

Bioassays of

Marcus Bayou Water Reclamation Facility

Pensacola, Escambia County, Florida

NPDES #FL0031801

Sampled 9/27/99

June 2000

Biology Section

Division of Administrative & Technical Services

Comprehensive Quality Assurance Plan #870346G

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Bureau of Laboratories
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Introduction

Marcus Bayou WRF, 3050 Fayal Drive, Escambia County, Pensacola, Florida, NPDES #FL0031801, tests performed on 28 to 30 September 1999.

This Water Reclamation Facility, having a permitted capacity of 8.2 MGD was constructed by the expansion and modification of an existing 2.0 MGD WRF. The facility was permitted as an extended-aeration advanced domestic wastewater treatment plant. The facility has a mean flow of 2.592 MGD. The flow during the survey was 3.532 MGD. Treatment of effluent includes influent fine screening, anoxic/oxic activated sludge biological treatment, alum addition for phosphorus removal, secondary clarification, tertiary filters, and effluent ultraviolet disinfection. Effluent is discharged into the Bayou Marcus wetlands with discharge from the wetlands into Perdido Bay (facility summary provided by Glenn Butts, Kenny Ferguson, and Kim Allen, FDEP, Pensacola).

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 toxicity bioassays on a sample of effluent from the Marcus Bayou WRF. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The 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 and pesticides were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on September 27, 1999, did not show toxicity.

Table1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Bayou Marcus WRF, 3050 Fayal Drive, Pensacola , Escambia County, Florida, NPDES# FL0031801, performed on 28 to 30 September,1999.

Facility:	**Bayou Marcus WRF**			**NPDES #**	**FL0031801**	Facility Type:	**Wastewater Treatment Plant**
Location:	3050 Fayal Drive			Contact/District:	Glenn Butts/Northwest		
County:	Escambia			Test type:	static acute screen		
Sample Collection Date:	9/27/99	Time:	1010	# tests:	2	Receiving Water:	Perdido Bay
Test Beginning Date:	9/28/99	Time:	1400	Chlorination Type:	Not Chlorinated		
Test Ending Date:	9/30/99	Time:	1335				Page 1 of 1

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	<0.017
20% Dilute Mineral Water (cladocerans):	< 0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	135	138
20% Dilute Mineral Water (cladocerans):	80	82
100% Sample:	79	89

Salinity[C]	(ppt)
Control Water:	0
100% Sample:	0

[C] Salinity based on conductivity and temperature measurements.

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

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	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 A	0/20	5	5	5	8.2	-	8.4	24.1	-	24.1	7.6	-	7.8	167	205
Control B	0/20	5	5	5	-	-	8.4	-	-	24.1	-	-	7.9	-	200
Control C	0/20	5	5	5	-	-	8.4	-	-	24.1	-	-	7.9	-	190
Control D	0/20	5	5	5	-	-	8.4	-	-	24.2	-	-	7.9	-	200
100% A	20/0	5	5	5	7.7	-	8.4	24.6	-	24.1	7.5	-	7.9	435	485
100% B	20/0	5	5	4	-	-	8.4	-	-	24.1	-	-	7.9	-	500
100% C	20/0	5	5	4	-	-	8.4	-	-	24.0	-	-	7.9	-	500
100% D	20/0	5	5	5	-	-	8.4	-	-	24.0	-	-	7.9	-	515

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-26.0°C.
Incubator #2 temperature range for the test period was 24.5-25.5°C.

Organism: ***Cyprinella leedsi*** Age: 11 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	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 A	0/500	5	5	5	7.8	8.4	8.5	24.4	24.6	24.3	7.5	7.3	7.7	260	270
Control B	0/500	5	5	5	7.9	8.4	8.5	24.3	24.6	27.0	7.5	7.4	7.6	253	285
Control C	0/500	5	5	5	7.9	8.4	8.5	24.2	24.6	26.4	7.5	7.5	7.4	252	270
Control D	0/500	5	5	5	7.9	8.4	8.5	24.2	24.6	25.1	7.5	7.4	7.5	256	265
100% A	500/0	5	5	5	7.7	8.2	8.3	25.5	24.5	25.8	7.4	7.5	7.7	447	475
100% B	500/0	5	5	5	7.7	8.1	8.3	25.7	24.6	24.8	7.4	7.5	7.7	451	460
100% C	500/0	5	5	5	7.7	8.1	8.3	25.7	24.5	24.9	7.4	7.5	7.8	454	475
100% D	500/0	5	5	5	7.7	8.1	8.3	25.7	24.6	26.9	7.4	7.5	7.7	450	480

B Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-26.0°C.
Incubator #3 temperature range for the test period was 25.0-25.5°C.

Table 2. Results of chemical analyses on the effluent from the Bayou Marcus WRF sampled on September 27, 1999.

Metals

Copper	0.684	µg/L [I]
Calcium	28.7	mg/L
Iron_259	33	µg/L [I]
Magnesium	2.7	mg/L
Nickel	3.7	µg/L [I]
Nickel	2.7	µg/L [I]
Zinc	71	µg/L [J]

Pesticides and Herbicides

Atrazine	0.24	µg/L [I]
Diazinon	0.23	µg/L [I]

Base, Neutral, & Acid Extractable Organics

none detected

[J] Estimated value

[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

Sample Source: Bayou Marcus WWTP
County: Escambia
Contact / District: Glenn Butts / NW-DIST
NPDES Permit #: FL00 31801
LIMS Sample #: 410022 **LIMS Job #:** TLH 19990929 02
sample log 10/8/99 MF
Test Type: (Screening) Definitive
(Static) Static Renewal Flow-through
Test Number: ___ of ___

Remarks:

Sample Collection: Date 9/27/99 Time 1010
Test Beginning: Date 9/28/99 Time 1400
Test Ending: Date 9/30/99 Time 1335
Organism Batch #: 74 **Diluent Batch #:** Well
Organism Age: 11 days SRT toxicant batch #: ___
Test organism: C. dubia & C. sudai

DPH 9/28/99 W1

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) Cond. (µmhos/cm) 0 hr	24 h	48 h
CTRL A	B9	5	5	5	7.8	8.1	8.5	24.4	24.6	24.3	7.5	7.3	7.7	260	255	270
B	B10	5	5	5	7.9	8.1	8.5	24.3	24.6	27.0	7.5	7.4	7.6	253	250	285
C	B11	5	5	5	7.9	8.4	8.5	24.2	24.6	26.4	7.5	7.5	7.4	256	255	270
D	B12	5	5	5	7.9	8.4	8.5	24.2	24.6	25.1	7.5	7.4	7.5	256	255	265
100% A	B13	5	5	5	7.7	8.2	8.3	25.5	24.5	25.8	7.4	7.5	7.7	448	435	475
B	B14	5	5	5	7.7	8.1	8.3	25.7	24.6	24.8	7.4	7.5	7.7	451	445	460
C	B15	5	5	5	7.7	8.1	8.3	25.7	24.5	24.9	7.4	7.5	7.8	454	440	475
D	B16	5	5	5	7.7	8.1	8.3	25.7	24.6	26.9	7.4	7.5	7.7	450	445	480
measured by:		DPH	DPH	CH	SG	MF	CH	SG	MF	CH	SG	MF	CH	SG	MF	CH
recorded by:		SG	SG	CH	DPH	DPH	SG	DPH	DPH	SG	DPH	DPH	SG	DPH	DPH	SG

DPH 9/28/99 Final Dilution

Investigators' Signatures

Temperature Range °C
Incubator # 3 25.0 - 25.5°C
Room B246 24.0°C - 26.0°C

Water Quality Parameters	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			N/A	N/A		
Lab Total Residual Cl2 (mg/L):	<0.03	~~Pr~~ SG	<0.03	PR100	CH	DPH
Alkalinity (mg/L as $CaCO_3$):	135		79	HACH	SG	DPH
Hardness (mg/L as $CaCO_3$):	138		89	HACH	SG	DPH
Total ammonia (mg/L as N):	<0.017		<0.017	Nessler	MF	DPH
Salinity:	0		0	451	SG	DPH

reviewer form updated 3/3/99

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bayou Marcus WWTP
County: Escambia
Contact / District: Glenn Butts / NW-DIST
NPDES Permit #: FL0031801
LIMS Sample #: 410022 LIMS Job #: TLH19990929 02
sample log 10/8/99 mr
Test Type: Screening / Definitive
Static / Static Renewal / Flow-through
Test Number: ___ of ___

Remarks:

Sample Collection: Date 9/27/99 Time 1010
Test Beginning: Date 9/28/99 Time 14:00
Test Ending: Date 9/30/99 Time 13:35
Organism Batch #: 3647 Diluent Batch #: 39
Organism Age: <24hrs SRT toxicant batch #: ___
Test organism: C. dubia

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. (µmhos/cm) 0 hr	UNCORRECTED Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (µmhos/cm) 48 h
CTRL A	A	5	5	5	8.2		8.4	24.1		24.1	7.		7.8	167		205
B	B	5	5	5	—		8.4	—		24.1	—		7.9	—		200
C	C	5	5	5	—		8.4	—		24.1	—		7.9	—		190
D	D	5	5	5	—		8.4	—		24.2	—		7.9	—		200
100% A	A	5	5	5	7.7		8.4	24.6		24.1	9.5		7.9	435		485
B	B	5	5	4ID	—		8.4	—		24.1	—		7.9	—		500
C	C	5	5	4ID	—		8.4	—		24.0	—		7.9	—		500
D	D	5	5	5	—		8.4	—		24.0	—		7.9	—		515
measured by:		SG	SG	SG	SG		CH	SG		CH	SG		CH	SG		CH
recorded by:		DPH	SG	SG	DPH		SG	DPH		SG	DPH		SG	DPH		SG

Investigators' Signatures
Della Taylor Hall
Laurie Gerardi
Courtney Hall
Marshall Faircloth

Temperature Range °C
Incubator # 2 24.5 - 25.5°C
Room 624L 24.0°C - 26.0°C

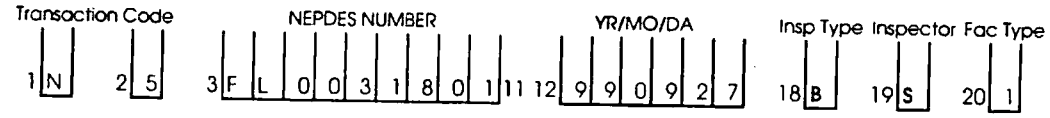
Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			N/A	N/A		
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	PR100	CH	DPH
Alkalinity (mg/L as $CaCO_3$):		80	79	HACH	SG	DPH
Hardness (mg/L as $CaCO_3$):		82	89	HACH	SG	DPH
Total ammonia (mg/L as N):		<0.017	<0.017	Denver	MVF	DPH
Salinity:		0	0 - 451 -		SG	DPH

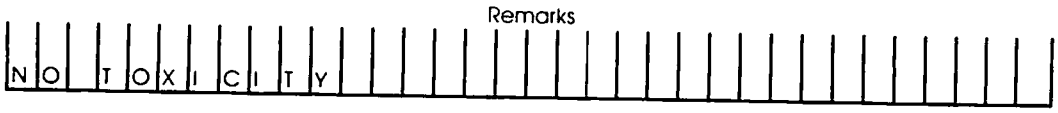
Jeff Wolfe
reviewer

form updated 3/3/99

The Bioassay of the Bayou Marcus WRF effluent sampled on September 27, 1999, NPDES #FL0021440

Fill Out This Section For All Surface Water Diwscharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

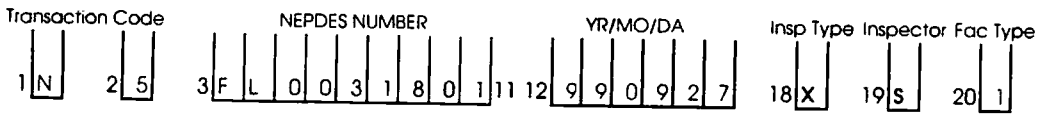


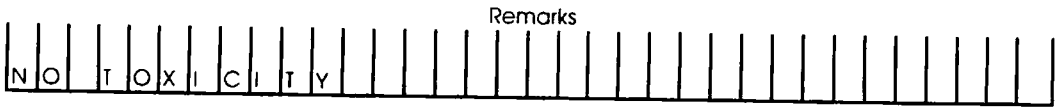


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The Priority Pollutants Analysis for Bioassay of Bayou Marcus WRF effluent sampled on September 27, 1999, NPDES #FL0031801

Fill Out This Section For All Surface Water Diwscharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)





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