

Bioassays of

Georgia-Pacific Corporation Wastewater Treatment Plant

Palatka, Putnum County, Florida

NPDES #FL0002763

Sampled 4/29/02

November 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Introduction

Georgia-Pacific Corporation Wastewater Treatment Plant, Highway 216, Palatka, Putnum County, Florida, NPDES #FL0002763, tests performed on 30 April to 2 May 2002.

The Georgia-Pacific Corporation's Palatka facility is a pulp and paper mill. Wastewater is generated from the digesting and bleaching operations associated with the pulp and paper process. The facility's industrial wastewater treatment system has a design flow of 40 MGD and an average flow of 26 MGD (March 2001-April 2002). The industrial wastewater treatment plant treats effluent by screening with a vertical bar screen followed by primary clarification. After the clarifier, wastewater is pumped to 900+ acres of anaerobic, facultative, and aerobic lagoons. The plant also has an oxygen injection system that injects pure oxygen into two effluent side-streams. The two effluent side-streams are split out from the main effluent-stream prior to effluent from all three waste streams being discharged in the Class III freshwaters of Rice Creek. The discharge from the three streams is included in the average daily flow (facility information provided by Jeremy Richarde, 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 outfall-001A of the Georgia-Pacific Corporation's Palatka Facility. The freshwater test species, the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*, were used in these bioassays. The test results did not indicate toxicity to either test species within 48 hours (Table 1).

Total Residual Chlorine (TRC) was not measured in the field and was 0.09 mg/L in the bioassay sample in the laboratory. The TRC could be an artifact, as the treated effluent is not chlorinated prior to discharge; however, the TRC might be residual from the industrial processes. If chlorine is a constituent of the effluent as quantified, then the effluent is in violation of the Florida Class III freshwater criterion for chlorine of $\leq$0.01 mg/L (FAC 62-302.530). Total ammonia was not detected in the bioassay sample. The total ammonia concentration in the sample preserved for chemical analysis was 0.087 mg/L. Additional samples of effluent were collected from Outfall-001A and analyzed for algal growth potential, herbicides, nutrients, metals, oil and grease, organic compounds, and pesticides. Samples were also collected from Outfalls-001 and Outfall-002 and analyzed for metals. Results of these analyses are listed in Table 2.

Conclusion

The sample of effluent collected from this facility on April 29, 2002, did not show acute toxicity to either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Georgia-Pacific Corporation Wastewater Treatment Facility, Highway 216, Palatka, Putnum County, Florida, NPDES# FL0002763, performed from 30 April to 2 May 2002.

Facility:	**Georgia-Pacific Corporation WWTP**	**NPDES #**	**FL0002763**	Facility Type:	**Paper Mill**	**Analysts:**	Della Parker-Hanson
Location:	Highway 216, Palatka	Contact/District:	Jeremy Richarde/Northeast		**Wastewater Treatment**		Joshua Ayres
County:	Putnum	Test type:	static acute screen		**System**		Gary Hardie
Sample Collection Date:	4/29/2002 Time: 1205	# tests:	2	Receiving Water:	Rice Creek		Marshall Faircloth
Test Beginning Date:	4/30/2002 Time: 1330	Chlorination Type:	Non-chlorinated	Classification:	Class III Freshwater		Jacquelyn Brynda
Test Ending Date:	5/2/2002 Time: 1345				**Page 1 of 1**	**Reviewer:**	David Whiting

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

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen[B]			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	-	8.1	24.4	-	24.5	8.0	-	7.8	145	150
Control B	0/20	5	5	5	-	-	8.2	-	-	24.5	-	-	7.7	-	160
Control C	0/20	5	5	5	-	-	8.2	-	-	24.5	-	-	7.7	-	165
Control D	0/20	5	5	5	-	-	8.2	-	-	24.4	-	-	7.7	-	160
100% A	20/0	5	5	5	8.2	-	8.9	24.9	-	24.4	7.1	-	7.7	2050	2110
100% B	20/0	5	5	5	-	-	8.9	-	-	24.4	-	-	7.6	-	2280
100% C	20/0	5	5	5	-	-	8.9	-	-	24.4	-	-	7.5	-	2310
100% D	20/0	5	5	5	-	-	8.9	-	-	24.4	-	-	7.5	-	2320

LIMS	
Job number:	TLH-2002-04-30-02
sample number:	591794

Data Transcription Verification	
date:	9/6/2002
by:	Jacquelyn Brynda
	Joshua Ayres

Total Residual CL2	mg/L	Method
Field:	not measured	-
Lab:	0.09	Hach

Organism: ***Cyprinella leedsi*** Life stage: 13 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen[B]			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	7.9	8.3	8.5	25.6	25.1	24.6	7.1	7.3	7.8	270	275
Control B	0/500	5	5	5	7.9	8.5	8.5	25.7	26.0	24.7	7.2	7.4	7.8	265	285
Control C	0/500	5	5	5	7.9	8.4	8.5	25.7	24.3	24.6	7.3	7.5	7.7	245	280
Control D	0/500	5	5	5	8.0	8.4	8.5	25.8	24.2	24.4	7.3	7.6	7.8	260	275
100% A	500/0	5	5	5	8.3	8.5	8.7	24.9	25.1	24.4	7.2	6.7	6.9	1990	2100
100% B	500/0	5	5	5	8.3	8.5	8.7	24.7	24.9	24.3	7.2	6.7	6.9	2160	2210
100 % C	500/0	5	5	5	8.3	8.5	8.7	24.7	24.6	24.3	7.1	6.7	6.9	2210	2320
100% D	500/0	5	5	5	8.3	8.5	8.7	24.9	25.7	24.7	7.2	6.7	6.8	2220	2290

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

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	137	135
Control water (water flea):	75	76
100% Sample:	457	193

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-27.0 °C.
Incubator #3 temperature range for the test period was 23.5-24.5°C.

[B] Sample was aerated for approximately 10 minutes to increase the dissolved oxygen concentration in the sample from 4.5 mg/L to 7.8 mg/L prior to test initiation.

Table 2. Results of chemical analyses on the effluent from the Georgia-Pacific Corporation Wastewater Treatment Facility sampled on April 29, 2002.

Metals

	Outfall-001A	Outfall 001 Edge of mixing zone	Outfall 002 Edge of mixing zone		
Aluminum	4,780	3,540	2,180	µg/L	
Cadmium	0.15	0.12	0.071	µg/L	
Calcium	56.3	48.8	49.4	mg/L	
Chromium	6.6	5.2	3.1	µg/L	I
Copper	3.0	2.4	2.1	µg/L	I
Iron	494	613	515	µg/L	
Lead	1.88	1.59	1.41	µg/L	
Magnesium	9.6	9.2	12.7	mg/L	
Nickel	37.8	26.9	15.1	µg/L	
Silver	0.047	0.033	0.023	µg/L	I
Zinc	21	16	10	µg/L	

Algal Growth Potential

Algal Growth Potential	10.27 mg dry-wt./L	A

Nutrients

Ammonia-N	0.087	mg N/L	
Nitrite+Nitrate-N	0.49	mg N/L	
Total Kjeldahl Nitrogen	2.6	mg N/L	
Orthophosphate-P	0.004	mg P/L	U
Total Phosphorus-P	0.65	mg P/L	

Oil and Grease

None detected

Pesticides and Herbicides

None detected

Base, Neutral, & Acid Extractable Organics

None detected

A Value reported is the mean of two or more determinations

I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U Material was analyzed for but not detected; The value reported is the minimum detection limit.

The Bioassay of the Georgia-Pacific Corporation effluent sampled on April 29, 2002, NPDES #FL0002763.

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	2	7	6	3	#	#	0	2	0	4	2	9	# **B**	# **S**	# 2

Remarks

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The Priority Pollutants Analysis for the Bioassay of the Georgia-Pacific Corporation effluent sampled on April 29, 2002, NPDES #FL0002763.

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	2	7	6	3	#	#	0	2	0	4	2	9	# **X**	# **S**	# 2

Remarks

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