section performed two 48-hour static acute screening
says on a sample of chlorinated effluent from this facility. Two
-hour screening bioassays were performed on aliquots of the sample
hlorinated in the laboratory with 0.9 mL/L of 0.025N sodium
The test species used for these bioassays were the water flea,
dubia, and the bannerfin shiner, *Cyprinella leedsi*.

nated test results showed the sample to be acutely toxic to both test
ucing 100% mortality in both the *Cyprinella leedsi* test and in the
dubia test in 24 hours (Table 1). However, no mortality occurred in
dechlorinated-sample tests (Table 1, concluded).

lual chlorine in the sample was 0.79 mg/L in the laboratory and was
in the field. Total residual chlorine levels as low as 0.028 mg/L have
be acutely toxic to some freshwater fish and invertebrates (EPA
ia for Water 1986, EPA 44015-86-001, 1986). Total and unionized
centrations were 0.477 mg/L and 0.006 mg/L, respectively. Further
lyses were performed on the sample and several metals and
identified (Table 2).

Conclusion

The sample of effluent collected from this facility on March 18, 1996, showed toxicity in the chlorinated sample, but did not show toxicity in the aliquot of sample which was dechlorinated in the laboratory. We attribute the toxicity to the total residual chlorine content of the sample.

Table 1. Data recorded during the 48-hour acute toxicity screening bioassays of a sample of effluent from the City of Dunedin, Dunedin, Pinellas County, Florida, NPDES#FL0021326, performed on 19 to 20, March, 1996.

Chlorinated Test

Facility: **City of Dunedin** | NPDES # **FL0021326** | Facility Type: **WWTP**
Location: 1140 Highland Ave. | Contact/District: B. Johnson/Southwest
County: Pinellas | Test type: static acute screen
Sample Collection Date: 3/18/96 Time: 1015 | # tests: 4 | Receiving Water: St. Joseph Sound
Test Beginning Date: 3/19/96 Time: 1445 | Chlorination Type: **Chlorinated**
Test Ending Date: 3/20/96 Time: 1445

Total Residual CL2	mg/L	Method
Field:	not measured	
Lab:	0.79	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	0.00
20% Dilute Mineral Water (cladocerans):	< 0.017	0.00
100% Sample:	0.48	0.006

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	125	125
20% Dilute Mineral Water (cladocerans):	75	85
100% Sample:	95	295

Salinity	(ppt)
Control Water:	0
100% Sample:	0

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours old

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	pH 24 hour	pH 48 hour	Temperature[A] 0 hour	Temperature[A] 24 hour	Temperature[A] 48 hour	Dissolved Oxygen 0 hour	Dissolved Oxygen 24 hour	Dissolved Oxygen 48 hour	Conductivity Uncorrected µmhos/cm 0 hour	Conductivity Uncorrected µmhos/cm 24 hour
Control A	0/20	5	5	-	8.2	8.1	-	23.0	23.3	-	8.0	8.3	-	185	185
Control B	0/20	5	5	-	-	8.1	-	-	23.3	-	-	8.3	-	-	180
Control C	0/20	5	5	-	-	8.1	-	-	23.3	-	-	8.4	-	-	185
Control D	0/20	5	5	-	-	8.2	-	-	23.5	-	-	8.4	-	-	180
100% A	20/0	5	0	-	7.4	8.3	-	23.2	23.5	-	8.1	8.6	-	1175	1190
100% B	20/0	5	0	-	-	8.3	-	-	23.6	-	-	8.5	-	-	1215
100% C	20/0	5	0	-	-	8.3	-	-	23.6	-	-	8.5	-	-	1205
100% D	20/0	5	0	-	-	8.3	-	-	23.7	-	-	8.5	-	-	1180

[A] Temperature of test incubator was continously recorded on a strip chart recorder.
Incubator temperature range for the test period was 24.4-24.7°C.

Organism: ***Cyprinella leedsi*** Age: 12 days

Concentrations	Sample/Diluent Volume(mL)	SURVIVAL # Alive 0 hr	24 hr	48 hr	pH 0 hour	pH 24 hour	pH 48 hour	Temperature[B] 0 hour	Temperature[B] 24 hour	Temperature[B] 48 hour	Dissolved Oxygen 0 hour	Dissolved Oxygen 24 hour	Dissolved Oxygen 48 hour	Conductivity Uncorrected µmhos/cm 0 hour	Conductivity Uncorrected µmhos/cm 24 hour
Control A	0/500	5	5	-	8.0	8.4	-	23.6	22.8	-	8.0	8.6	-	245	245
Control B	0/500	5	5	-	8.0	8.4	-	23.5	22.7	-	8.0	8.5	-	245	240
Control C	0/500	5	5	-	8.0	8.4	-	23.5	22.7	-	8.0	8.6	-	245	240
Control D	0/500	5	5	-	8.0	8.4	-	23.4	22.6	-	8.0	8.6	-	245	240
100% A	500/0	5	0	-	7.3	8.0	-	23.4	23.0	-	7.8	8.6	-	1260	1245
100% B	500/0	5	0	-	7.3	8.0	-	23.3	23.0	-	7.7	8.5	-	1260	1240
100% C	500/0	5	0	-	7.3	8.0	-	23.3	22.9	-	7.7	8.8	-	1260	1240
100% D	500/0	5	0	-	7.3	8.0	-	23.2	22.9	-	7.6	8.7	-	1260	1235

[B] Temperature of test room was continously recorded on a strip chart recorder.
Room temperature range for the test period was 23.5-24.8°C.

-Continued-

Table 1. Concluded. Data recorded during the 48-hour acute toxicity screening bioassays of a sample of effluent from the City of Dunedin, Dunedin, Pinellas County, Florida, NPDES#FL0021326, performed on 19 to 21, March, 1996.

Dechlorinated Test

Facility: **City of Dunedin** NPDES # **FL0021326** Facility Type: **WWTP**
Location: 1140 Highland Ave., Dunedin Contact/District: B. Johnson/Southwest
County: Pinellas Test type: static acute screen
Sample Collection Date: 3/18/96 Time: 1015 # tests: 4 Receiving Water: St. Joseph Sound
Test Beginning Date: 3/19/96 Time: 1430 Chlorination Type: **Chlorinated***
Test Ending Date: 3/21/96 Time: 1430 **Page 2 of 2**

*Sample was dechlorinated in the laboratory with 0.9 mL/L of 0.025 N sodium thiosulfate.

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours old

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 µmhos/cm 0 hour	48 hour
Control A	0/20	5	5	5	8.2	-	8.3	23.2	-	23.6	8.1	-	7.8	185	195
Control B	0/20	5	5	5	-	-	8.3	-	-	23.5	-	-	7.8	-	205
Control C	0/20	5	5	5	-	-	8.3	-	-	23.4	-	-	7.9	-	195
Control D	0/20	5	5	5	-	-	8.3	-	-	23.3	-	-	7.9	-	200
100% A	20/0	5	5	5	7.5	-	8.3	23.3	-	23.5	7.9	-	7.9	1175	1275
100% B	20/0	5	5	5	-	-	8.3	-	-	23.5	-	-	7.8	-	1370
100% C	20/0	5	5	5	-	-	8.3	-	-	23.5	-	-	7.9	-	1350
100% D	20/0	5	5	5	-	-	8.3	-	-	23.3	-	-	7.9	-	1340

[A] Temperature of test incubator was continously recorded on a strip chart recorder.
Incubator temperature range for the test period was 24.4-24.7°C.

Organism: ***Cyprinella leedsi*** Age: 12 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 µmhos/cm 0 hour	48 hour
Control A	0/500	5	5	4	8.0	8.4	8.4	24.1	22.7	23.1	7.9	8.6	7.7	250	250
Control B	0/500	5	5	5	8.0	8.4	8.4	24.1	22.7	23.0	7.9	8.6	7.8	250	245
Control C	0/500	5	5	5	8.0	8.4	8.4	24.0	22.7	23.0	7.9	8.6	7.9	250	245
Control D	0/500	5	5	5	8.0	8.4	8.4	23.9	22.7	22.9	7.9	8.6	7.9	245	245
100% A	500/0	5	5	5	7.4	8.0	8.1	23.9	22.7	23.0	8.0	8.8	7.9	1250	1255
100% B	500/0	5	5	5	7.4	8.0	8.1	23.9	22.7	22.9	7.9	8.7	7.9	1250	1245
100% C	500/0	5	5	5	7.4	8.0	8.1	23.9	22.6	22.9	7.8	8.8	7.8	1250	1245
100% D	500/0	5	5	5	7.4	8.0	8.1	23.8	22.6	22.8	7.8	8.8	7.8	1250	1245

[B] Temperature of test room was continously recorded on a strip chart recorder.
Room temperature range for the test period was 23.5-24.8°C.

Total Residual CL2	mg/L	Method
Field:	not measured	
Lab:	<0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	0.00
20% Dilute Mineral Water (cladocerans):	< 0.017	0.00
100% Sample:	0.48	0.006

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	125	125
20% Dilute Mineral Water (cladocerans):	75	85
100% Sample:	95	295

Salinity	(ppt)
Control Water:	0
100% Sample:	0

Table 2. Results of chemical analyses on effluent from the City of Dunedin WWTP sampled on March 18, 1996.

Metals

Arsenic	10	µg/L[I]
Calcium	90.6	mg/L[A]
Iron	44	µg/L[A]
Magnesium	11.4	mg/L[A]
Zinc	31	µg/L[A]

Pesticides and Herbicides

Atrazine	0.16	µg/L[I]

Base, Neutral, & 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.

FDEP Biology Section — Acute Bioassay Bench Sheet

* MF 3/19/96 incorrect # times

Sample Source: Dunedin Mainland
County: Pinellas
Contact / District: Brent Johnson / Southwest
NPDES Permit #: FL0021326
LIMS Sample #: 13342 LIMS Job #: 96-MAR-19-09

Sample Collection: Date 3/18/96 Time 1015
Test Beginning: Date 3/19/96 Time ~~1430~~ 1430
Test Ending: Date 3-21-96 Time 1430
Organism Batch #: 17 Diluent Batch #: well
Organism Age: 12 days
Test Organism: ~~Ceriodaphnia dubia~~ Cyprinella leedsi 3/19

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

Test Number: 1 of 4

Remarks:
De Cl⁻
An aliquot of the sample was dechlorinated w/ 0.9 ml/L sodium thiosulfate.

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	23.4 @ 23.5	8.1 @ 25.7 °C	104.9 @ 106.2 1385 @ 1409 @ 24.4 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.4 @ 24.2 °C	108.0 @ 106.2 1403 @ 1409 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.5 @ 21.6	8.1 @ 25.4 °C	106.9 @ 106.2 1409 @ 1409 @ 25.0 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctl A	45	5	5	4/10	8.0	8.4	8.4	24.1	22.7	23.1	7.9	8.6	7.7	250	245	250
Ctl B	520	5	5	5	8.0	8.4	8.4	24.1	22.7	23.0	7.9	8.6	7.8	250	245	245
Ctl C	302	5	5	5	8.0	8.4	8.4	24.0	22.7	23.0	7.9	8.6	7.9	250	245	245
Ctl D	119	5	5	5	8.0	8.4	8.4	23.9	22.7	22.9	7.9	8.6	7.9	245	245	245
100% A	147	5	5	5	7.4	8.0	8.1	23.9	22.7	23.0	8.0	8.8	7.9	1250	1235	1255
100% B	65	5	5	5	7.4	8.0	8.1	23.9	22.7	22.9	7.9	8.7	7.9	1250	1230	1245
100% C	26	5	5	5	7.4	8.0	8.1	23.9	22.6	22.9	7.8	8.8	7.8	1250	1230	1245
100% D	21	5	5	5	7.4	8.0	8.1	23.8	22.6	22.8	7.8	8.8	7.8	1250	1235	1245
Measured/Loaded by:		DW	DW	DW	MF	TM	MF	MF	TM	MF	MF	JN	MF	MF	TM	MF
Recorded by:		MF	DW	JLS	DW	JN	JLS	DW	JN	JLS	DW	JN	JLS	DW	JN	JLS

Investigators' Signatures

Marshall Faircloth
Jennifer Spangler

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	—	~~0.74~~ <0.03	DR-100	JN
Alkalinity (mg/L as $CaCO_3$):	125	—	95	Hach	JLS
Hardness (mg/L as $CaCO_3$):	125	—	295	Hach	JLS
Total ammonia (mg/L as N):	<0.017	—	<0.017	Orion	JN

* ENTRY ERROR 3-19-96 JN

Ammonia Ammonia Ammonia Control 0 ppt Sample 0 ppt

Meter #98136 Meter Slope: -55.9 Blank: <0.017 Salinity: Salinity:

reviewer

form updated 5/05/95

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Dunedin Mainland
County: Pinellas
Contact / District: Brent Johnson / Southwest
NPDES Permit #: FL0021326
LIMS Sample #: 133142 LIMS Job #: 96-MAR-19-09

Sample Collection: Date 3/18/96 Time 1015
Test Beginning: Date 3/19/96 Time 1430
Test Ending: Date 3-21-96 Time 1430
Organism Batch #: 14 Diluent Batch #: 13
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia ~~Cyprinella leedsi~~ pwl 3/19

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

Test Number: 2 of 4

Remarks: D. C. T.
An aliquot of the sample was dechlorinated w/ 0.5 ml/L sodium thiosulfate.

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	23.4 @ 23.5	8.1 @ 25.7 °C	104.9 @ 106.2 1385 @ 1409 @ 24.4 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.4 @ 24.2 °C	1080 @ 106.2 1403 @ 1409 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.5 @ 21.6	8.1 @ 25.4 °C	106.9 @ 106.2 1409 @ 1409 @ 25.0 °C

Conc.	Chamber #	Number Live 0 hr	24 h	48 h	pH 0 hr	24 h	48 h	Temperature (°C) 0 hr	24 h	48 h	D.O. (mg/L) 0 hr	24 h	48 h	UNCORRECTED Cond. (mmhos/cm) ~~Cond. (µmhos/cm)~~ 0 hr	24 h	48 h
ctr	A	5	5	5	8.2		8.3	23.2		23.6	8.1		7.8	185		195
ctr	B	5	5	5			8.3			23.5			7.8			205
ctr	C	5	5	5			8.3			23.4			7.9			195
ctr	D	5	5	5			8.3			23.3			7.9			200
100%	A	5	5	5	7.5		8.3	23.3		23.5	7.9		7.9	1175		1275
100%	B	5	5	5			8.3			23.5			7.8			1370
100%	C	5	5	5			8.3			23.5			7.9			1350
100%	D	5	5	5			8.3			23.3			7.9			1340
Measured/Loaded by:		TM DW	MF	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		MF	MF	MF	DW		JLS	DW		JLS	DW		JLS	DW		JLS

Investigators' Signatures

Marshall Faircloth
Joseph Smith
Tina Mikulski
Jennifer Spampani

reviewer

form updated 5/05/95

*entry error 3/19/96 MF

Water Quality Parameters	Salt Water / Well Water / 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		<0.03*		
Lab Total Residual Cl2 (mg/L):	<0.03	0.74	DR-100	JN
Alkalinity (mg/L as $CaCO_3$):	75	95	Hach	JLS
Hardness (mg/L as $CaCO_3$):	85	295	Hach	JLS
Total ammonia (mg/L as N):	<0.017	<0.017	Orion	JN

Ammonia Meter #98136 Meter Slope: -55.9 Ammonia Blank: <0.017 Ammonia Control Salinity: 0 ppt

* Entry error 3-19-96 JN

Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Dunedin Mainland
County: Pinellas
Contact / District: Brent Johnson / SouthwesT
NPDES Permit #: FL0021326
LIMS Sample #: 133142 LIMS Job #: 96-MAR-19.09

Sample Collection: Date 3/15/96 Time 1015
Test Beginning: Date 3/19/96 Time 1445
Test Ending: Date 3-20-96 Time 1445
Organism Batch #: 17 Diluent Batch #: well
Organism Age: 12 days
Test Organism: Cyprinella leedsi / C. dubia 4/19

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

Test Number: 3 of 4

Remarks: C1 -
D = Dead Test Terminated at 24hr

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	23.4 @ 23.5	8.1 @ 25.1 °C	1049 @ 1062 1385 @ 1409 @ 24.4 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.4 @ 24.2 °C	1080 @ 1062 1403 @ 1409 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.5 @ 21.6	8.1 @ 25.4 °C	1069 @ 1062 1409 @ 1409 @ 25.0 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm))		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctr A	48	5	5		8.0	8.4		23.6	22.8		8.0	8.6		1245	1245	
Ctr B	1272	5	5		8.0	8.4		23.5	22.1		8.0	8.5		1245	1240	
Ctr C	20	5	5		8.0	8.4		23.5	22.7		8.0	8.6		1245	1240	
Ctr D	8	5	5		8.0	8.4		23.4	22.6		7.0	8.6		1245	1240	
100% A	602	5	0 50		7.3	8.0		24.4	23.0		7.8	8.6		1260	1245	
100% B	700	5	0 50		7.3	8.0		24.3	23.0		7.7	8.5		1260	1240	
100% C	763	5	0 50		7.3	8.0		24.3	22.9		7.7	8.8		1260	1240	
100% D	630	5	0 50		7.3	8.0		24.2	22.9		7.6	8.7		1260	1235	
Measured/Loaded by:		DW	DW		MF	TM		MF	TM		MF	TM		MF	TM	
Recorded by:		MF	DW		DW	JN		DW	JN		DW	JN		DW	JN	

Investigators' Signatures

Reviewer

form updated 5/05/95

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):			0.79	DR-100	JN
Alkalinity (mg/L as $CaCO_3$):	126		95	Hach	JLS
Hardness (mg/L as $CaCO_3$):	125		245	Hach	JLS
Total ammonia (mg/L as N):	<0.017		.477	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -55.9 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Dunedin Mainland
County: Pinellas
Contact / District: Brent Johnson / Southwest
NPDES Permit #: FL0021326
LIMS Sample #: 133142 LIMS Job #: 96-MAR-19-09

Sample Collection: Date 3/18/96 Time 1015
Test Beginning: Date 3/18/96 Time 1445
Test Ending: Date 3-20-96 Time 1445
Organism Batch #: 14 Diluent Batch #: 13
Organism Age: < 24hours
Test Organism: Ceriodaphnia dubia / Cyprinella leedsi 03/19

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

Test Number: 4 of 4

Remarks: C1 - Test terminated @ 24hours

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	23.4 @ 23.5	8.1 @ 25.7 °C	104.9 @ 106.2 1385 @ 1409 @ 24.4 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.4 @ 24.2 °C	108.0 @ 106.2 1403 @ 1409 @ 24.5 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	21.5 @ 21.6	8.1 @ 25.4 °C	106.9 @ 106.2 1409 @ 1409 @ 25.0 °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) (µmhos/cm) 0 hr	UNCORRECTED Cond. (mmhos/cm) (µmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) (µmhos/cm) 48 h
ctr	A	5	5		8.2	8.1		23.0	23.3		8.0	8.3		185	185	
ctr	B	5	5			8.1			23.3			8.3			180	
ctr	C	5	5			8.1			23.3			8.4			185	
ctr	D	5	5			8.2			23.5			8.4			180	
100%	A	5	0		7.4	8.3		23.2	23.5		8.1	8.6		1175	1190	
100%	B	5	0			8.3			23.6			8.5			1215	
100%	C	5	0			8.3			23.6			8.5			1205	
100%	D	5	0			8.3			23.7			8.5			1180	
Measured/Loaded by:		TM	MF		MF	TM		MF	JM		MF	TM		MF	TM	
Recorded by:		MF	MF		OW	JN		OW	JN		OW	JN		OW	JN	

Investigators' Signatures

reviewer

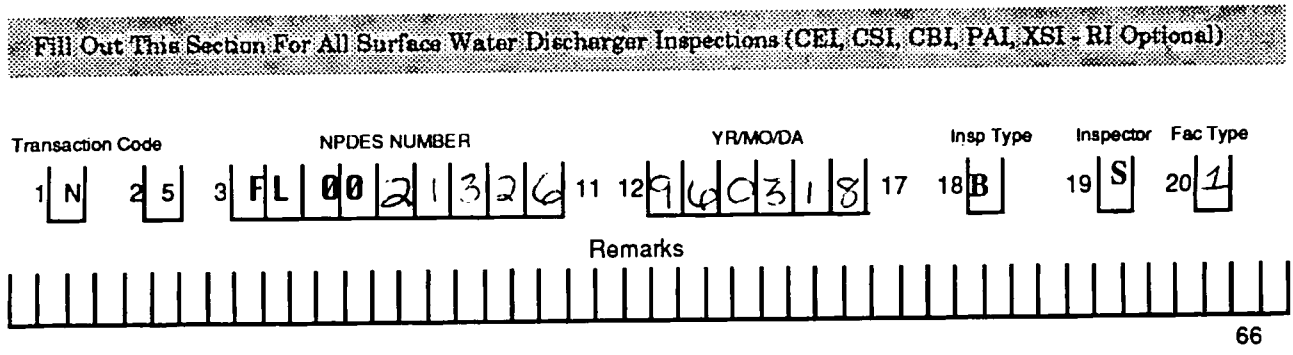
form updated 5/05/95

Salt Water / Well Water / (20% Min Water)

Water Quality Parameters		Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):				
Lab Total Residual Cl2 (mg/L):		0.79	DR-100	JN
Alkalinity (mg/L as $CaCO_3$):	75	95	Hach	JLS
Hardness (mg/L as $CaCO_3$):	85	295	Hach	JLS
Total ammonia (mg/L as N):	<0.017	.477	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -55.9 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of the City of Dunedin WWTP effluent sampled on March 18, 1996, NPDES #FL0021326.



The Priority Pollutants Analysis for the Bioassay of the City of Dunedin WWTP effluent sampled on March 18, 1996, NPDES #FL0021326.

