

Baxter Wastewater Treatment Plant
NPDES Number: TN0021121
Site Tracking Number: TNB021121
Annual Biosolids Report
for
Wastewater Solids Land Applied in 2020
February 1, 2021

ANNUAL REPORT

Biosolids Generated- General Information

- a. Total Biosolids Land Applied in 2020: 13.5 Dry Metric Tons
- b. Concentration of Metals: See attached lab report.
- c. PCB Report Date: January 15, 2019
- d. TCLP Report Date: January 15, 2019
- e. Pathogen Reduction Process Description and Results: Pathogen reduction has been demonstrated by fecal coliform testing. The geometric mean of the density of fecal coliform in ten samples collected was 1,430. These results meet the requirements in Appendix C of the Biosolids Permit, Class B-Alternative 1. A sample bench sheet of the most recent fecal coliform test is attached for your inspection.
- f. Vector Attraction Reduction Description and Results: Vector attraction reduction has been demonstrated by specific oxygen uptake rate (SOUR) testing. The average of six SOUR test results demonstrates an oxygen uptake rate of .497 mg O₂/hr/g @ 20 degrees Celcius. These results meet the requirements in section 3.1.3.(d) of the Biosolids Permit. A sample bench sheet of the most recent SOUR test is attached for your inspection.
 - g. Generator Certification Statement: Under penalty of law I certify that the information that will be used to determine compliance with the Class B pathogen requirements in Appendix C and the vector attraction reduction requirements in Section 3.1.3(d) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

Application Sites (complete this section for each site or field)

- a. Site Name: Thomas Lee Young Site
- b. Site Owner: City of Baxter, TN
- c. Site Operator: City of Baxter, TN
- d. Applier: City of Baxter, TN
- e. Latitude and Longitude of Site: 36.145556 and 85.644167
- f. Street Address: 810 Elmore Town Road Baxter, TN 38544
- g. County: Putnam
- h. Size (acres).

1. Approved Acres: 20 acres
2. Applied Acres: 20 acres
- i. Acres excluding setbacks: 20 acres
- j. Crop Information.
 1. Crop Grown: perennial grass for hay
 2. Yield: about one ton per acre per cutting
- k. Application Method: liquid spreader truck
- l. Agronomic Rate (tons/acre) and if applicable, the cumulative loadings for each contaminant.
 1. Agronomic Loading Rate: 3.30 Dry T/Acre
 2. Maximum Plant Available Nitrogen (PAN) loading: 120 lbs. N/Acre
 3. Loading Rate to achieve PAN: 3.30 Dry T/Acre
 4. Actual application volume wet: 207,000 gallons
 5. Actual application tonnage , dry: .675 Dry T/Acre
 6. Total wet volume per field: 207,000 gallons
 7. Total dry tons per field: 13.5 Tons
- m. Nitrogen Concentrations. Report average and maximum test concentrations
 1. Average Ammonia: 43.18 Maximum: 43.18
 2. Average TKN: 48,566 mg/Kg Maximum: 48,566 mg/Kg
 3. Average Organic Nitrogen: 50,873 mg/Kg Maximum: 50,873 mg/Kg
 4. Average Nitrate: 2,307 mg/Kg Maximum: 2,307 mg/Kg
 5. Total Solids Percent: 71.55%
- n. Tonnage Applied
 1. Biosolids Applied to Site
 - i. Total Tonnage or Volume: 207,000 gallons
 - ii. Dry tons: 13.5 Tons
 2. Biosolids Applied to Each Site
 - i. First Application Date: March 30, 2020
 - ii. Last Application Date: November 18, 2020
- o. Metals See attached Lab Report
- p. Management Practices. (Describe how each item below is met)
 1. Set Backs: The land application of biosolids will be conducted in a manner that will not cause a violation of any receiving water quality standard from discharges of surface runoff from the land application site. There are no wetlands, seasonal surface water bodies, sink holes, wells, or biosolids storage areas on this site. The only perennial surface water body near the application site is Mine Lick Creek; this creek is located about 100 yards from the nearest land application location.
 2. Agronomic Loading: Application of biosolids will be conducted in a manner that does not exceed the agronomic loading rate for available nitrogen of the crops grown on the site. The facility will provide written notification to the biosolids applier of the concentration of total nitrogen (as N on a dry weight basis) in the biosolids.
 3. Weather Restrictions: Biosolids will not be applied to frozen, ice covered, or snow covered sites. When weather and/or soil conditions prevent adherence to

the biosolids application procedures, biosolids will not be applied on the site.

4. **Soil Restrictions:** There is no standing surface water on the application site and the groundwater level does not reach the surface of the land application site. The land application site is not subject to flooding.
5. **Threatened and Endangered Species:** The biosolids or the application of the biosolids will not cause or contribute to the harm of a threatened or endangered species or result in the destruction or adverse modification of critical habitat of a threatened or endangered species after application.
6. **Metals Loading:** Biosolids subject to the cumulative contaminant loading rate in Table 2 (subsection 3.1.1.2) will not be land applied if any of the cumulative contaminant loading rates in Table 2 have been reached.
7. **Notification of Owners:** The permittee will provide notice and necessary information to the person who land applies the biosolids and the owner or lease holder of the land on which the biosolids are applied.

Site Restrictions: No food crops are grown on the land application site. Hay will not be harvested from the site for 30 days after application. The public has no access to the site. Animals do not graze on the application site.

- a. Certification Statement: Under penalty of law I certify that the information that will be used to determine compliance with the management practices in Section 3.2 was prepared for each site on which bulk biosolids were applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.
- b. Certification Statement: Under penalty of law I certify that the information that will be used to determine compliance with the site restrictions in Section 3.1.2.3 for each site on which Class B biosolids were applied was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

Tony Wu
Chief WWTP operator
2-1-21



BACKGROUND INFORMATION/QUESTIONS

FILL IN BELOW

WWTP NAME	Baxter WWTP
WWTP NPDES PERMIT NUMBER	TN0021121
SITE NAME	Thomas Lee Young
COUNTY	PUTNAM
E.A.C.	
SITE TRACKING NUMBER	TNB021121
LABORATORY NAME	Nationwide Analytical Laboratories
DATE OF ANALYSIS	2/5/20

SLUDGE/BIOSOLID ANALYSIS LABORATORY RESULTS

(Attached a copy of the laboratory analysis used for these calculations to this report)

TOTAL KJELDAHL NITROGEN (TKN)	48,566	mg/kg
AMMONIUM NITROGEN (NH ₄ -N)		mg/kg
NITRATE + NITRITE NITROGEN (NO ₃ -N + NO ₂ -N)	2,307	mg/kg
NITROGEN FROM SUPPLEMENTAL FERTILIZERS (If Appropriate)	0	lbs/acre
NITROGEN FROM IRRIGATION WATER (If Appropriate)	0	lbs/acre
NITROGEN FROM PREVIOUS CROP (Unless 2 is based on soil testing)	0	lbs/acre
OTHER (If Appropriate) Specify _____	0	lbs/acre

SELECT CROP TYPE

(SELECT ONLY ONE)

YES

1 - CORN (GRAIN) EXPECT YIELD 100 - 125 BUSHELS	<input type="checkbox"/>
2 - CORN (GRAIN) EXPECT YIELD 126 - 150 BUSHELS	<input type="checkbox"/>
3 - CORN (SILAGE) EXPECT YIELD 20 TONS	<input type="checkbox"/>
4 - SOYBEANS EXPECT YIELD 30 BUSHELS	<input type="checkbox"/>
5 - SOYBEANS EXPECT YIELD 40 BUSHELS	<input type="checkbox"/>
6 - SOYBEANS EXPECT YIELD 50 BUSHELS	<input type="checkbox"/>
7 - WHEAT EXPECT YIELD 40 BUSHELS	<input type="checkbox"/>
8 - SUMMER ANNUAL GRASS EXPECT YIELD 6 TONS (1 CUTTINGS)	<input type="checkbox"/>
9 - HYBRID HAY EXPECT YIELD 8 TONS (4 CUTTINGS)	<input type="checkbox"/>
10 - TALL FESCUE HAY EXPECT YIELD 3 TONS (2 CUTTINGS)	<input checked="" type="checkbox"/>
11 - ORCHARD GRASS HAY EXPECT YIELD 4 TONS (2 CUTTINGS)	<input type="checkbox"/>
12 - SORGHUM (GRAIN) EXPECT YIELD 60 BUSHELS	<input type="checkbox"/>
13 - COTTON EXPECT YIELD 1 BALE / ACRE	<input type="checkbox"/>
14 - COTTON EXPECT YIELD 1.5 BALE / ACRE	<input type="checkbox"/>

CROP TYPE (LBS N/ACRE/YEAR)

120

VOLATILIZATION FACTORS K_v

(SELECT ONLY ONE)

- 1 - ARE BIOSOLIDS LIQUID AND SURFACE APPLIED?
2 - ARE BIOSOLIDS LIQUID AND INJECTED INTO SOIL?
3 - ARE BIOSOLID DEWATERED AND APPLIED IN ANY MANNER?

YES

-

VOLATILIZATION FACTORS $K_v =$

0.5

MINERALIZATION RATE F_M

WHAT BIOSOLID PROCESS GENERATE THE FRACTION (F_M) OF ORGANIC NITROGEN? (SELECT ONLY ONE)

SELECT PROCESS

- NONE (Unstabilized)
ALKALINE STABILIZATION
AEROBIC DIGESTION
ANAEROBIC DIGESTION
COMPOSING

-

SELECTION CHOICE:

1 SELECTED

MINERALIZATION RATE $F_M =$

0.3

AGRONOMIC LOADING RATE

3.3

tons/acre



Nationwide Analytical Laboratories
 36 South Willow Avenue, Suite B
 Cookeville, TN 38501
 Pete's Cell: (931) 644-7034
 John's Cell: (931) 261-2180

Phone: (931) 520-0263 / Fax: (931) 520-0264

CERTIFICATE OF ANALYSIS

Tommy Buford
City of Baxter Wastewater Treatment Plant
 P.O. Box 283
 Baxter, TN 38544

COA ID: NWA 7285-2

Receipt Date: 1/21/2020
 Report Date: 2/5/2020

Phone: 931-858-3348 Fax:
 Email: mwwtp@frontiernet.net
 Account Number: 20110002

Mobile:

Project Description:
 Sludge Analysis - Metals - Dry Weight Basis

P.O. Number:
1251

	Sample ID / Sampling Date / Sampling Time / Collected By / Analysis Date									
Analysis Description	Digester									
Method / Detection Limit (units)	7285-2	1/21/2020	8:21 AM	Tommy Buford						
Mercury, Hg (outsourced) EPA 245.1 (mg/Kg - Dry)	1.36									
Arsenic, As (outsourced) EPA 200.7 by ICP (mg/Kg - Dry)	ND									
Cadmium, Cd (outsourced) EPA 200.7 by ICP (mg/Kg - Dry)	ND									
Copper, Cu (outsourced) EPA 200.7 by ICP (mg/Kg - Dry)	246.8									
Lead, Pb (outsourced) EPA 200.7 by ICP (mg/Kg - Dry)	16.9									
Molybdenum, Mo (outsourced) EPA 200.7 by ICP (mg/Kg - Dry)	ND									
Nickel, Ni (outsourced) EPA 200.7 by ICP (mg/Kg - Dry)	ND									
Selenium, Se (outsourced) EPA 200.7 by ICP (mg/Kg - Dry)	ND									
Zinc, Zn (outsourced) EPA 200.7 by ICP (mg/Kg - Dry)	844.2									
Total Solids (%) EPA 2540G	1.54									
Voatile solid (% of total solids) EPA 2540G	71.55									
ND = None Detected										

EPA Laboratory Number: TN01235



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 Cookeville, TN 38501
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 John's Cell: (931) 261-2180

Phone: (931) 520-0263 / Fax: (931) 520-0264

CERTIFICATE OF ANALYSIS

Tommy Buford
 City of Baxter Wastewater Treatment Plant
 P.O. Box 283
 Baxter, TN 38544

COA ID: NWA 7285-1

Receipt Date: 1/21/2020
 Report Date: 2/5/2020

Phone: 931-858-3348 Fax:
 Email: mwwtp@frontiernet.net
 Account Number: 20110002

Mobile:

Project Description:
 Sludge Analysis - Dry Weight Basis

P.O. Number:
 1251

Analysis Description Method / Detection Limit (units)	Sample ID / Sampling Date / Sampling Time / Collected By / Analysis Date									
	Digester 7285-1 1/21/2020 8:21 AM Tommy Buford									
Total Phosphorus EPA 365.3 / 0.01 mg/L	16160									
Ammonia EPA 350.1 / 0.03 mg/L	43.18									
Nitrate + Nitrite EPA 353.2 / 0.02 mg/L	2307									
Nitrite (NO2-N) EPA 353.2 / 0.02 mg/L	<0.02									
Nitrate (NO3-N) EPA 353.2 / 0.02 mg/L	2307									
Total Nitrogen (TPN) SM 4500N Organic C / 0.04 mg/L	50873									
Kjeldahl Nitrogen (TKN) Calculated / 0.04 mg/L	48566									
Total Solids (%) EPA 2540G	1.54									
Voatile solid (% of total solids) EPA 2540G	71.55									

EPA Laboratory Number: TN01235

ANALYTICAL REPORT

January 15, 2019

City of Baxter WWTP

Sample Delivery Group: L1058224
Samples Received: 01/04/2019
Project Number: TCLP/PCB
Description:
Site: TN0021121
Report To: Mr. Tommy Buford
PO Box 283
Baxter, TN 38544

Entire Report Reviewed By:



Stacy Kennedy
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

DIGESTER SLUDGE

SAMPLE RESULTS - 01

ONE LAB. NATIONWIDE



Collected date/time: 01/03/19 08:00

L1058224

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	0.580		1	01/08/2019 18:11	WG1220604

1 Cp

2 Tc

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (wet) mg/kg	RDL (Wet) mg/kg	Result (dry) mg/kg	RDL (dry) mg/kg	Qualifier	Dilution	Analysis date / time	Batch
PCB 1016	ND	0.265	ND	45.7		15.6	01/06/2019 09:39	WG1219737
PCB 1221	ND	0.265	ND	45.7		15.6	01/06/2019 09:39	WG1219737
PCB 1232	ND	0.265	ND	45.7		15.6	01/06/2019 09:39	WG1219737
PCB 1242	ND	0.265	ND	45.7		15.6	01/06/2019 09:39	WG1219737
PCB 1248	ND	0.265	ND	45.7		15.6	01/06/2019 09:39	WG1219737
PCB 1254	ND	0.265	ND	45.7		15.6	01/06/2019 09:39	WG1219737
PCB 1260	ND	0.265	ND	45.7		15.6	01/06/2019 09:39	WG1219737
(S) Decachlorobiphenyl	96.2			10.0-135			01/06/2019 09:39	WG1219737
(S) Tetrachloro-m-xylene	91.6			10.0-139			01/06/2019 09:39	WG1219737

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

DIGESTER SLUDGE

SAMPLE RESULTS - 02

ONE LAB. NATIONWIDE



Collected date/time: 01/03/19 08:00

L1058224

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		1/7/2019 10:19:19 AM	WG1220097
TCLP ZHE Extraction	-		1/7/2019 1:19:12 PM	WG1220169
Fluid	1		1/7/2019 10:19:19 AM	WG1220097
Initial pH	6.97		1/7/2019 10:19:19 AM	WG1220097
Final pH	4.81		1/7/2019 10:19:19 AM	WG1220097

- Cp
- 2 Tc
- 3 Ss
- 4 Cn

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	01/08/2019 13:54	WG1220346

- 5 Sr
- 6 Qc

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	01/09/2019 11:02	WG1220385
Barium	0.123		0.100	100	1	01/09/2019 11:02	WG1220385
Cadmium	ND		0.100	1	1	01/09/2019 11:02	WG1220385
Chromium	ND		0.100	5	1	01/09/2019 11:02	WG1220385
Lead	ND		0.100	5	1	01/09/2019 11:02	WG1220385
Selenium	ND		0.100	1	1	01/09/2019 11:02	WG1220385
Silver	ND		0.100	5	1	01/09/2019 11:02	WG1220385

- 7 Gl
- 8 Al
- 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	01/08/2019 14:38	WG1220424
Carbon tetrachloride	ND		0.0500	0.50	1	01/08/2019 14:38	WG1220424
Chlorobenzene	ND		0.0500	100	1	01/08/2019 14:38	WG1220424
Chloroform	ND		0.250	6	1	01/08/2019 14:38	WG1220424
1,2-Dichloroethane	ND		0.0500	0.50	1	01/08/2019 14:38	WG1220424
1,1-Dichloroethene	ND		0.0500	0.70	1	01/08/2019 14:38	WG1220424
2-Butanone (MEK)	ND		0.500	200	1	01/08/2019 14:38	WG1220424
Tetrachloroethene	ND		0.0500	0.70	1	01/08/2019 14:38	WG1220424
Trichloroethene	ND		0.0500	0.50	1	01/08/2019 14:38	WG1220424
Vinyl chloride	ND		0.0500	0.20	1	01/08/2019 14:38	WG1220424
(S) Toluene-d8	107		80.0-120			01/08/2019 14:38	WG1220424
(S) Dibromofluoromethane	87.9		75.0-120			01/08/2019 14:38	WG1220424
(S) α,α,α-Trifluorotoluene	106		80.0-120			01/08/2019 14:38	WG1220424
(S) 4-Bromofluorobenzene	111		77.0-126			01/08/2019 14:38	WG1220424

Chlorinated Acid Herbicides (GC) by Method 8151A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,5-TP (Silvex)	ND		0.00200	1	1	01/09/2019 14:49	WG1220908
2,4-D	ND		0.00200	10	1	01/09/2019 14:49	WG1220908
(S) 2,4-Dichlorophenyl Acetic Acid	93.4		14.0-158			01/09/2019 14:49	WG1220908

Pesticides (GC) by Method 8081B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Chlordane	ND		0.00500	0.03	1	01/10/2019 18:36	WG1220678
Endrin	ND		0.00500	0.02	1	01/10/2019 18:36	WG1220678
Heptachlor	ND		0.00500	0.0080	1	01/10/2019 18:36	WG1220678

DIGESTER SLUDGE

SAMPLE RESULTS - 02

ONE LAB: NATIONWIDE



Collected date/time: 01/03/19 08:00

L1058224

Pesticides (GC) by Method 8081B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Lindane	ND		0.00500	0.40	1	01/10/2019 18:36	WG1220678
Methoxychlor	ND		0.00500	10	1	01/10/2019 18:36	WG1220678
Toxaphene	ND		0.0100	0.50	1	01/10/2019 18:36	WG1220678
(S) Decachlorobiphenyl	100		10.0-128			01/10/2019 18:36	WG1220678
(S) Tetrachloro-m-xylene	98.1		10.0-127			01/10/2019 18:36	WG1220678

1 Cp

2 Tc

3 Ss

4 Cn

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	01/09/2019 23:05	WG1220676
2,4-Dinitrotoluene	ND		0.100	0.13	1	01/09/2019 23:05	WG1220676
Hexachlorobenzene	ND		0.100	0.13	1	01/09/2019 23:05	WG1220676
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	01/09/2019 23:05	WG1220676
Hexachloroethane	ND		0.100	3	1	01/09/2019 23:05	WG1220676
Nitrobenzene	ND		0.100	2	1	01/09/2019 23:05	WG1220676
Pyridine	ND		0.100	5	1	01/09/2019 23:05	WG1220676
3&4-Methyl Phenol	ND		0.100	400	1	01/09/2019 23:05	WG1220676
2-Methylphenol	ND		0.100	200	1	01/09/2019 23:05	WG1220676
Pentachlorophenol	ND		0.100	100	1	01/09/2019 23:05	WG1220676
2,4,5-Trichlorophenol	ND		0.100	400	1	01/09/2019 23:05	WG1220676
2,4,6-Trichlorophenol	ND		0.100	2	1	01/09/2019 23:05	WG1220676
(S) 2-Fluorophenol	32.3		10.0-120			01/09/2019 23:05	WG1220676
(S) Phenol-d5	18.1		10.0-120			01/09/2019 23:05	WG1220676
(S) Nitrobenzene-d5	42.4		10.0-127			01/09/2019 23:05	WG1220676
(S) 2-Fluorobiphenyl	39.6		10.0-130			01/09/2019 23:05	WG1220676
(S) 2,4,6-Tribromophenol	38.2		10.0-155			01/09/2019 23:05	WG1220676
(S) p-Terphenyl-d14	44.6		10.0-128			01/09/2019 23:05	WG1220676

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Biosolid Pathogen Worksheet

Class B Fecal Coliform

Liquid sample < 7% solids, for solid samples see p 138 of Whitehouse Manual 1999 edition
Membrane filter, SM 9222 D

Sample location Dig #1 Date 11-13-20 Sample Time 0808
Analyst TB Incubator Time IN 0838 OUT 0901 11-14-20

Dilution A: To 99 ml of sterile dilution water add 1ml of sample = 0.01 ml original sample / ml
Dilution B: To 99 ml of sterile dilution water add 1.0 ml of dilution A = 0.0001 ml original sample / ml
Dilution C: To 99 ml of sterile dilution water add 1.0 ml of dilution B = 0.000001 ml original sample / ml

Filter Number	Volume and Dilution	ml of original sample
Filter 1	1.0 ml dilution A	0.01
Filter 2	10 ml Dilution B	0.001
Filter 3	1.0 ml Dilution B	0.0001
Filter 4	10 ml Dilution C	0.00001

If needed adjust volumes and dilutions to produce 20-60 colonies per membrane filter
Use the same counting rules that apply to effluent Fecal Coliform

Calculations of total solids see SM 2540 G.

CFU / gram = $\frac{\text{Colonies Counted}}{\text{ml of original sample} * \% \text{ total solids as decimal}}$

Note: Test fails if
CFU/gram > 2,000,000

Filter 1 CFU / gram = $\frac{1}{0.01 * (.0117)} = 8,547$

Filter 2 CFU / gram = $\frac{ND}{0.001 * (.0117)}$

Filter 3 CFU / gram = $\frac{ND}{0.0001 * (.0117)}$

Filter 4 CFU / gram = $\frac{ND}{0.00001 * (.0117)}$

ND = NOT
DETECTED

References: Standard Methods for the examination of Water and Wastewater
18 th Edition

Environmental Regulations and Technology, Control of pathogens and Vector attraction in
Sewage Sludge. (Whitehouse Book) Page 103-104, 1992 edition, pp.138-138, 1999 edition

Sludge Total and Volatile Solids
Total Solids see S.M. 2540 G

Date 11-13-20 Sample Location Dig #1 Sampler TB
Time 0808
Test Time 0813

Weight of Dish A = 48.4031

Weight of Dish and Wet Sludge B = 72.4020

Weight of Wet Sludge C = 23.9989

Weight after Drying D = 48.6832

Weight after Ignition E = NA

% Solids = $\frac{(D-A) * 100}{(B-A)}$

% Total Solids = $\frac{(48.6832 - 48.4031)}{(72.4020 - 48.4031)} = \frac{.2801}{23.9989} = .0117 * 100 = 1.17\%$

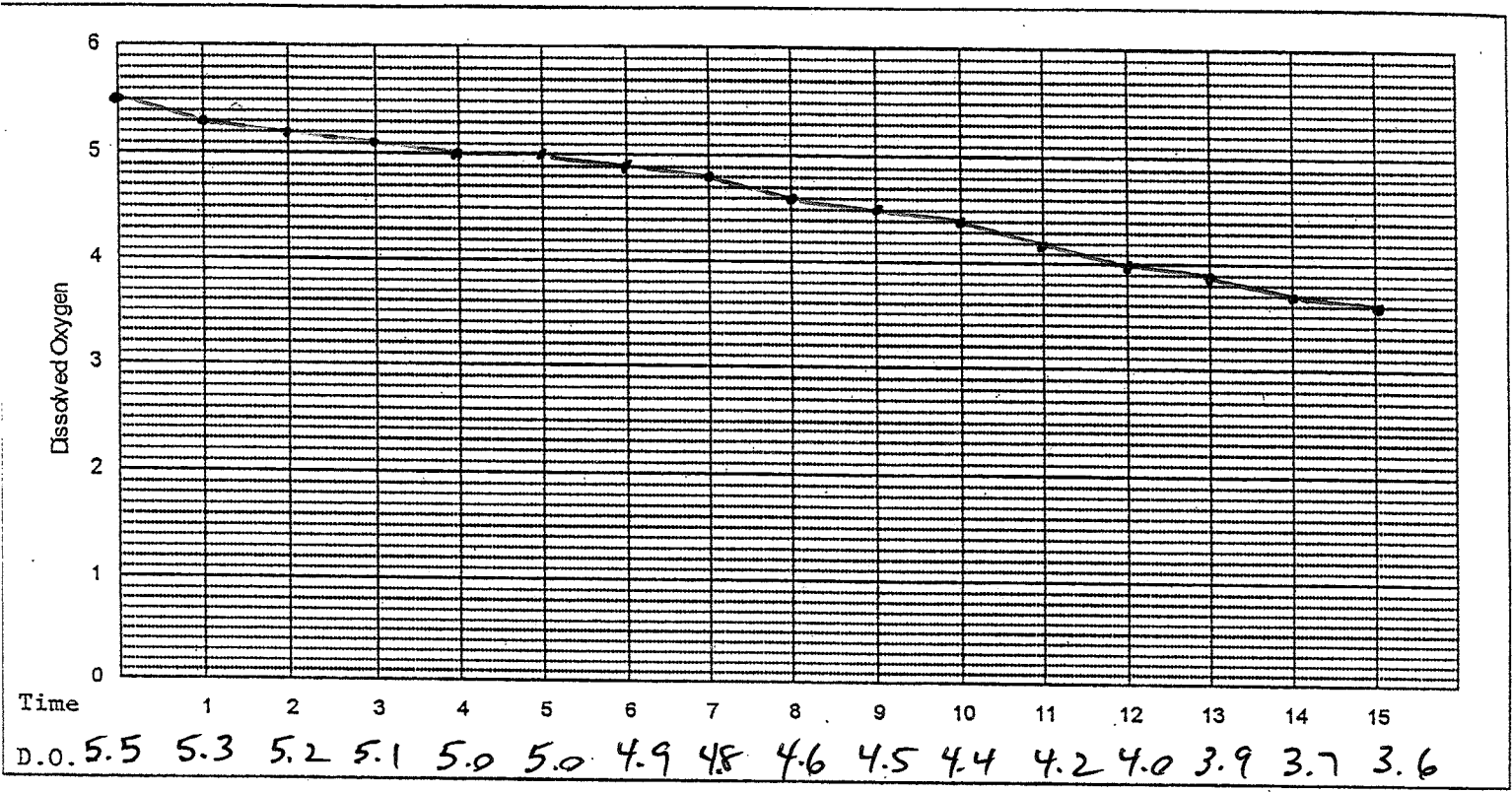
% Volatile = $\frac{(D-E) * 100}{(C-A)}$

% Volatile = $\frac{(\quad - \quad)}{(\quad - \quad)} = \frac{(\quad)}{(\quad)} = \quad * 100$

Metric Tons = $\frac{\text{gallons} * 8.34 * \text{Total Solids as a decimal}}{2205}$

Specific Oxygen Uptake Rate
SOUR

Date 11-13-20 Sample Location Dig #1 Temperature 19.9 °C
 Time 0910



Begin Temp 19.5 °C Average Temp 19.9 °C End Temp 20.3 °C

Enter D.O. readings at each elapsed minute on the graph.
 Graph the data and determine the time period where the slope is constant with a best fit line.
 Use the first and last D.O. reading from this constant slope portion of the graph in the OUR formula.

Oxygen Uptake Rate (OUR) (S.M. 2710B)

$$\text{OUR mg O}_2/\text{L/hr} = \frac{\text{Begin Dissolved Oxygen} - \text{End Dissolved Oxygen}}{\text{Elapsed Time}} * 60$$

$$\text{OUR} = \frac{5.5 \text{ mg/L} - 3.6 \text{ mg/L}}{15 \text{ Minutes}} * 60 = 7.6 \text{ mg O}_2/\text{L/hr}$$

Specific Oxygen Uptake Rate (SOUR)

$$1. \quad \text{SOUR mg O}_2/\text{hr/g} = \frac{\text{OUR mg O}_2/\text{L/hr}}{\% \text{ Total Solids} * 1000 \text{ g/L}}$$

Note: enter total solids as a decimal, see S.M. 2540 G

$$\text{SOUR} = \frac{7.6 \text{ mg O}_2/\text{L/hr}}{.0117 * 1000 \text{ g/L}} = .650 \text{ mg O}_2/\text{hr/g}$$

Temperature Adjustment

SOUR @ Average Temp * Adjustment, or correction factor = SOUR @ 20° C

$$\frac{.650 \text{ mg O}_2/\text{hr/g}}{\text{@ } 20 \text{ } ^\circ\text{C}} * 1.0 = .650 \text{ mg O}_2/\text{hr/g @ } 20 \text{ } ^\circ\text{C}$$

Note: See adjustment formula and correction factors on the next page.

Specific Oxygen Uptake Rate

Temperature Adjustment

SOUR is determined at the digester's ambient temperature and then adjusted as follows.

$$\text{SOUR}@20^{\circ}\text{C} = \text{SOUR @ Ambient Temp.} * A^{(20-\text{Ambient temp.})}$$

Where A = 1.05 above 20°

= 1.07 below 20°

These factors are good between 10° C and 30° C

Simplified

$$\text{SOUR @}20^{\circ}\text{C} = \text{SOUR @ Ambient Temp.} * \text{Correction}$$

$$\text{Correction} = A^{(20-\text{Ambient Temp})}$$

Temp° C	Correction
10	1.97
11	1.84
12	1.72
13	1.60
14	1.50
15	1.40
16	1.31
17	1.22
18	1.14
19	1.07
20	1.00
21	0.95
22	0.90
23	0.86
24	0.82
25	0.78
26	0.75
27	0.71
28	0.68
29	0.64
30	0.61