Effluent Quality Assessment of

Georgia – Pacific (Palatka Pulp & Paper)

Putnam County

NPDES # FL0002763

Sampled April 6, 8, 20, 22 and 24, 2015

September 2015

Biology Section

Bureau of Laboratories

Division of Environmental Assessment and Restoration

2015 FDEP Bureau of Laboratories Quality Manual

NELAC Certification No. E31780

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Georgia - Pacific (Palatka Pulp & Paper), County Road 216, Palatka, Putnam County, Florida, 32177. NPDES #FL0002763.

Facility Overview

Georgia - Pacific (Palatka Pulp & Paper) is a pulp and paper mill producing both bleached and unbleached pulp and paper utilizing the Kraft process. See Appendix A for a description of the facility, summary of permit limits, Administrative Order (AO) and Discharge Monitoring Report (DMR) information.

Methods

Effluent composite samples for toxicity testing were collected on April 6, April 8, April 20, April 22 and April 24, 2015. Effluent composite samples for biological and chemical analyses for this facility were collected on April 6, 2015. A composite sample for total ammonia was collected on April 20, 2014. All samples were collected from the EFF-3 NPDES sampling point for Outfall D-003 by Sharon Piltz, Amy Kalmbacher, Allison Cala, Kimberly Mann and Jann Gruentzel (FDEP Northeast District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling (see Appendix B).

The 7 day chronic definitive toxicity tests were performed following internal DEP SOPs TA07_05 and TA07_09 (see Appendix B).

Bioassay tests performed on samples collected on April 6 and April 8, 2015, were terminated prior to completion due to a shipping issue (FEDEx failed to deliver) with the third sample. The *Ceriodaphnia dubia* test initiated on April 21, 2015, was invalidated due to excess mortality in the controls.

Results

Chemistry Results (See Table 1, Table 2, Table 3 and Appendix C)

- The total ammonia concentrations in the composite sample collected and preserved for chemical analysis on April 6 and April 20, 2015, were 2.7 mg N/L and 2.4 mg N/L, respectively. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentrations for both samples were 0.1 mg/L, which exceeds the Class III Freshwater Quality Criterion (62-302.530 (3) but not the permitted limit.
- Total ammonia was the only chemical parameter collected on April 20, 2015.
- Arsenic, chromium, copper and nickel were detected in the effluent at levels that comply with Class III Fresh Water Quality Criteria (62-302.530, F.A.C.). Cadmium and lead were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). The effluent's dissolved oxygen (2.02 mg/L April 6, 2015 and 0.48 mg/L April 20, 2015) exceeded both the Class III Freshwater Criterion and the permitted limit. The dissolved oxygen values represent percent saturation values that also exceed the Class III Freshwater Criterion (62-302.533 (I)(a)(3) for the Northeast Region. Due to the lack of background specific conductance, it could not be determined if the effluent's specific conductance (1630 µmhos/cm April 6, 2015 and 1799 µmhos/cm April 20, 2015) exceeded Class III Freshwater Criterion. The effluent's permitted limit (2467 µmhos/cm) was not exceeded.

Toxicity Test Results (See Table 2 and Appendix C)

- Tests were performed April 21 - 28, 2015.

Ceriodaphnia dubia 7-day chronic definitive bioassay – IC25: No Result
NOEC: No Result

Pimephales promelas 7-day chronic definitive bioassay – IC25: > 100%
NOEC: 100%

*NOTE: A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits.

- The bioassay samples were not chronically toxic to the *Pimephales promelas* test organisms. Due to test invalidation, a result was not determined in the *Ceriodaphnia dubia* bioassay.

Conclusion

The effluent sample collected from the EFF-3 NPDES sampling point for this facility on, April 20, April 22 and April 24, 2015, was not chronically toxic to the *Pimephales promelas* test organisms during the 7 - day chronic definitive bioassays. The *Ceriodaphnia dubia* bioassay was invalidated due to control mortality exceeding allowable limits. Effluent water quality samples collected on April 6 and April 20, 2015, exceeded the Class III Freshwater Quality Criterion criteria and permit limits for dissolved oxygen. Due to the lack of background specific conductance, it could not be determined if the effluent's specific conductance (1630 µmhos/cm April 6, 2015 and 1799 µmhos/cm April 20, 2015) exceeded Class III Freshwater Criterion. The effluent's permitted limit (2467 µmhos/cm) was not exceeded. Additional water quality samples did not exceed any applicable water quality standards or violate any permit conditions.

For additional information concerning this sampling event, including bioassay bench sheets and SRT data, please contact Diane.Power@dep.state.fl.us and/or Joseph.Faircloth@dep.state.fl.us.

Literature Cited

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Stevenson, R. J. and L. L. Bahls. 1999. Periphyton protocols. Pp. 6.1-6.22 in: Rapid bioassessment protocols for use in wadeable streams and rivers. 2nd edition. By: M. T. Barbour, J. Gerritsen, B. D. Snyder and J. B. Stribling. EPA 841-B-99-002. U. S. Environmental Protection Agency, Office of Water, Washington, D. C.

USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. 4th edition. EPA-821-R-02-013.

Table 1. Effluent limits, Class III Freshwater Criteria and field parameters

Georgia-Pacific	Units	Class III Criteria	Effluent Permit Limits	GP Final Eff, Comp, 4/6/15	GP Final Eff, Comp, 4/20/15
Sample Depth	m	-	-	0.2	0.1
Temperature	C	-	-	24.0	25.9
pH	SU	6.0 - 8.5	6.0 - 8.5	7.56	7.78
Specific Conductance	umhos/cm	≤ 1,275	≤ 2467	1630 e	1799 e
Salinity	ppth	-	-	0.8 c	0.9 c
Dissolved Oxygen	% saturation	≥ 34	-	24.11 e	5.93 e
Dissolved Oxygen	mg/L	≥ 5.0	≥ 5.0	2.02 e	0.48 e
Flow (2/1/2014 - 1/31/2015)	MGD	-	Report	22.8	-
Total Residual Chlorine	mg/L	≤ 0.01	-	-	< 0.03 d

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

c - Value is calculated

d - measurement taken in the FDEP laboratory

e - Value exceeds the Class III Water Quality Criteria or permit limits

Table 2. Effluent limits, Class III Freshwater Criteria and analytical water chemistry data

Georgia-Pacific	Units	Class III Criteria	Effluent Permit Limits	GP Final Eff, Comp, 4/6/15	GP Final Eff, Comp, 4/20/15
Total Phosphorus	mg P/L	-	Report	0.68	-
Total Ammonia	mg N/L	-	Report	2.7	2.4
Un-ionized Ammonia (calculated salinity)	mg N/L	≤ 0.02 s	-	0.1 c	0.1 c
Nitrate and Nitrite	mg N/L	-	-	0.015	-
Total Kjeldahl Nitrogen	mg N/L	-	Report	5.2	-
Organic Nitrogen	mg N/L	-	-	2.5 c	-
Total Nitrogen	mg N/L	-	Report	5.2 c	-
BOD, 5 day, N - uninhibited	mg/L	-	Report	8.3	-
Total Suspended Solids	mg/L	-	Report	4 I	-
Toxicity (Chronic Definitive, IC25)					
Bioassay - Water flea *(Ceriodaphnia dubia)*	%	≥ 100	≥ 11.7	No Result[1]	No Result[2]
Bioassay - Fish *(Pimephales promelas)*	%	≥ 100	≥ 11.7	No Result[1]	≥ 100

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

c - Value is calculated

s - Single sample

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

U - Material analyzed for but not detected; value reported is the method detection limit

1 - Test terminated. Final sample never received.

2 - Excess mortality in control organisms on Day 7 of test.

Table 3. Effluent limits, Class III Freshwater Criteria and analytical metals data

Georgia-Pacific	Units	Class III Criteria	Effluent Permit Limits	GP Final Eff, Comp, 4/6/15
Arsenic	ug/L	≤ 50	-	1.35
Cadmium	ug/L	≤ 0.46 b	-	0.071 I
Chromium, Total [3]	ug/L	≤ 155 b	-	1.9
Copper	ug/L	≤ 17.2 b	-	1.07
Lead	ug/L	≤ 7.91 b	-	0.54 I
Mercury	ug/L	0.012	-	0.10 U
Nickel	ug/L	≤ 95.6 b	-	1.80
Selenium	ug/L	≤ 5.0	-	0.20 U
Silver	ug/L	≤ 0.07	-	0.025 U

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
b - Value is calculated based on hardness, (62-302.530(3))
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
U - Material analyzed for but not detected; value reported is the method detection limit
3 - Class III Freshwater Quality Criterion (62-302.530(19)(a), F.A.C.) is for chromium-III

Appendix A

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Herndon Sims	**Contact Number:** (904) 256-1612
Facility Name (as it appears on permit): Georgia-Pacific (Palatka Pulp & Paper)	**Former Names:**
NPDES Permit Number: FL0002763	**Permit Expiration Date:** December 17, 2017
Physical Address: County Road 216, Palatka Florida 32177	
District: Northeast District	**County:** Putnam
Function of Facility: Pulp and paper mill producing both bleached and unbleached pulp and paper utilizing the Kraft process. Products include Kraft paper and finished tissue products.	
Facility Type: Industrial Wastewater	**Permitted Capacity (MGD):** 23 MGD
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): 22.8 MGD February 2014 – January 2015	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s):
Outfall D-003 EFF-3: Final Effluent after treatment prior to entering the pipeline
EFF-4: Final Effluent at the pipeline valve house off Comfort Road
Outfall R-001 OUI-4: A combination of sample taken just after the discharge from the chlorine dioxide filtrate tank and a sample taken just after the extraction filtrate tank.

Description of Permitted Outfall(s):
The discharge to the Lower St. Johns River consists of a pump station, force main pipeline and required appurtenances for the conveyance of the effluent from the treatment lagoons to the Lower St. Johns River (Class III Fresh waters – WBID 2213L) through Outfall D-003 via a 36-inch diameter pipeline and 1043 foot long diffuser. High purity oxygen is added at the pump station to ensure the discharge meets the dissolved oxygen criterion. The point of discharge is located approximately at latitude 29° 41' 13" N, longitude 81° 38' 24" W.

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility):
This is a 23 MGD annual average wastewater treatment facility that consists of primary clarification followed by secondary treatment consisting of facultative and aerobic lagoons. Most of the wastewater treatment solids from the primary clarifier are pumped to sludge lagoons for draining and air drying. A small portion is pumped to a mechanical dewatering system. The dewatered cake is sent to the sludge management unit for disposal. Treated effluent, injected with high purity oxygen, is discharged to the Lower St. Johns River through a force main pipeline to Outfall D-003. Supplemental high purity oxygen system has been installed to provide oxygen to Rice Creek.

The facility also operates and maintains an on-site solid waste disposal facility which receives clean construction debris, calcium carbonate, boiler ash, and other solids generated as by-products from the pulping and papermaking operation. The facility operates and maintains the surface water management system including in-line retention basins 1, 4, 5 and wet detention basin 2 to receive and treat storm water runoff from the solid waste disposal area.

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under
(Leave cell blank if not applicable)

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/Min	Limit	Statistical Basis	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Chronic Whole Effluent Toxicity, 7-Day IC25 (*Ceriodaphnia dubia*)	percent	Min	11.7	Single Sample	Quarterly	24-hr FPC	EFF-3	See I.A.7 and I.A.8
Chronic Whole Effluent Toxicity, 7-Day IC25 (*Pimephales promelas*)	percent	Min	11.7	Single Sample	Quarterly	24-hr FPC	EFF-3	See I.A.7 and I.A.8
Flow	MGD		Report Report Report	Daily Maximum Monthly Average Annual Average	Continuous	Meter	EFF-3	
BOD, 5-day, 20ºC	mg/L		Report Report	Daily Maximum Monthly Average	1 Day/Week	24-hr FPC	EFF-3	See I.A.9
BOD, 5-day, 20ºC	lb/day	Max Max Max Max	7,000 14,340 3,500 7,170	Daily Maximum Daily Maximum Monthly Average Monthly Average	1 Day/Week	24-hr FPC	EFF-3	See I.A.9 Jun – Nov Dec – May Jun – Nov Dec – May
Solids, Total Suspended	mg/L		Report Report	Daily Maximum Monthly Average	1 Day/Week	24-hr FPC	EFF-3	See I.A.9
Solids, Total Suspended	lb/day	Max Max Max Max	10,000 17,500 5,000 10,000	Daily Maximum Daily Maximum Monthly Average Monthly Average	1 Day/Week	24-hr FPC	EFF-3	See I.A.9 Jun – Nov Dec – May Jun – Nov Dec – May
pH	s.u.	Min Max	6.0 8.5	Daily Minimum Daily Maximum	5 Days/Week	Grab	EFF-3	See I.A.5
Oxygen, Dissolved (DO)	mg/L	Min	5.0	Daily Minimum	5 Days/Week	Grab	EFF-4	See I.A.10
Adsorbable Organic Halides (AOX)	lb/day	Max Max Max	449 1,002 1641	Annual Average Monthly Average Daily Maximum	3 Days/Week	24-hr FPC	EFF-3	
Coliform, Fecal	#/100mL	Max Max	200 800	Monthly Geometric Mean Daily Maximum	Monthly	Grab	EFF-3	
Color	PCU	Max	1,202	Daily Maximum	Monthly	Grab	EFF-3	See I.A.8
Specific Conductance	□mhos/cm	Max	2,467	Daily Maximum	Monthly	Grab	EFF-3	See I.A.8
Turbidity	NTU	Max	55	Daily Maximum	Monthly	Grab	EFF-3	See I.A.8

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/Min	Limit	Statistical Basis	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Nitrogen, Total (as N)	mg/L		Report Report	Daily Maximum Monthly Average	Monthly	Grab	EFF-3	
Nitrogen, Total (as N)	lb/yr	Max	365,000	Annual Total	Monthly	Grab	EFF-3	See.I.A.6
Nitrogen, Kjeldahl, Total (as N)	mg/L		Report	Daily Maximum	Monthly	Grab	EFF-3	
Phosphorus, Total (as P)	mg/L		Report Report	Daily Maximum Monthly Average	Monthly	Grab	EFF-3	
Phosphorus, Total (as P)	lb/yr	Max	73,000	Annual Total	Monthly	Grab	EFF-3	See I.A.6
Solids, Settleable	mL/L	Max	0.1	Daily Maximum	Monthly	Grab	EFF-3	
Nitrogen, Ammonia, Total (as N)	mg/L		Report	Daily Maximum	Quarterly	Grab	EFF-3	
Ammonia, Unionized (as NH3)	mg/L	Max	0.11	Daily Maximum	Quarterly	Calculated	CAL-1	See I.A.5 and I.A.8
Temperature (ºF), Water	Deg F		Report	Daily Maximum	Quarterly	Grab	EFF-3	See I.A.5
2,3,7,8-tetrachlorodibenzo-p-dioxin	pg/L	Max Max	0.014 0.014	Daily Maximum, Monthly Average	Quarterly	24-hr FPC	EFF-3	See I.A.4

Internal Outfall:

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/Min	Limit	Statistical Basis	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow	MGD	Max	Report	Daily Maximum	Quarterly	Flow Totalizer	OUI-4	
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	Max	10.0	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
2,3,7,8-tetrachlorodibenzo-furan (TCDF)	pg/L	Max	31.9	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
Chloroform	lb/day	Max Max	7.16 11.94	Monthly Average Daily Maximum	Once every 2 Months	24-hr Composite	OUI-4	See I.B.3 and I.B.4
Trichlorosyringol	µg/L	Max	2.5	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
3,4,5-trichlorocatechol	µg/L	Max	5.0	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
3,4,6-trichlorocatechol	µg/L	Max	5.0	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4

			Effluent Limitations		Monitoring Requirements			
Parameter	Units	Max/Min	Limit	Statistical Basis	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
3,4,5-trichloroguaiacol	µg/L	Max	2.5	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
3,4,6-trichloroguaiacol	µg/L	Max	2.5	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
4,5,6-trichloroguaiacol	µg/L	Max	2.5	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
2,4,5-trichlorophenol	µg/L	Max	2.5	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
2,4,6-trichlorophenol	µg/L	Max	2.5	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
Tetrachlorocatechol	µg/L	Max	5.0	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
Tetrachloroguaiacol	µg/L	Max	5.0	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
2,3,4,6-tetrachloro-phenol	µg/L	Max	2.5	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4
Pentachlorophenol	µg/L	Max	5.0	Daily Maximum	Quarterly	24-hr Composite	OUI-4	See I.B.4

PART I: Continued

Receiving Waters:	**Classification (indicate whether fresh or marine):**
St. Johns River	**Fresh water**

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):
In any routine or additional follow-up test for chronic whole effluent toxicity, the 25 percent inhibition concentration (IC25) shall not be less than 11.7% effluent. For acute whole effluent toxicity, the 96-hour LC50 shall not be less than 100% effluent in any test. Toxicity tests shall be conducted quarterly. For each routine test or additional follow-up test conducted, a total of three 24-hr flow proportion composite samples of final effluent shall be collected and used in accordance with the sampling protocol.

The first sample shall be used to initiate the test. The remaining two samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test. Samples for routine and additional follow-up tests shall not be collected on the same day.

Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five test dilutions: 100%, 55.9%, 11.7%, 5.7%, and 2.8% final effluent. The permittee shall conduct a daphnid, *Ceriodaphnia dubia*, Survival and Reproduction Test and a fathead minnow, *Pimephales promelas*, Larval Survival and Growth Test, concurrently. All test species, procedures and quality assurance criteria used shall be in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms**.**

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
None

Facility Mixing Zone Details (if applicable):
The effluent limitations for the parameters listed below ensure compliance with the applicable water quality criteria at the boundary of the mixing zones. For the parameters below, the discharge shall not cause or contribute to an exceedance of Class III fresh water quality criteria outside the described mixing zones. The length of the mixing zones is centered along either side and ends of the 1,043 foot diffuser structure. The permit includes mixing zones for the following water quality criteria:

Parameter	Mixing Zone Area	Mixing Zone Length
Ammonia (un-ionized)	11,570 sq. meters	16.5 meters*
Turbidity	11,570 sq. meters	16.5 meters*

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:

Date	Parameter and Units	Limit	Result
4/30/2014	Dissolved Oxygen (DO) (mg/L)	5.0	3.4
8/31/2014	Dissolved Oxygen (DO) (mg/L)	5.0	3.1

Describe previous FYI and WQBEL study:
The effluent was collected on September 12, 2012. The effluent AGP result was greater than the "problem" threshold for fresh receiving waters suggesting that nutrient enrichment may be an issue. The effluent's dissolved oxygen concentration (4.6mg/L) was below the minimum dissolved oxygen concentration criterion for Class III freshwater (≥ 5.0mg/L). Iron, TKN, TN, TSS, turbidity, color and hardness were within the permit limits. Arsenic, chromium III, nickel and zinc were detected between the MDL and PQL. Adsorbable Organic Halides (AOX) were detected in the effluent but because no flow data was collected, the limit could not be calculated. Due to the absence of a concurrent background conductivity value and problems with the field meter, the effluent conductivity for Class III freshwater could not be determined. No toxicity was analyzed.

Describe previous or current Enforcement Actions (including WLs):
Past enforcement actions occurred in 2007 for unauthorized discharge.

Describe any violations or problems noted in previous inspection:
None noted-in compliance

Discuss whether DMR trends within previous five years are improving or declining:
Facility was having issues with meeting the permitted DO limit. In 2015, no DO exceedances have been noted. A pH, fecal coliform, TSS and dioxin exceedance was also noted. The facility has been meeting the limit on the other parameters. Based on the reviewed DMRs, the trends appear to be somewhat improving.

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):
Since the outfall pipe was put into operations, meeting the DO requirements has not been problematic. The effluent discharging into the river is in accordance to permit.

PART II: Sampling Event Information

Date(s) sample collected:	**Sampler(s):**
Temperature (Deg C):	**pH (SU):**
Dissolved Oxygen (mg/L):	**Conductivity (umhos/cm):**
Total Residual Chlorine (mg/L):	**Total Residual Chlorine - after Disinfection (mg/L):**
Method of Chlorination:	**Method of De-chlorination:**

Flow During Sample Collection for each outfall(MGD):

Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):

Describe Discharge during Sampling Event:
☐ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**

Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:

Appendix B

Explanation of Measurements

(1) Quality Assurance and Quality Control

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.dep.state.fl.us/labs/library/lab_sops.htm and/or http://www.dep.state.fl.us/water/sas/sop/sops.htm.

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62-302.500(1)a and/or facility permit limits. A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedance of 62-302.530(6) and/or facility permit limits. Fecal coliform and enterococci results often are based on colony counts outside the acceptable range (B-qualifier). The dilutions performed on the sample did not yield results within the method acceptable range of 20- 60 colony forming units per plate. The B-qualifier does not affect data quality.

(5) Chlorophyll *a* Content

Chlorophyll *a* content is an estimate algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., and/or 62-302.530(47)(b), F.A.C..

(6) Algal Growth Potential (AGP)

The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. Raschke and Shultz (1987) found that an AGP above 10.0 mg dry weight/L represents a “problem” threshold for marine receiving waters, implying nutrient enrichment. High AGP values may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP in a low salinity sample under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of $\pm$ 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 10:1, nitrogen limitation of algal production is likely. When the N:P ratio is 20:1 or greater, phosphorus limitation is likely (EPA-822-B-00-002). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(61) F.A.C. Expected AGP is not calculated for marine samples incubated with *Dunaliella*.

(7) Definition of Qualifiers

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate
Z - Colonies were too numerous to count (TNTC)

Appendix C

Chemical analysis of effluent

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
4/6/2015 6:00	Georgia Pacific Final Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day	8.3	mg/L	0.2	2
4/6/2015 6:00	Georgia Pacific Final Effluent	Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC25	No Result	IC25		
4/6/2015 6:00	Georgia Pacific Final Effluent	Toxicology	Bioassay-Chron-Def-FW-Fish, IC25	No Result Q	IC25		
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Selenium	0.20 U	ug/L	0.2	0.8
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Cadmium	0.071 I	ug/L	0.05	0.2
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Copper	1.07	ug/L	0.5	1
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Chromium	1.9	ug/L	0.3	1.2
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Nickel	1.80	ug/L	0.25	1
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Arsenic	1.35	ug/L	0.25	1
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Silver	0.025 U	ug/L	0.025	0.1
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Lead	0.54 I	ug/L	0.2	0.8
4/6/2015 6:00	Georgia Pacific Final Effluent	Metals	Mercury	0.10 U	ug/L	0.1	0.5
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	TSS	4 I	mg/L	2	10
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	Ammonia-N	2.7	mg N/L	0.04	0.1
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	Total-P	0.68	mg P/L	0.005	0.05
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	Kjeldahl Nitrogen	5.2	mg N/L	0.8	2
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	NO2NO3-N	0.015	mg N/L	0.004	0.01
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	Temperature	24.0	C		
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	Sample Depth	0.2	m		
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	Dissolved Oxygen	2.02	mg/L		
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	Specific Conductance	1630	umhos/cm		
4/6/2015 6:00	Georgia Pacific Final Effluent	Nutrients	pH	7.56			
4/6/2015 10:20	Field Blank	Metals	Copper	0.50 U	ug/L	0.5	1
4/6/2015 10:20	Field Blank	Metals	Cadmium	0.050 U	ug/L	0.05	0.2
4/6/2015 10:20	Field Blank	Metals	Selenium	0.20 U	ug/L	0.2	0.8
4/6/2015 10:20	Field Blank	Metals	Nickel	0.25 U	ug/L	0.25	1
4/6/2015 10:20	Field Blank	Metals	Lead	0.20 U	ug/L	0.2	0.8
4/6/2015 10:20	Field Blank	Metals	Silver	0.025 U	ug/L	0.025	0.1
4/6/2015 10:20	Field Blank	Metals	Mercury	0.10 U	ug/L	0.1	0.5

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
4/6/2015 10:20	Field Blank	Metals	Chromium	0.30 U	ug/L	0.3	1.2
4/6/2015 10:20	Field Blank	Metals	Arsenic	0.25 U	ug/L	0.25	1
4/6/2015 10:20	Field Blank	Nutrients	Total-P	0.002 U	mg P/L	0.002	0.005
4/6/2015 10:20	Field Blank	Nutrients	NO2NO3-N	0.004 U	mg N/L	0.004	0.01
4/6/2015 10:20	Field Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2
4/6/2015 10:20	Field Blank	Nutrients	Ammonia-N	0.002 U	mg N/L	0.002	0.005
4/20/2015 6:00	Georgia Pacific Final Effluent	Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC25	No Result	IC25		
4/20/2015 6:00	Georgia Pacific Final Effluent	Toxicology	Bioassay-Chron-Def-FW-Fish, IC25	100 L	IC25		
4/20/2015 10:06	Georgia Pacific Final Effluent	Nutrients	Ammonia-N	2.4	mg N/L	0.1	0.25
4/20/2015 10:06	Georgia Pacific Final Effluent	Nutrients	pH	7.78			
4/20/2015 6:00	Georgia Pacific Final Effluent	Nutrients	Temperature	3.6	C		
4/20/2015 10:06	Georgia Pacific Final Effluent	Nutrients	Sample Depth	0.1	m		
4/20/2015 10:06	Georgia Pacific Final Effluent	Nutrients	Temperature	25.9	C		
4/20/2015 10:06	Georgia Pacific Final Effluent	Nutrients	Specific Conductance	1799	umhos/cm		
4/20/2015 10:06	Georgia Pacific Final Effluent	Nutrients	Dissolved Oxygen	0.48	mg/L		

EPA End Sheet

The Bioassay of Georgia - Pacific (Palatka Pulp & Paper) effluent sampled on April 6, 8, 20, 22 and 24, 2015. 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	11 12 15 04 06	18 **B**	19 **S**	20 2

Remarks

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The Priority Pollutants Analysis of Georgia - Pacific (Palatka Pulp & Paper) effluent sampled on April 6, 2015. 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	11 12 15 04 06	18 **X**	19 **S**	20 2

Remarks

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Biological Analyses of Georgia - Pacific (Palatka Pulp & Paper) effluent sampled on April 6, 2015. 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	11 12 15 04 06	18 **S**	19 **S**	20 2

Remarks

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