

Bioassays of

Buckeye Cellulose Paper Mill Wastewater Treatment Plant

Perry, Taylor County, Florida

NPDES #FL0000876

Sampled 2/10/97

May 1997

Biology Section

Division of Administrative & Technical Services

Comprehensive Quality Assurance Plan #870346G

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Introduction

Buckeye Cellulose Paper Mill WWTP, County Road 30, Perry, Taylor County, Florida, NPDES #FL0000876, tests performed on 11 to 13 February, 1997.

This paper mill's wastewater treatment system has a design flow of 58 MGD. The wastewater treatment facility includes bar racks, a 320-foot diameter primary clarifier, a 30-acre aeration lagoon, and a 120-acre aeration lagoon. Effluent is discharged to the Fenholloway River (facility summary provided by Alex Athans, FDEP, Jacksonville).

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 this facility. The species used for these tests were the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results did not show toxicity (Table 1).

Total residual chlorine was not detected in the sample. The total ammonia and unionized ammonia concentrations were 3.02 mg/L and 0.045 mg/L, respectively. Further chemical analyses were performed on the sample and several metals and organic compounds were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on February 10, 1997, did not show toxicity.

Table 1. Data recorded during the 48-hour acute toxicity screening bioassays of a sample of effluent from the Buckeye Cellulose WWTP, Perry, Taylor County, Florida, NPDES#FL0000876, performed on 11 to 13 February, 1997.

Facility:	**Buckeye Cellulose WWTP**		**NPDES #**	**FL0000876**	Facility Type: **Paper Mill**
Location:	County Road 30, Perry		Contact/District:	T. McKelvey/Northeast	
County:	Taylor		Test type:	static acute screen	
Sample Collection Date:	2/10/97	Time: 1510	# tests:	2	Receiving Water: Fenholloway River
Test Beginning Date:	2/11/97	Time: 1415	Chlorination Type:	Non-chlorinated	
Test Ending Date:	2/13/97	Time: 1415			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
Control Water (20% DMW) (cladocerans):	< 0.017	< 0.017
100% Sample:	3.02	0.045

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	125	135
Control Water (20% DMW) (cladocerans):	70	90
100% Sample:	130	200

Salinity	(ppt)
Control Water (fish):	0
Control Water (20% DMW) (cladocerans):	0
100% Sample:	0

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

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity 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	24 hour
Control A	0/20	5	5	5	8.2	-	8.3	23.5	-	25.5	8.0	-	7.9	175	200
Control B	0/20	5	5	5	-	-	8.3	-	-	25.8	-	-	7.9	-	200
Control C	0/20	5	5	5	-	-	8.3	-	-	25.8	-	-	7.8	-	205
Control D	0/20	5	5	5	-	-	8.3	-	-	25.6	-	-	7.8	-	205
100% A	20/0	5	5	5	7.3	-	8.2	26.3	-	25.8	5.7	-	7.4	2530	2630
100% B	20/0	5	5	5	-	-	8.2	-	-	25.8	-	-	7.4	-	2640
100% C	20/0	5	5	5	-	-	8.2	-	-	25.8	-	-	7.3	-	2640
100% D	20/0	5	5	5	-	-	8.2	-	-	25.7	-	-	7.4	-	2610

[A] Temperature of test incubator was continously recorded on a strip chart recorder.

Incubator temperature range for the test period was 24.4-25.6°C.

Organism: ***Cyprinella leedsi*** Age: 12 to 14 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity 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	8.3	8.4	25.5	23.5	24.0	6.9	7.9	8.0	255	250
Control B	0/500	5	5	5	7.8	8.3	8.4	25.6	23.4	24.0	7.0	8.1	8.0	260	250
Control C	0/500	5	5	5	7.8	8.3	8.4	25.6	23.3	23.9	7.0	8.0	7.9	260	250
Control D	0/500	5	5	5	7.8	8.3	8.5	25.7	23.5	23.8	7.0	8.0	8.0	260	250
100% A	500/0	5	5	5	7.3	7.6	7.7	26.7	23.7	24.1	5.2	5.7	5.6	2600	2520
100% B	500/0	5	5	5	7.3	7.6	7.7	26.8	23.8	24.1	5.3	5.3	5.8	2620	2530
100% C	500/0	5	5	5	7.2	7.6	7.7	26.8	23.8	24.1	5.2	5.1	5.8	2620	2530
100% D	500/0	5	5	4	7.2	7.6	7.7	26.8	23.7	24.1	5.3	5.4	5.7	2620	2550

[B] Temperature of test room was continously recorded on a strip chart recorder.
Room temperature range for the test period was 24.0-25.0°C.

Table 2. Results of chemical analyses on the effluent from the Buckeye Cellulose WWTP sampled on February 10, 1997.

Metals

Aluminum	620	µg/L
Calcium	50.1	mg/L[A]
Copper	5	µg/L[I]
Iron	476	µg/L
Magnesium	19.7	mg/L[A]
Nickel	12	µg/L[A]
Silver	0.09	µg/L[I]
Zinc	38	µg/L[J]

Base, Neutral, & Acid Extractable Organics

2,4-Dichlorophenol	2.7	µg/L[I]
2,4,6-Trichlorophenol	6.5	µg/L

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.

J Estimated Value.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Buckeye
County: Taylor
Contact / District: Tim McKelvey / NortheasT
NPDES Permit #: FL0000876
LIMS Sample #: 167705 LIMS Job #: 97-Feb-11-06
sample log: 2-13-97

Sample Collection: Date 2/10/97 Time 1510
Test Beginning: Date 2/11/97 Time 1415
Test Ending: Date 2-13-97 Time 1415
Organism Batch #: 5 Diluent Batch #: 4
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Temperature range: room 24.0-25.0°C
incubator 24.4-25.4°C
Test Number: 1 of 2
Remarks: D = dead. M = missing

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	23.3 @ 23.4	8.1 @ 25.8 °C	103.1 @ 101.8 100 @ 1001 @ 24.9 °C 10090 @ 9885
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.1 @ 23.1	8.2 @ 25.1 °C	101.3 @ 101.8 999 @ 1001 @ 25.2 °C 10090 @ 9885
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.2 @ 23.3	8.2 @ 25.0 °C	103.8 @ 101.8 1008 @ 1001 @ 25.1 °C 10090 @ 9885

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	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 48 h
Control A	A	5	5	5	8.2		8.3	23.5		25.5	8.0		7.9	175		200
Control B	B	5	5	5			8.3			25.8			7.9			200
Control C	C	5	5	5			8.3			25.8			7.8			205
Control D	D	5	5	5			8.3			25.6			7.8			205
100% A	A	5	5	5	7.3		8.2	26.3		25.8	5.7		7.4	2530		2630
100% B	B	5	5	5			8.2			25.8			7.4			2640
100% C	C	5	5	5			8.2			25.8			7.3			2640
100% D	D	5	5	5			8.2			25.7			7.4			2610
Measured/Loaded by:		MF	JS	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		DW	JS	MF	JS		MF	JS		MF	JS		MF	JS		MF

Investigators' Signatures
Marshall Faircloth
Julie Sharpe
Tech Supv
A H Wolfe

Water Quality Parameters

	Salt Water / (Well Water)	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			NOT Measured		
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DR-100	JS
Alkalinity (mg/L as $CaCO_3$):	125	70	130	Hach	ND/JS
Hardness (mg/L as $CaCO_3$):	135	90	200	Hach	ND/JS
Total ammonia (mg/L as N):		<0.017	3.02	Orion	MF

Ammonia Meter #98136 Meter Slope −55.8 Ammonia Blank: <0.017 Control Salinity 0 ppt Sample Salinity: 0 ppt

form updated 4/96 rgc

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Buckeye
County: Taylor
Contact / District: Tim McKelvey / Northeast
NPDES Permit #: FL0000876
LIMS Sample #: 167705 LIMS Job #: 97-Feb-11-06
sample log: 2-13-97

Sample Collection: Date 2/10/97 Time 1510
Test Beginning: Date 2/11/97 Time 1415
Test Ending: Date 2-13-97 Time 1420
Organism Batch #: 8 Diluent Batch #: well
Organism Age: 11 days
Test Organism: Cyprinella leedsi

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Temperature range: room 24.0-25.0 °C
incubator 24.4-25.4°C
Test Number: 2 of 2
Remarks: D = dead, M = missing

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	23.3 @ 23.4	8.1 @ 25.8 °C	103.1 @ 101.8 1001 @ 1001 @ 24.9 °C 1009@9885
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.1 @ 23.1	8.2 @ 25.1 °C	101.3 @ 101.8 999 @ 1001 @ 25.2 °C 1009@9885
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.2 @ 23.3	8.2 @ 25.0 °C	103.8 @ 101.8 1008 @ 1001 @ 25.1 °C 1010@9885

Conc.	Chamber #	Number Live 0 hr	24 hr	48 hr	pH 0 hr	24 hr	48 hr	Temperature (°C) 0 hr	24 hr	48 hr	D.O. (mg/L) 0 hr	24 hr	48 hr	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 hr	48 hr
Control A	B1	5	5	5	7.8	8.3	8.4	25.5	23.5	24.0	6.9	7.9	8.0	255	245	250
Control B	B2	5	5	5	7.8	8.3	8.4	25.6	23.4	24.0	7.0	8.1	8.0	260	245	250
Control C	B3	5	5	5	7.8	8.3	8.4	25.6	23.3	23.9	7.0	8.0	7.9	260	245	250
Control D	B4	5	5	5	7.8	8.3	8.5	25.7	23.5	23.8	7.0	8.0	8.0	260	245	250
100% A	B5	5	5	5	7.3	7.6	7.7	24.7	23.7	24.1	5.2	5.7	5.8	2600	2450	2520
100% B	B6	5	5	5	7.3	7.6	7.7	24.8	23.8	24.1	5.3	5.3	5.8	2620	2500	2530
100% C	B7	5	5	5	7.2	7.6	7.7	24.8	23.8	24.1	5.2	5.1	5.8	2620	2500	2520
100% D	B8	5	5	4 ID	7.2	7.6	7.7	24.8	23.7	24.1	5.3	5.4	5.7	2620	2500	2550
											A D.O. 5.0 overwrite JS 2/14/97		B. correct D.O Reading is MF 2/13/97	5.6		
Measured/Loaded by:		NW	JS	MF	MF	JS	MF	MF	JS	MF	MF	JS	MF	MF	JS	MF
Recorded by:		HD	JS	MF	JS	JS	MF	JS	JS	MF	JS	JS	MF	JS	JS	MF

Investigators' Signatures
Marshall Faircloth
Julie Sharpe
Mark Smith

Salt Water / (Well Water)

Water Quality Parameters

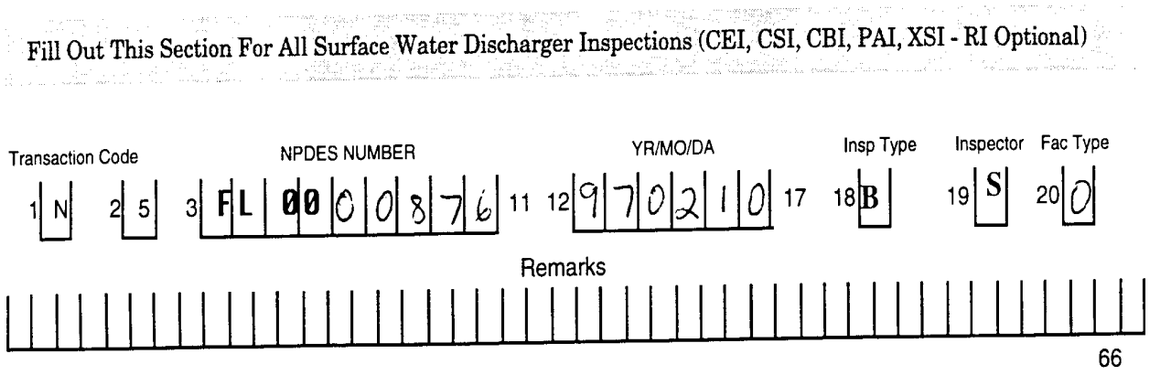
		20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			NOT measured		
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	<0.03	DR-100	JS
Alkalinity (mg/L as $CaCO_3$):	125	70	130	Hach	ND/JS
Hardness (mg/L as $CaCO_3$):	135	90	200	Hach	ND/JS
Total ammonia (mg/L as N):	<0.017		3.02	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -55.8 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

reviewer

form updated 4/01/96

The Bioassay of the Buckeye Cellulose effluent sampled on February 10, 1997, NPDES #FL0000876.



The Priority Pollutants Analysis for the Bioassay of the Buckeye Cellulose effluent sampled on February 10, 1997, NPDES #FL0000876.

