

Bioassays of

Buckeye Florida Pulp and Paper Facility

Perry, Taylor County, Florida

NPDES #FL0000876

Sampled 3/25/02

October 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Introduction

Buckeye Florida Pulp and Paper Facility, State Road 30, Perry, Taylor County, Florida, NPDES #FL0000876, tests performed on 26 to 28 March 2002.

The Buckeye Florida Pulp and Paper Mill wastewater treatment facility has a design flow of 58.0 MGD and an average flow of 40.45 MGD (daily average flow-March 2002). The wastewater treatment system includes a lift station, bar racks, a 320-foot diameter primary clarifier, 225 acres of sludge storage lagoons, a 30-acre aeration lagoon, and a 120-acre aeration lagoon. Final settling occurs in the 120-acre aeration lagoon prior to the effluent being discharged into the Class III freshwaters of the Fenholloway River (facility information provided by Azeem Syed, 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 collected from the Buckeye facility. The freshwater test species, the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*, were used in these bioassays. Due to excessive control mortality (15% mortality), the test using *Cyprinella leedsi* was invalidated. The test results did not indicate toxicity to the *C. dubia* test species within 48 hours (Table 1).

The total residual chlorine (TRC) concentration in the bioassay sample was not measured in the field and was less than the laboratory detection limit of 0.03 mg/L in the bioassay sample in the laboratory. Total and unionized ammonia concentrations in the bioassay sample were 4.3 mg/L and 0.184 mg/L, respectively. The total ammonia concentration in the sample preserved for chemical analysis was 5.0 mg/L. The calculated unionized ammonia concentration (using the field temperature, pH, and conductivity data) in the sample preserved for chemical analysis was 0.043 mg/L. The unionized ammonia values from both the bioassay sample and the chemistry sample exceeded the Florida Class III freshwater surface-water criterion for unionized ammonia of ≤ 0.02 mg/L. Additional samples were collected from this facility and analyzed for herbicides, nutrients, metals, organic compounds, and pesticides. Nutrients and several metals were identified in the effluent sample (Table 2).

Conclusion

The sample of effluent collected from this facility on March 25, 2002, did not show acute toxicity to the *Ceriodaphnia dubia* test organisms within 48 hours of test initiation. The unionized ammonia concentration in the effluent sample exceeded the Florida Class III freshwater surface-water criterion for unionized ammonia of ≤ 0.02 mg/L.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Buckeye Florida Pulp and Paper Mill, Highway 30, Perry, Taylor County, Florida, NPDES# FL0000876, performed from 26 to 28 March 2002.

Facility:	**Buckeye Florida Pulp and Paper Mill**	**NPDES #**	**FL0000876**	Facility Type:	**Kraft Pulp and**	**Analysts:**	Della Parker-Hanson
Location:	Highway 30, Perry	Contact/District:	Jeremy Richardo/Northeast		**Paper Mill**		Joshua Ayres
County:	Taylor	Test type:	static acute screen				Gary Hardie
Sample Collection Date:	3/25/2002 Time: 1558	# tests:	1	Receiving Water:	Fenholloway River		Marshall Faircloth
Test Beginning Date:	3/26/2002 Time: 1330	Chlorination Type:	Non-chlorinated	Classification:	Class III Freshwater		
Test Ending Date:	3/28/2002 Time: 1400		sample collected after dechlorination		**Page 1 of 1**	**Reviewer:**	David Whiting

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

	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	8.1	-	8.3	24.4	-	23.1	8.1	-	7.5	175	250
Control B	0/20	5	5	5	-	-	8.4	-	-	23.0	-	-	7.4	-	240
Control C	0/20	5	5	5	-	-	8.4	-	-	23.1	-	-	7.7	-	240
Control D	0/20	5	5	4	-	-	8.4	-	-	23.1	-	-	7.8	-	235
100% A	20/0	5	5	5	7.8	-	8.3	24.7	-	23.2	6.7	-	7.2	1920	2570
100% B	20/0	5	5	5	-	-	8.3	-	-	23.1	-	-	7.1	-	2570
100% C	20/0	5	5	5	-	-	8.2	-	-	23.1	-	-	7.1	-	2460
100% D	20/0	5	5	5	-	-	8.1	-	-	23.1	-	-	7.1	-	2480

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-25.5 °C.
Incubator #3 temperature range for the test period was 23.5-25.5°C.

LIMS	
Job number:	TLH-2002-03-26-02
sample number:	583675

Data Transcription Verification	
date:	8/26/2002
by:	Joshua Ayres
	Jacquelyn M. Brynda

Total Residual CL2	mg/L	Method
Field:	Not Measured	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (water flea):	<0.017	<0.017
100% Sample:	4.30	0.184

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (water flea):	74	76
100% Sample:	190	200

Table 2. Results of the chemical analyses on the effluent from the Buckeye Florida Facility, sampled on March 25, 2002.

Metals

Aluminum	500	µg/L	
Calcium	48.6	mg/L	
Cadmium	0.24	µg/L	
Chromium	5.9	µg/L	I
Copper	4.9	µg/L	I
Iron	390	µg/L	
Lead	0.62	µg/L	I
Magnesium	21.5	mg/L	
Nickel	8.2	µg/L	
Silver	0.082	µg/L	
Zinc	26.3	µg/L	

Nutrients

Ammonia	5.0	mg N/L	
Nitrite+Nitrate	0.004	mg N/L	U
Total Kjeldahl Nitrogen	6.0	mg N/L	
Ortho-Phosphate	0.78	mg P/L	
Total Phosphorus	1.2	mg P/L	
TOC	111	mg C/L	

Pesticides and Herbicides

None detected

Base, Neutral, & Acid Extractable Organics

None detected

Volatile Organic Compounds

None detected

[U] Material was analyzed for but not detected; the value given is the minimum detection limit.
[I] The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

The Bioassay of the Buckeye Florida effluent sampled on March 25, 2002, NPDES #FL0000876.

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

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 F L 0 0 0 0 8 7 6 #	#	0 2 0 3 2 5	#	**B**	# **S**	# 2

Remarks

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The Priority Pollutants Analysis for the Bioassay of the Buckeye Florida effluent sampled on March 25, 2002, NPDES #FL0000876.

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

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 F L 0 0 0 0 8 7 6 #	#	0 2 0 3 2 5	#	**X**	# **S**	# 2

Remarks

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