

TESTER ON: Jordan
 TESTER OFF

DATE ON 12-10-20

DATE OFF 12-15-20

PPM
 SS

DATE OFF	BOTTLE NO.	% CON.	I	F	DEP.	CORR	B.O.D.
		SEED	85	79	.6		
	A. 100	20ml	8.2	36	4.6	4.2	60.9
	B. 100	15ml	8.3	4.3	4.0	3.6	72.0
	C. 100	10ml	8.3	5.7	2.6	2.2	66.7

PH 8.18
 PH SM 8.08
 PH Range 7.94 - 8.34
 COD 12.5
 COD SM 12.5
 COD Range 97.5 - 148
 Tos 54.0
 Tos SM 53.5
 Tos Range 45.7 - 65.6
 Tot 43.15
 Tot SM 49.2
 Tot Range 41.0 - 57.0

PPM
 Bod

PPM
 SS

Bod 66.5
 Bod SM 76.8
 Bod Range 40.2 - 113

Time on - 10:10
 Time off - 8:49

P. = .40
 F. = .067

(66.5 Arg)

TESTER ON
 PPM Jordan
 Bod 1612

Tester off
 PPM Phillips
 SS

Date on
 2-25-21
 Date off
 3-02-21

DATE OFF	BOTTLE NO.	% SOL.	I	F	SEC	CORR	B.O.D.
	1	5.250	8.3	7.7	1.6		
	A ^{.069}	2ml	8.0	3.2	4.8	4.4	63.8
	B ^{.050}	15ml	8.1	4.3	3.8	3.4	68.0
	C ^{.033}	10ml	8.2	5.6	2.6	2.2	66.7

Bod 1612
 Bod Act 76.8
 Bod Range 70.2-113

Time on
 9:03
 Time off
 8:44

P .40
 F .067

PH 8.12
 PH - S.M. 8.08
 PH Range 7.94-8.34

Toc 43.34
 Toc Act 49.2
 Toc Range 41.0-57.0

TSS 62.6
 TSS Act 64.8
 TSS Range 53.5 - 75.0

Cod 141
 Cod Act 125
 Cod Range 97.5-198

Tester on: Jordan + Phillips

Tester off: Phillips

Date on 3-18-21

Date off 3-23-21

1.49
1.58

PH 7.22

PH Act 7.27

PH Range 6.98-7.39

COD 141

COD Act. 125

COD Range 97.5-148

TSS 45.8

TSS Act 45.4

TSS Range 39.2-52.8

TOC 42.72

TOC Act 49.2

TOC Range 41.0-57.0

Time on 8:11

Time off 8:05

BOD 64.7

PPM
SS

BOD 64.7

BOD Act. 76.8

BOD Range 40.8-113

DATE OFF	BOTTLE NO.	% CON. SEED	I	F	REP.	CORP.	B.O.D.
			8.0	7.2	1.8		
	A 10.69	20 ml	7.8	2.9	4.9	4.58	66.4
	B 10.50	15 ml	7.8	4.4	3.4	3.08	61.6
	C 10.33	10 ml	7.9	5.4	2.5	2.18	66.1

2 seed

P. .32

F. .040

PPM
Bod

PPM
SS

Tester on - Phillips

Time on 8:50

Time off 9:15

BOD 31.0

BOD Act. 39.0

BOD Range 19.9-58.1

P - .28

F - .040

DATE OFF	BOTTLE NO.	% CON.	2 Seed		DEP.	CORR.	B.O.D.
			I	F			
		SEED	8.4	7.7	.7		
	.100 A	30ml	8.1	4.8	3.3	3.02	30.2
	.067 B	20ml	8.2	6.2	2.0	1.72	25.7
	.033 C	10ml	8.3	6.8	1.5	1.22	37.0

Tester off Phillips

Date on 4-22-21

Date off 4-27-21

PH 7.28

PH Act. 7.27

PH range 6.98-7.38

TSS 44.2

TSS Act. 45.4

TSS Range 39.2-57.8

TOC 20.06

TOC Act. 24.8

TOC Range 20.2-29.4

COD 73

COD Act. 62.8

COD Range 44.3-78.7

Tester on: Phillips

Tester off: Lewis

BOD

PH
SS

DATE OFF	BOTTLE NO.	% CON.	I	F	DEP.	CORR.	B.O.D.
	2 seed	SEED	8.4	7.6	.8		
	A	30 ml	8.0	4.2	3.8	3.48	34.8
	B	20 ml	8.1	5.7	2.4	2.08	31.0
	C	10 ml	8.2	6.8	1.4	1.08	32.7

Date on
5-20-21

Date off
5-25-21

Time on
8:35

Time off
8:42

BOD 32.8

BOD Act, 39.0

BOD Range 19.9-58.1

F. .040

P. .32

PH 8.07

PH Act, 8.08

PH range 7.94-8.34

(5-21-21)
TOC 26.05

TOC Act, 24.8

TOC range 20.2-29.4

COD 54

COD Act 62.8

COD range 44.3-78.7

TSS 68.4

TSS Act 66.5

TSS range 56.7-78.8

Tester on/off
Phillips

DMRQA
PEI - 026
PEI - 035
PEI - 079

PH 7.65
PH Range 5.0 - 10

TOC 16.63
TOC Range 6.0 - 100mg

TSS 60
TSS Range 20 - 100 mg

COD 56
COD Range 30 - 250 mg

PPM
BOD

PPM
SS

BOD 32.6
BOD range 18 - 280

P .27
F .067
Time on 9:08
Time off 8:45

DATE OFF	BOTTLE NO.	% CON. SEED	I	F	DEP.	CORR	B.O.D.
	35000		8.5	8.1	.4		
1069	A	20ml	8.4	6.0	2.4	2.13	30.9
1050	B	15ml	8.4	6.5	1.9	1.63	32.6
1033	C	10ml	8.4	7.0	1.4	1.13	34.2

Date on 5-13-21
Date off 5-18-21

D
J
7
7
B
B
B
F
F

CWA - Non-Potable Water
FINAL Performance Evaluation Report
NSI Laboratory Proficiency Testing Program
Study DMRQA-40 - Shipped: 03/20/2020 - Closed: 09/18/2020 - Reports Printed On: 09/23/2020
Participant USEPA Labcode: AR00936

Study Designed and Coordinated by:
NSI Lab Solutions
7212 ACC Blvd., Raleigh, NC 27617
ANAB Certificate#: AP-1693-1
1-800-234-7837

This evaluation report is being submitted to:

Georgia-Pacific, Crossett Paper
Attention: Rachel Johnson
PO Box 3333
Crossett, AR, 71635

LabCode and Accreditation Information:

Send Results to: State and EPA
EPA Lab Code: AR00936
State Lab Code:
Primary Agency: AR -- Arkansas DEQPenny Semberski
Add'l Agencies below 5301 Northshore Drive
North Little Rock, AR, 72118-5317
Reports to: AR
EPA Region VI

Participant Information

NSI Lab Code: N08505
Permittee Code: AR0001210

This report was submitted by Rachel Johnson, Environmental Engineer

Georgia-Pacific, Crossett Paper
PO Box 3333
Crossett, AR, 71635
870-567-8170

Please contact Mark Hammersla at NSI Lab Solutions if you have any questions about this report.
(800) 234-7837 - mark.hammersla@nsilabsolutions.com

This PT report may contain data not covered under ANAB Accreditation. Such data is noted by an asterisk.

PEI-026 Demand - Georgia-Pacific, Crossett Paper - NSI Lab Solutions/DMRQA-40

NELAC Analyte	NELAC Method Code	Method Description	Reported Value	Study Mean	Assigned Value	Units	Standard Deviation	EPA Code ¹	Acceptance Limits	Evaluation	Analysis Date	Analyst's Name
1530 BOD	20134605	SM 5210 B	50.3	53.1	52.6	mg/L	16.6	AR00936	27.4 to 77.7	ACCEPT.	5/21/20	P. Jordan
1565 COD	20136203	SM 5220 D	85.0	82.6	85.1	mg/L	14.1	AR00936	63.4 to 104	ACCEPT.	5/21/20	P. Jordan
2040 TOC	20137206	SM 5310 B	29.4	34.1	33.6	mg/L	2.05	AR00936	27.7 to 39.3	ACCEPT.	5/21/20	P. Jordan
1555 CBOD	-- Not Reported --											

PEI-035 pH - Georgia-Pacific, Crossett Paper - NSI Lab Solutions/DMRQA-40

NELAC Analyte	NELAC Method Code	Method Description	Reported Value	Study Mean	Assigned Value	Units	Standard Deviation	EPA Code ¹	Acceptance Limits	Evaluation	Analysis Date	Analyst's Name
1900 pH	20104603	SM 4500-H+ B	8.14	8.07	8.14	units	0.239	AR00936	7.94 to 8.34	ACCEPT.	5/21/20	P. Jordan

PEI-079 Residue - Georgia-Pacific, Crossett Paper - NSI Lab Solutions/DMRQA-40

NELAC Analyte	NELAC Method Code	Method Description	Reported Value	Study Mean	Assigned Value	Units	Standard Deviation	EPA Code ¹	Acceptance Limits	Evaluation	Analysis Date	Analyst's Name
1960 Non-Filterable Residue (TSS)	20050606	SM 2540 D	53.8	61.9	66.5	mg/L	5.77	AR00936	53.3 to 74.8	ACCEPT.	5/21/20	P. Jordan
1950 Total Solids	-- Not Reported --											

Assigned Values

All assigned values are established in a manner compliant with the current NELAC FOT for Non-Potable Water. With the exception of TDS and Specific Conductance assigned values are equal to the analytically verified gravimetric true value of the PT sample. For TDS and Specific Conductance, the assigned value is set at the robust study mean.

Accuracy/Traceability/Uncertainty

All assigned values are analytically verified for formulation accuracy prior to shipment. A total of 10 randomly chosen samples are taken from the production run and analyzed against NIST SRMs or CRMs. Traceability to SI is established through microbalance calibration with NIST traceable test masses. The expanded uncertainty at 95% CI with K=2 of each assigned value is available upon request and is typically <0.50%.

Batch Homogeneity

Each individual PT sample batch is thoroughly mixed in production and guaranteed to be homogeneous. Homogeneity is verified analytically according to in-house SOP.

Stability

Each analyte has been verified stable through the end of the PT study by either long term monitoring or study closing stability testing.

Acceptance Limits

Acceptance limits are set according to current NELAC limits. Where no limits are set by NELAC, limits are set to ± 3 standard deviations around the study mean after outlier correction.


Accredited Analytes

All analytes are included under our ISO 17043/TNI scope of accreditation (Certificate #: AP-1693-1) unless otherwise noted with an asterisk (*).

PT Study Summary

To view a summary of the PT study results, please see Study Summary Report available in our PT Datalink at www.nsilabsolutions.com.

* The study mean and standard deviation are presented after outlier correction and are based upon pooled reported results without consideration for analytical technology. If present, the EPA Code of the lab that actually performed the analysis for this analyte.

Reviewed/Approved By: 
Mark Hammersla, President

Date: 09/23/2020

Add'l Agencies: EPA Region VI -- EPA Region VI (6EN-WC)
Magda Dallemagne
1445 Ross Avenue Special Projects Section (6EN-WS)
Dallas, TX 75202

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STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of 5-Day BOD (Biochemical Oxygen Demand)	ISSUE DATE 1/31/2012	METHOD 5210 B
APPROVED BY Rachel Johnson	REV. DATE 1/20/2014	PAGE 1 of 6
PURPOSE To measure the biochemical oxygen demand or BOD in a given water sample.		

SCOPE

The BOD test is performed to determine the presence of organic pollutants. The result of the test indicates the amount of dissolved oxygen used up in a sample, giving a measure of organic material present. The sample is collected and incubated in an air-tight bottle for five (5) days at 20° C. Dissolved oxygen is measured initially and after incubation. BOD is computed from the difference between initial and final DO. A BOD5 analysis is required by NPDES permit AR0001210 at Outfall 001 (E2) and at SMS 002 (E3) at a minimum of three (3) times per week.

APPARATUS

Clean BOD bottles with stoppers and plastic covers

Incubator controlled at 20° C +/- 1° C, with NIST traceable thermometer and excluding all light.

Pipettes and graduated cylinders

Dissolved Oxygen (DO) meter

pH meter

Carboy for dilution water

Thermometers

Stir plate with stir bars

Composite sampler and refrigerator

REAGENTS

Polyseed capsule

BOD Standard Solution

De-Ionized (DI) Water

BOD Dilution Water: Add 190 mL of Phosphate buffer, 190 mL of Magnesium Sulfate solution, 190 mL of Ferric Chloride solution and Calcium Chloride solution to 55 gallons of DI Water.

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of 5-Day BOD (Biochemical Oxygen Demand)	ISSUE DATE 1/31/2012	METHOD 5210 B
APPROVED BY Rachel Johnson	REV. DATE 1/20/2014	PAGE 2 of 6
PURPOSE To measure the biochemical oxygen demand or BOD in a given water sample.		

Saturate with oxygen by aerating for 15 minutes with organic-free filtered air. Let the dilution water stand overnight. The water is deemed good as long as the nutrient water blanks show less than 0.2 mg/L do depletion in 5 days.

BOD Seed Water: Place entire contents of one Polyseed capsule into 500 mL of dilution water. Add a stirrer bar and saturate with oxygen by aerating for one hour. Let settle for 10-15 minutes.

Check Solution Standard or Glucose-Glutamic Acid solution (GGA) – This is a commercially prepared solution. Follow manufacturer’s instructions for use as they are subject to change.

PROCEDURE

Sample Collection

Composite Samples – Keep samples at or below 6°C during compositing. Rinse the sample container with a portion of the collected sample. Transfer the needed volume from the composite sampler into a clean sample container. Cap and return the sample container to the lab. Samples should be collected and analyzed on the following frequency:

Sample	Frequency
E2	3 times per week
E3	3 times per week
QA/QC	1 test per month
DMRQA	1 test per year

Sample Storage and Holding Time

Cold storage is not necessary if BOD analysis is begun within two (2) hours of sample collection. If analysis is not started within two (2) hours, the sample should be kept at or below 6°C. Hold time for the sample is 48 hours from collection time.

Pre-Treatment of Samples

If sample contains caustic alkalinity (pH>8.5) or acidity (pH<6.0) bring sample to 20° C +/- 1°C, and neutralize to 6.5 – 7.5 pH using 1N sodium hydroxide and/or 1N sulfuric acid.

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of 5-Day BOD (Biochemical Oxygen Demand)	ISSUE DATE 1/31/2012	METHOD 5210 B
APPROVED BY Rachel Johnson	REV. DATE 1/20/2014	PAGE 3 of 6
PURPOSE To measure the biochemical oxygen demand or BOD in a given water sample.		

Confirmation of Incubator Temperature

Read the thermometer in the incubator and record. Reset the incubator temperature if it is outside the range of 20° C +/- 1°C.

Setup and Incubation of BOD Samples

1. Dilution Water Blank:
 - a. Fill a BOD bottle with dilution water. Fill bottle with an amount of dilution water sufficient to prevent an air bubble from forming in the bottle when the stopper is inserted.
 - b. Place bottle in incubator until temperature is at 20° C +/- 1°C.
 - c. Use the membrane electrode to determine initial DO in the bottle.
 - d. Record bottle number and initial DO value.
 - e. Replace any bottle contents displaced by electrode measurement with dilution water.
 - f. Stopper the bottle tightly. Water-seal cap and place in incubator.
2. Seed Water Sample:
 - a. Setup BOD bottles 1, 2, and 3.
 - b. Fill BOD bottles half full with dilution water.
 - c. Pipette 3mL, 5mL, and 8mL of seed water into bottles 1, 2, and 3.
 - d. Finish filling BOD bottles with dilution water.
 - e. Determine the DO, and whichever is between 0.6 – 1.0 is the one used to determine factor for BOD's.
3. BOD of Check Solution Standard:
 - a. Fill a BOD bottles half full with dilution water and 3mL of seed water.
 - b. Shake the check solution and snip off top.
 - c. Pour check solution into the bottle and finish filling with dilution water.
 - d. Record lot number and stock number.
 - e. Determine the initial DO and record results.
 - f. Stopper bottle tightly. Water-seal cap and place in the incubator.
4. BOD of E2 & E3 Samples:
 - a. Bring samples to 20° C +/- 1°C before making dilution.
 - b. Shake the sample container.

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of 5-Day BOD (Biochemical Oxygen Demand)	ISSUE DATE 1/31/2012	METHOD 5210 B
APPROVED BY Rachel Johnson	REV. DATE 1/20/2014	PAGE 4 of 6
PURPOSE To measure the biochemical oxygen demand or BOD in a given water sample.		

- c. Set up (3) BOD bottles for each sample.
 - d. Pour 150mL, 110mL and 80mL portions of the E2 sample, into 1000mL flasks A, B, and C. For E3 use 450mL, 250mL, and 150mL portions. (Portions may vary due to strong or weak samples.*)
 - e. Finish filling the flasks up with dilution water and pour them in 1000mL beakers.
 - f. Siphon into BOD bottles 8, 9, and 10 for E2 samples and BOD bottles 11, 12, and 13 for E3 samples.
 - g. Determine initial DO, and record results.
 - h. Stopper bottles tightly. Water-seal cap and place in the incubator.
5. BOD of Non-Regulatory Samples:
- a. Fill BOD bottles half full with dilution water.
 - b. Transfer 6mL, 4mL, and 3mL of E1 sample into BOD bottles 5, 6, and 7.
 - c. Transfer 2mL of seed water into the bottles.
 - d. Finish filling the BOD bottles with dilution water. Determine initial DO, and record results.
 - e. Stopper bottles tightly. Water-seal cap and place in the incubator.
6. Incubator Take Out:
- a. After five (5) days of incubation (+/- 4 hours), remove BOD bottles from incubator.
 - b. Measure and Record final DO.
 - c. Calculate and Record BOD.

*Dilution Technique for samples: Dilution that result in a residual DO of at least 1.0 mg/L and a DO uptake of a least 2.0 mg/L after five days of incubation produce the most reliable results and are a requirement for an acceptable test. Use previous data, along with TSS, BOD1, TOC or COD data to determine necessary dilutions. If unsure, more than three dilutions per sample may be used.

CALCULATIONS FOR SAMPLES

Where D1 = Initial DO of diluted sample, mg/L

D2 = DO of diluted sample after incubation, mg/L

DF = Dilution Factor, 300 mL total in bottle / mL of sample used

S = Oxygen uptake of seed per milliliter, ΔDO/mL seed suspension added per bottle

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of 5-Day BOD (Biochemical Oxygen Demand)	ISSUE DATE 1/31/2012	METHOD 5210 B
APPROVED BY Rachel Johnson	REV. DATE 1/20/2014	PAGE 5 of 6
PURPOSE To measure the biochemical oxygen demand or BOD in a given water sample.		

$S = 0$ if samples are not seeded

$S = (D1-D2)/mLs$ seed in seeded control

V_s = Volume of seed in the respective test bottles, mL

Unseeded Controls:

DO depletion (mg/L) = $D1 - D2$

Unseeded controls should be less than or equal to 0.2 mg/L depletion.

Seeded Controls:

If variable volumes were used for seed controls, then

Seed Correction Factor, SCF (mg/L) = $(S) V_s$

Average all seeded control depletions per milliliter of seed (S) and multiply this average by the number of milliliters of seed that was used in the samples (V_s).

Samples and GGA:

BOD₅, mg/L = $[(D1 - D2) - SCF] * DF$

Or for unseeded samples

BOD₅, mg/L = $(D1 - D2) * DF$

DATA REPORTING AND QUALITY ASSURANCE

1. Report seed correction factor to the nearest tenth.
2. Report BOD results to the nearest tenth.
3. If more than one sample dilution meets the criteria of a residual DO of 1 mg/L and a DO depletion of a least 2 mg/L average results in the acceptable range for reporting. If only one dilution meets the criteria of a residual DO of 1 mg/L and a DO depletion of 2 mg/L and other dilution do not meet these criteria, use the one dilution that meets the criteria.

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of 5-Day BOD (Biochemical Oxygen Demand)	ISSUE DATE 1/31/2012	METHOD 5210 B
APPROVED BY Rachel Johnson	REV. DATE 1/20/2014	PAGE 6 of 6
PURPOSE To measure the biochemical oxygen demand or BOD in a given water sample.		

4. Test replicates should not exceed 30% difference between the maximum and minimum values.
5. GGA should be 198.0 +/- 30.5 mg/L.

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE PH Determination of Grab Samples	ISSUE DATE 1/31/2012	METHOD 4500 – H+
APPROVED BY Rachel Johnson	REV. DATE 4/28/2020	PAGE 1 of 2
PURPOSE To provide guidance in the determination of pH using the Orion Star portable pH meter available to the laboratory technicians.		

SCOPE

The pH of a sample is determined electrometrically using either a glass electrode in combination with a reference potential or a combination electrode.

APPARATUS

pH meter, Orion Star portable

Combination electrode or glass electrode and reference electrode

Beakers

REAGENTS

Standard buffers: pH 7, pH 10 and pH 4 (Expiration dates should be on the buffers and must be discarded on the expiration dates)

De-Ionized (DI) Water

PROCEDURE

Calibration

1. Turn on the Orion Star pH meter.
2. Place 4.00, 7.00 and 10.00 buffer solutions into three small beakers.
3. In the measurement mode, press f1(cal).
4. Rinse the pH electrode with distilled water, blot dry with a lint-free tissue and place in the 10.00 pH buffer.
5. When the electrode and buffer are ready, press f3 (start).
6. Wait for the pH value on the meter to stabilize and stop flashing. Press f2 (accept) to accept the displayed pH value.
7. Press f2 (next) to proceed to the next buffer. Press f1 (cal).
8. Rinse the pH electrode with distilled water, blot dry with a lint-free tissue and place in the 4.00 pH buffer.
9. When the electrode and buffer are ready, press f3 (start).

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE PH Determination of Grab Samples	ISSUE DATE 1/31/2012	METHOD 4500 – H+
APPROVED BY Rachel Johnson	REV. DATE 4/28/2020	PAGE 2 of 2
PURPOSE To provide guidance in the determination of pH using the Orion Star portable pH meter available to the laboratory technicians.		

10. Wait for the pH value on the meter to stabilize and stop flashing. Press f2 (accept) to accept the displayed pH value.
11. Press f2 (next to proceed to the next buffer. Press f1 (cal).
12. Rinse the pH electrode with distilled water, blot dry with a lint-free tissue and place in the 7.00 pH buffer.
13. When the electrode and buffer are ready, press f3 (start).
14. Wait for the pH value on the meter to stabilize and stop flashing. Press f2 (accept to accept the displayed pH value.
15. Press f3 (cal done) to save and end the calibration.
16. Rinse and leave probe in DI water until ready to use.

Sample Collection and Holding Time

The pH is performed on a grab sample of the permitted sample point and it must be performed within 15 minutes of sample collection. If sample holding time is exceeded another sample should be obtained.

Measurement of Sample pH

1. Rinse electrode with DI water and blot dry with a lint free tissue.
2. Place approximately 100mL of sample in a beaker.
3. Immerse electrode into sample. Read and record sample pH.
4. Rinse probe off in DI water in between each sample.

DATA REPORTING AND QUALITY ASSURANCE

1. Report results in Standard Units (SU) to the nearest tenth.
2. Grab samples are analyzed at a minimum of three (3) times per week at Outfall 001 (E2) and SMS 002 (E3).
3. Duplicate samples are collected and analyzed once per week at all sample locations. Duplicate results should not be more than 0.1 units apart.

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of Total Suspended Solids (TSS)	ISSUE DATE 1/31/2012	METHOD 2540D
APPROVED BY Rachel Johnson	REV. DATE 1/28/2014	PAGE 1 of 3
PURPOSE To provide guidance for identifying Total Suspended Solids		

SCOPE

TSS is a common analysis to be performed to determine the volume of particulate matter being carried in fluids. The principle is to take a well-mixed sample and filter it through a standardized filter. The suspended solids in the liquid may then be determined by the weight of the solids left on the filter.

SAFETY CONSIDERATIONS FOR TESTING

Those performing this procedure should read and become familiar with the SDS (Safety Data Sheet) associated with this procedure, if applicable. SDS's are available through the Crossett Intranet Website and at the control rooms.

Reagents

- ▶ Reagent grade Water
- ▶ Wastewater Samples

First aid measures:

- ▶ Eye Contact: Flush with water for 15 minutes.
- ▶ Skin Contact: If on skin or hair remove any contaminated clothing and wash with soap and water, launder or dry-clean clothing before reuse.
- ▶ Ingestion: Do not induce vomiting. If spontaneous vomiting is about to occur, place victim's head below knees.

After first aid, immediately get appropriate Mill support by calling (x8448 for emergency or x8406 for support).

Personal Protective Equipment that may be required to perform this procedure:

- ▶ Safety glasses with top and side shields
- ▶ Disposable latex gloves
- ▶ Steel toe shoes

APPARATUS

- ▶ Fiber filter discs
- ▶ Vacuum filter holder
- ▶ Weighing pan
- ▶ Graduated cylinder
- ▶ Suction Flask
- ▶ Drying oven for operations at 103-105°C

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of total Suspended Solids (TSS)	ISSUE DATE 1/31/2012	METHOD 2540D
APPROVED BY Rachel Johnson	REV. DATE 1/28/2014	PAGE 2 of 3
PURPOSE To provide guidance for identifying Total Suspended Solids		

- ▶ Desiccator containing dry-indicating Drierite (blue when dry, pink when moist)
- ▶ Analytical balance capable of weighing to 0.1 mg
- ▶ Magnetic stirrer with TFE stirring bar
- ▶ Wide-bore pipets
- ▶ Filter funnel
- ▶ Beakers

PROCEDURE

Sample Collection

Samples should be collected from the composite sampler on the following frequency. All samples must be analyzed with 7 days. Samples are to be kept cooled and brought to room temperature before being analyzed.

Sample	Frequency
E2	3 times per week
E3*	3 times per week
QA/QC	1 test per month
DMRQA	1 test per year

*When Mossy Lake is not flooded.

Preparation of Filters

1. Read the thermometer in the drying oven and record the temperature daily. Reset the oven temperature if it is outside the range of 103°-105°C.
2. Place a glass fiber filter disc (wrinkled side up, patterned side down) in the filter holder mounted on the suction flask.
3. Apply a vacuum and wash filter with three (3) 20mL portions of reagent grade water. Continue suction to remove all traces of water. Discard washings.
4. Carefully remove the filter disc from the filter holder. Place in pan and dry in the oven for at least one (1) hour.
5. Remove pan containing the filter from the oven. Place in the desiccator for 20 to 30 minutes to cool.
6. Weigh the filter and record the weight.
7. Repeat steps 4-6 until constant weight is obtained or until the weight change is less than 4% or 0.5 mg of the previous weighing, whichever is less. Record all weights.
8. Store the filter in the desiccator until it is needed.

STANDARD OPERATING PROCEDURES

Georgia Pacific LLC – Crossett Paper Operations		
TITLE Determination of total Suspended Solids (TSS)	ISSUE DATE 1/31/2012	METHOD 2540D
APPROVED BY Rachel Johnson	REV. DATE 1/28/2014	PAGE 3 of 3
PURPOSE To provide guidance for identifying Total Suspended Solids		

Sample Analysis

9. Remove a filter from the desiccator and place in the filter holder on the suction flask. Begin suction and wet the filter with a small volume of reagent grade water to seal it.
10. Mix the sample thoroughly using the magnetic stirrer.
11. Pipet 100 mL on E3 and 50 mL on E2 from the approximate midpoint of the container through the filter.
Note: If filtration time exceeds 10 minutes begin the test again with a new filter and use a smaller volume of sample. (Selected sample volume should yield between 2.5 and 200 mg dried residue.)
12. Wash filter with three successive 10 mL volumes of reagent grade water, allowing complete drainage between washings. Continue suction for about 3 minutes after filtration is complete.
13. Carefully remove the filter disc from the holder and transfer to an aluminum dish to dry in the oven for at least one (1) hour.
14. Remove the filter from the oven. Cool in the desiccator for at least 20 to 30 minutes.
15. Weigh the filter and record the weight. Return the filter to the oven.
16. Repeat steps 14-16 until a constant weight is obtained or until the weight change is less than 4% or 0.5 mg of the previous weighing, whichever is less. Record all weights.
17. Perform Outfall Sample Analysis in triplicate.
18. One a month, analyze a 100 mL portion of Alpha-trol standard (TSS = 80 mg/L)
19. Calculate TSS and record results on worksheet. Sign the worksheet.

Calculation

TSS, mg/L = $(A-B) \times 1000 / \text{Sample Volume, mL}$

Where A = weight of the filter and dried residue, mg

B = weight of filter, mg