

Town of Baileyton W.W.T.P.
6530 Horton Highway
Greeneville, TN 37745
Phone #(423) 234-6911
Fax # (423) 234-5442

January 11, 2019

To; Whom it May Concern

I certify, under penalty of law that the Class B pathogen requirements in 503.32(b) and vector attraction requirements in 503.33(b)(1) or (b) (3) have been met. This determination has been under my supervision in accordance with the system design to insure that qualified personnel properly gather and evaluate the information used to determine that the pathogen and vector attraction requirements have been met. I am aware that there are significant penalties for the false certification including the possibility of fines and imprisonment.

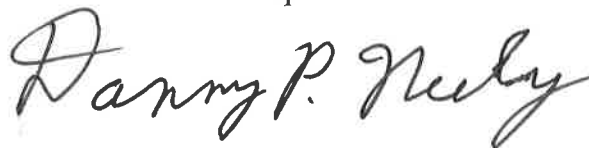
W.W.T.P. Operator



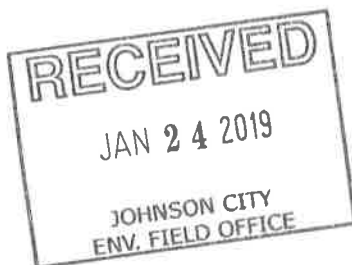
Danny P. Neely

I certify under penalty of law that the management practices in CFR 40 Section 503.14 have been met for the site on which the bulk sewage sludge is applied. This determination has been under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices have been met. I am aware that there are significant penalties for the false certification including the possibility of fines and imprisonment.

W.W.T.P. Operator



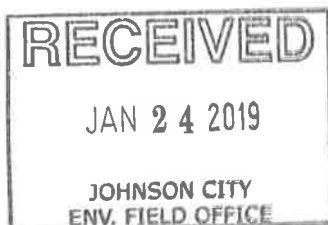
Danny P. Neely



**Town of Baileyton
W.W.T.P.
Annual Sludge Report**

Year 2018

	Tons of Sludge Hauled	S.O.U.R. Test mg/l
January		
February		
March		
April		0.20
May		
June		
July	4.00	
August	1.50	
September		
October	1.36	
November		
December		
Total	6.86	0.20
Avg	2.29	0.20



E.A.C. Johnson City Site Tracking Number LA
 Laboratory Name ESC Date of Analysis 4-17-18

Sludge/Biosolids Analysis	DRY WT. Units	
Total Kjeldahl Nitrogen, (TKN)	26,400	mg/kg
Ammonium nitrogen, (NH ₄ -N)	790	mg/kg
Nitrate plus Nitrite nitrogen, (NO ₃ -N + NO ₂ -N)	12,300	mg/kg

Attach a copy of the laboratory analysis used for these calculations to this report.

Crop Type Hay 120 lb N/acre/year

To convert milligrams per kilogram to pounds per ton multiply by 0.002.

- Available nitrogen from biosolids.
 - Total Kjeldahl Nitrogen, (TKN). $26,400 \times 0.002$ Calculated Units
 $(TKN(mg/kg) \times 0.002)$ 53 lbs/ton
 - Ammonium nitrogen, (NH₄-N). 790×0.002 2 lbs/ton
 $(NH_4-N (mg/kg) \times 0.002)$
 - Nitrate plus Nitrite nitrogen, (NO₃-N + NO₂-N). $12,300 \times 0.002$ 25 lbs/ton
 $(NO_3-N + NO_2-N) mg/kg \times 0.002)$
 - Total available inorganic nitrogen. $(27.5) + 25$ 26 lbs/ton
 $(1b \times Kv) plus 1c)$ Obtain Kv from Exhibit C. 0.25 *Surface applied liquid*
 - Organic nitrogen in biosolids. $53 - 2$ 51 lbs/ton
 $(Subtract 1b from 1a.)$
 - Available organic nitrogen for the first year of application. 15 lbs/ton
 $(Multiply 1e by F_M for anaerobic or aerobic process.)$ $51 \times .3$
 Obtain F_M from Exhibit D. .3
 - Total nitrogen available from biosolids. 41 lbs/ton
 $26 + 15$
 Add 1d and 1f.
- Available nitrogen in the soil. 10 lbs/ton
 - Soil test results of background nitrogen in soil.
 - or, Estimate of available nitrogen from previous biosolids applications. (If estimate, attach explanation of how estimated.)
- Nitrogen supplied from other sources.
 - Nitrogen from supplemental fertilizers. (If appropriate) 0 lbs/ton
 - Nitrogen from irrigation water. (If appropriate) 0 lbs/ton
 - Nitrogen from previous crop. (Unless #2 is based in soil testing.) 0 lbs/ton
 - Other (If appropriate) (specify) 0 lbs/ton
 - Total nitrogen from other sources; add a,b,c and d if available. 0 lbs/ton
- Total nitrogen available from existing sources. 10 lbs/ton
 Add 2. And 3e.
- Total nitrogen requirement of crop. 120 lbs/acre
 (Obtain information from Exhibit E or agricultural extension agents or other agronomy professionals.)
- Supplemental nitrogen needed from biosolids. 110 lbs/ton
 (Subtract 4. from 5.) $\frac{110}{.41} = 2,683 T/A$
- Agronomic loading rate. tons/acre
 (Divide 6. by 1g.)

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Initial Site approval is for one (1) year. Approved by _____ Date _____

These calculations are required to be updated with new sample analysis and re-submitted on an annual basis on or before, February 19th to the Central office of the Tennessee Division of Water Pollution Control.

$\frac{6,876 T}{457} = .15 T$
Actual Applied

COMMENTS

$\frac{2,683 T}{A} \times \frac{2000 lbs}{T} \times \frac{8.34 lbs}{8.34 lbs}$

Sample Collection Data

Date of Sampling	Time of Sampling	Opr	Sampling Location	Type of Sample	Preservative Used	Container Type
4/17/18	2:00 PM	DN	Digester	Grab	None	Polyethelene

Part #2: Sludge Solids Contents - Standard Method 2540-B

Date of Analysis	Time of Analysis	Opr Doing Analysis	Size of Sample	Quality Control	Description of Contents
4/17/18	2:10	DN	3:00 mL	Duplicate	Sludge

Sample ID#	TARE Weight	TARE & Solids	Net Solids (g/sample)	Percent (%) Solids	Total grams per Liter
D. 9A2	0.3588	1.7061	1.3473 ¹⁰	0.013473 ¹²	13.473 ¹²

Part #3: Specific Oxygen Uptake Rate (SOUR)-Method 4500-O-G

t
0°C
16.00

Duration in Minutes	Dissolved O2 (mg/L)	Duration in Minutes	Dissolved O2 (mg/L)	Duration in Minutes	Dissolved O2 (mg/L)
0	9.39	6	9.11	12	8.83
1	9.34	7	9.05	13	8.80
2	9.27	8	9.00	14	8.76
3	9.22	9	8.95	15	8.72
4	9.18	10	8.90	20	
5	9.14	11	8.87	30	

Ending Temp °C
17.40

0.67/5 =

SOUR mg/L/min	SOUR mg/L/hr	SOUR mg/g/hr	Date of Analysis	Time of Analysis	Operator
0.049 ³	2.68 ⁴	0.20 ⁵	4/17/18	2:45	DN

NOTE: Net solids / sample size * 100 = grams per 100 mL or Percent (%) solids.

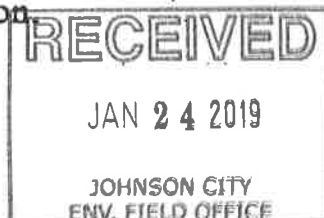
② Percent (%) solids * 10 = grams per liter.

③ Total O2 uptake (mg/L) / total duration minutes = SOUR (mg/L/min).

④ SOUR (mg/L/min) * 60 = SOUR (mg/L/hr).

⑤ SOUR (mg/L/hr) / grams per liter = SOUR (mg/g/hr).

⑥ SOUR must be < 1.5 mg/g/hr for vector attraction reduction

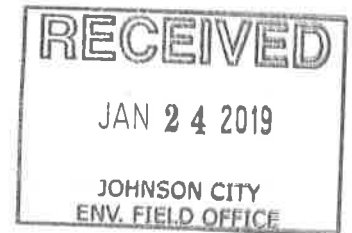


April 26, 2018

Town of Baileyton WWTP

Sample Delivery Group: L986157
Samples Received: 04/17/2018
Project Number:
Description:

Report To: Mr. Danny Neely
6530 Horton Highway
Greeneville, TN 37745



Entire Report Reviewed By:

A handwritten signature in cursive script that reads "Linda Cashman".

Linda Cashman
Technical Service Representative

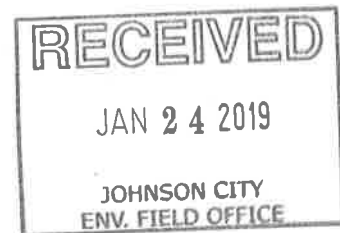
Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating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



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



SLUDGE L986157-01 Solid

Collected by: Danny Neely
 Collected date/time: 04/16/18 12:30
 Received date/time: 04/17/18 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1099317	1	04/17/18 20:47	04/17/18 21:05	BS
Wet Chemistry by Method 350.1	WG1101632	1	04/22/18 12:03	04/22/18 13:55	KK
Wet Chemistry by Method 4500N Org C-2011	WG1099701	1	04/19/18 09:00	04/20/18 12:45	KK
Wet Chemistry by Method 9056A	WG1099259	10	04/17/18 16:06	04/19/18 01:08	MAJ
Mercury by Method 7471A	WG1100236	1	04/19/18 09:28	04/20/18 01:26	EL
Metals (ICP) by Method 6010B	WG1100250	.1	04/19/18 10:30	04/19/18 22:25	TRB



SLUDGE L986157-02 Solid

Collected by: Danny Neely
 Collected date/time: 04/16/18 12:30
 Received date/time: 04/17/18 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Microbiology by Method EPA 1681	WG1099250	1000	04/17/18 11:30	04/17/18 11:30	KMR

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Linda Cashman

Linda Cashman
Technical Service Representative

- 1 Pd
- 2 Tc
- 3 Ss
- Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

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SLUDGE

SAMPLE RESULTS - 01

ONE LAB. NATIONWIDE



Collected date/time: 04/16/18 12:30

L986157

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	1.54		1	04/17/2018 21:05	<u>WG1099317</u>

Wet Chemistry by Method 350.1

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis	Batch
	mg/kg	mg/kg	mg/kg	mg/kg			date / time	
Ammonia Nitrogen	12.2	5.00	790	324		1	04/22/2018 13:55	<u>WG1101632</u>

Wet Chemistry by Method 4500NOrg C-2011

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis	Batch
	mg/kg	mg/kg	mg/kg	mg/kg			date / time	
Kjeldahl Nitrogen, TKN	408	20.0	26400	1290		1	04/20/2018 12:45	<u>WG1099701</u>

Wet Chemistry by Method 9056A

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis	Batch
	mg/kg	mg/kg	mg/kg	mg/kg			date / time	
Nitrate as (N)	190	10.0	12300	647		10	04/19/2018 01:08	<u>WG1099259</u>

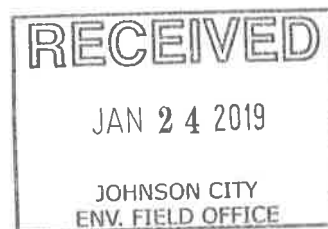
Mercury by Method 7471A

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis	Batch
	mg/kg	mg/kg	mg/kg	mg/kg			date / time	
Mercury	ND	0.0200	ND	1.29		1	04/20/2018 01:26	<u>WG1100236</u>

Metals (ICP) by Method 6010B

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis	Batch
	mg/kg	mg/kg	mg/kg	mg/kg			date / time	
Arsenic	ND	0.200	ND	12.9		.1	04/19/2018 22:25	<u>WG1100250</u>
Cadmium	ND	0.0500	ND	3.24		.1	04/19/2018 22:25	<u>WG1100250</u>
Chromium	0.348	0.100	22.5	6.47		.1	04/19/2018 22:25	<u>WG1100250</u>
Lead	0.139	0.0500	9.02	3.24		.1	04/19/2018 22:25	<u>WG1100250</u>
Molybdenum	0.105	0.0500	6.80	3.24		.1	04/19/2018 22:25	<u>WG1100250</u>
Nickel	0.253	0.200	16.4	12.9		.1	04/19/2018 22:25	<u>WG1100250</u>
Selenium	ND	0.200	ND	12.9		.1	04/19/2018 22:25	<u>WG1100250</u>
Zinc	14.4	0.500	930	32.4		.1	04/19/2018 22:25	<u>WG1100250</u>

- 1
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



SLUDGE

Collected date/time: 04/16/18 12:30

SAMPLE RESULTS - 02

L986157

ONE LAB. NATIONWIDE.



Microbiology by Method EPA 1681

Analyte	Result MPN/g	Qualifier	Dilution	Analysis date / time	Batch
Fecal Coliform -Geom.Mean	<8611.2		1000	04/17/2018 11:30	WG1099250
Fecal Coliform -1	<8084.6		1000	04/17/2018 11:30	WG1099250
Fecal Coliform -2	<8627.6		1000	04/17/2018 11:30	WG1099250
Fecal Coliform -3	<8944.6		1000	04/17/2018 11:30	WG1099250
Fecal Coliform -4	<8218.6		1000	04/17/2018 11:30	WG1099250
Fecal Coliform -5	<8477.8		1000	04/17/2018 11:30	WG1099250
Fecal Coliform -6	<9771.3		1000	04/17/2018 11:30	WG1099250
Fecal Coliform -7	<8266.5		1000	04/17/2018 11:30	WG1099250

- 1
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 GI
- 8 AI
- 9 Sc

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Method Blank (MB)

(MB) R3302910-1 04/17/18 21:05

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000			

L986157-01 Original Sample (OS) • Duplicate (DUP)

(OS) L986157-01 04/17/18 21:05 • (DUP) R3302910-4 04/17/18 21:05

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	1.54	1.55	1	0.281		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302910-2 04/17/18 21:05 • (LCSD) R3302910-3 04/17/18 21:05

Analyte	Spike Amount %	LCS Result %	LCSD Result %	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Total Solids	50.0	50.0	50.0	100	99.9	85.0-115			0.0360	5



WG1101632

Wet Chemistry by Method 350.1

QUALITY CONTROL SUMMARY

L986157-01

ONE LAB. NATIONWIDE.

Method Blank (MB)

(MB) R3303747-1 04/22/18 13:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Ammonia Nitrogen	U		1.57	5.00

L986384-01 Original Sample (OS) • Duplicate (DUP)

(OS) L986384-01 04/22/18 13:56 • (DUP) R3303747-6 04/22/18 13:57

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	4.97	6.47	1	26.3	P1	20

L986713-05 Original Sample (OS) • Duplicate (DUP)

(OS) L986713-05 04/22/18 14:11 • (DUP) R3303747-9 04/22/18 14:12

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	4.94	1.85	1	91.2	J P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303747-2 04/22/18 13:40 • (LCSD) R3303747-3 04/22/18 13:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	500	460	469	91.9	93.8	90.0-110		2.05	20	20

L985478-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985478-01 04/22/18 13:43 • (MS) R3303747-4 04/22/18 13:44 • (MSD) R3303747-5 04/22/18 13:45

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	603	U	299	280	1	80.0-120	J6	J6	6.67	20

ACCOUNT: Town of Baileyton WWTP

PROJECT:

SDG: L986157

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2 Tc
 3 Ss
 4 Cn
 5 Sr
 6 Ca
 7 Gl
 8 Al
 9 Sc

WG1101632

Wet Chemistry by Method 350.1

QUALITY CONTROL SUMMARY

L986157-01

ONE LAB, NATIONWIDE.

L986388-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L986388-01 04/22/18 14:01 • (MS) R3303747-7 04/22/18 14:02 • (MSD) R3303747-8 04/22/18 14:05

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	628	U	369	347	1	80.0-120	J6	J6	6.15	20

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2 Tc
3 Ss
4 Cn
5 Sr
6 Cc
7 Gl
8 Al
9 Sc

ACCOUNT: Town of Baileyton WWTP

PROJECT:

SDG: L986157

DATE/TIME: 04/26/18 22:08

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Method Blank (MB)

(MB) R3303490-1 04/20/18 12:28

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Kjeldahl Nitrogen, TKN	U		4.48	20.0

L986111-01 Original Sample (OS) • Duplicate (DUP)

(OS) L986111-01 04/20/18 13:00 • (DUP) R3303490-8 04/20/18 13:01

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Kjeldahl Nitrogen, TKN	1970	2620	5	28.4	J3	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303490-2 04/20/18 12:29 • (LCSD) R3303490-3 04/20/18 12:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Kjeldahl Nitrogen, TKN	400	382	404	95.5	101	90.0-110			5.60	20



WG1099259

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

L986157-01

ONE LAB. NATIONWIDE.

Method Blank (MB)

(MB) R3303173-1 04/18/18 15:27

Analyte	MB Result mg/kg	MB MDL mg/kg	MB RDL mg/kg
Nitrate	U	0.0116	1.00

L986229-01 Original Sample (OS) • Duplicate (DUP)

(OS) L986229-01 04/19/18 02:10 • (DUP) R3303173-8 04/19/18 02:31

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier Limits	DUP RPD Limits
Nitrate	23.7	24.0	10	1.29	15	15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303173-2 04/18/18 15:48 • (LCSD) R3303173-3 04/18/18 16:09

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Nitrate	20.0	19.1	19.1	95.6	95.4	80.0-120	0.288	0.288	15	15

L986111-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L986111-02 04/18/18 20:57 • (MS) R3303173-6 04/18/18 21:17 • (MSD) R3303173-7 04/18/18 21:38

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Nitrate	50.0	8.41	59.0	56.2	101	95.6	1	80.0-120	4.93	4.93	15	15



WG1100236

Mercury by Method 7471A

QUALITY CONTROL SUMMARY

L986157-01

ONE LAB. NATIONWIDE.

Method Blank (MB)

(MB) R3303318-1 04/20/18 00:15

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U	0.00280	0.00280	0.0200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303318-2 04/20/18 00:17 • (LCSD) R3303318-3 04/20/18 00:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.278	0.288	92.6	96.0	80.0-120			3.67	20

L985997-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985997-02 04/20/18 00:22 • (MS) R3303318-4 04/20/18 00:25 • (MSD) R3303318-5 04/20/18 00:33

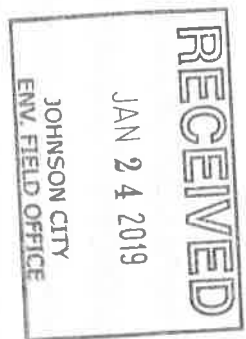
Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.00775	0.279	0.285	90.5	92.5	1	75.0-125			2.10	20

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Method Blank (MB)

(MB) R3303324-1 04/19/18 21:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Arsenic	U		0.650	2.00
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Lead	U		0.190	0.500
Molybdenum	U		0.160	0.500
Nickel	U		0.490	2.00
Selenium	U		0.740	2.00
Zinc	U		0.590	5.00



Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303324-2 04/19/18 22:02 • (LCSD) R3303324-3 04/19/18 22:05

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Arsenic	100	95.4	96.3	95.4	96.3	80.0-120	0.903		20	20
Cadmium	100	94.3	95.6	94.3	95.6	80.0-120	1.37		20	20
Chromium	100	101	102	101	102	80.0-120	0.842		20	20
Lead	100	98.0	99.0	98.0	99.0	80.0-120	0.979		20	20
Molybdenum	100	98.3	99.2	98.3	99.2	80.0-120	0.891		20	20
Nickel	100	99.7	101	99.7	101	80.0-120	0.853		20	20
Selenium	100	98.7	100	98.7	100	80.0-120	1.27		20	20
Zinc	100	98.7	103	98.7	103	80.0-120	4.68		20	20

L986378-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L986378-01 04/19/18 22:08 • (MS) R3303324-6 04/19/18 22:18 • (MSD) R3303324-7 04/19/18 22:22

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%			%	%
Arsenic	104	U	98.1	92.8	94.0	88.9	1	75.0-125			5.53	20
Cadmium	104	U	100	94.3	95.9	90.4	1	75.0-125			5.95	20
Chromium	104	26.6	113	114	82.8	83.9	1	75.0-125			1.05	20
Lead	104	6.53	112	113	101	102	1	75.0-125			0.534	20
Molybdenum	104	U	97.6	91.5	93.5	87.7	1	75.0-125			6.45	20
Nickel	104	39.4	122	119	79.0	76.2	1	75.0-125			2.45	20
Selenium	104	U	103	96.3	98.4	92.3	1	75.0-125			6.38	20
Zinc	104	74.7	160	156	82.0	78.3	1	75.0-125			2.45	20





Guide to Reading and Understanding Your Laboratory Report

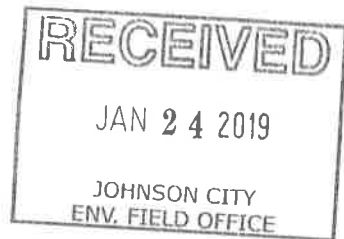
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

- 1 C
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc





ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

- 1
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State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky ^{1,6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas ⁶	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA - ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
AZLA - ISO 17025 ⁶	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



Town of Baileyton WWTP
 6530 Horton Highway
 Greeneville, TN 37745

Report to:
Mr. Danny Neely

Project Description:
BAILEY02-SLUDGE

Client Project #
BAILEY02-SLUDGE

Site/Facility ID #
BAILEY02-SLUDGE

City/State Collected:
BAILEY02-SLUDGE

P.O. #
BAILEY02-SLUDGE

Quote #
BAILEY02-SLUDGE

Request (Lab MUST Be Acquired)
 Same Day Five Day
 Next Day 5 Day (See Only)
 Two Day 10 Day (Rad Only)
 Three Day

Immediate Packaged on Ice: Y N

Sample ID

Analysis / Container / Preservative	Pics	Ch
FCLS Microbiological	X	
Metals 250mIHDP-NOPres	X	
NITRATE, NH3,TKN 250mIHDP-NOPres	X	
TSS/SLUDGE 250mIHDP-NOPres	X	

Accnum: **BAILEY02**
 Template: **T111405**
 Prelogin: **P647650**
 TSR: **650 - Linda Cashman**
 P#: **4/11/18 AD**
 Shipped Via: **FedEX Ground**

Remarks: **21**
22

Sample Receipt Checklist
 Coc Seal Intact/Intact: Y N
 Coc Signed/Recuato: Y N
 Bottles arrive Intact: Y N
 Correct bottles used: Y N
 Sufficient volume sent: Y N
 If Applicable
 VOA Zero Headpace: Y N
 Preservation Correct/Checked: Y N

if preservation required by Login: Date/Time
 Hold: NCF / DK
 Condition: NCF / DK

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Temp: **3.6°C**
 Date: **4/17/18**
 Trip Blank Received: Yes/No
 HCL / MeOH TBR
 Bottles Received: **12**
 Time: **0104**

Tracking # **72054444881**
 Received by: (Signature) **Danny Neely**
 Received by: (Signature) **Danny Neely**
 Received for lab by: (Signature) **Danny Neely**

December 14, 2018

Town of Baileyton WWTP

Sample Delivery Group: L1051120
Samples Received: 12/08/2018
Project Number:
Description:

Report To: Mr. Danny Neely
6530 Horton Highway
Greeneville, TN 37745



Entire Report Reviewed By:

Cassandra Foster

Cassandra Foster
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.



Cp: Cover Page	1	
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Cn: Case Narrative	4	
Sr: Sample Results	5	
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SLUDGE L1051120-02	6	
Qc: Quality Control Summary	8	
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Sc: Sample Chain of Custody	18	



SAMPLE SUMMARY

ONE LAB. NATIONWIDE. 

SLUDGE L1051120-01 Solid










Collected by
Danny P. Neely
Collected date/time
12/07/18 09:20
Received date/time
12/08/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1208497	14.6	12/11/18 07:30	12/11/18 20:16	TD

SLUDGE L1051120-02 Waste

Collected by
Danny P. Neely
Collected date/time
12/07/18 09:20
Received date/time
12/08/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1311	WG1208360	1	12/10/18 13:24	12/10/18 13:24	CGD
Preparation by Method 1311	WG1209109	1	12/11/18 14:52	12/11/18 14:52	RT
Mercury by Method 7470A	WG1209251	1	12/11/18 17:45	12/12/18 09:26	ABL
Metals (ICP) by Method 6010B	WG1209292	1	12/11/18 21:33	12/12/18 03:05	TRB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1209542	1	12/12/18 15:57	12/12/18 15:57	TJJ
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1209842	1	12/13/18 09:08	12/14/18 04:52	AO

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Cassandra Foster

Cassandra Foster
Project Manager

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

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Collected date/time: 12/07/18 09:20

L1051120

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
PCB 1016	ND		0.248	14.6	12/11/2018 20:16	WG1208497
PCB 1221	ND		0.248	14.6	12/11/2018 20:16	WG1208497
PCB 1232	ND		0.248	14.6	12/11/2018 20:16	WG1208497
PCB 1242	ND		0.248	14.6	12/11/2018 20:16	WG1208497
PCB 1248	ND		0.248	14.6	12/11/2018 20:16	WG1208497
PCB 1254	ND		0.248	14.6	12/11/2018 20:16	WG1208497
PCB 1260	ND		0.248	14.6	12/11/2018 20:16	WG1208497
(S) Decachlorobiphenyl	81.0		10.0-135		12/11/2018 20:16	WG1208497
(S) Tetrachloro-m-xylene	88.2		10.0-139		12/11/2018 20:16	WG1208497

Sample Narrative:

L1051120-01 WG1208497: Dilution due to matrix impact during extraction procedure

- 1
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 GI
- 8 AI
- 9 Sc



SLUDGE

Collected date/time: 12/07/18 09:20

SAMPLE RESULTS - 02

L1051120

ONE LAB. NATIONWIDE.



Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		12/10/2018 1:24:22 PM	WG1208360
TCLP ZHE Extraction	-		12/11/2018 2:52:13 PM	WG1209109
Fluid	1		12/10/2018 1:24:22 PM	WG1208360
Initial pH	7.25		12/10/2018 1:24:22 PM	WG1208360
Final pH	4.75		12/10/2018 1:24:22 PM	WG1208360

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	12/12/2018 09:26	WG1209251

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	12/12/2018 03:05	WG1209292
Barium	0.220		0.100	100	1	12/12/2018 03:05	WG1209292
Cadmium	ND		0.100	1	1	12/12/2018 03:05	WG1209292
Chromium	ND		0.100	5	1	12/12/2018 03:05	WG1209292
Lead	ND		0.100	5	1	12/12/2018 03:05	WG1209292
Selenium	ND		0.100	1	1	12/12/2018 03:05	WG1209292
Silver	ND		0.100	5	1	12/12/2018 03:05	WG1209292

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	12/12/2018 15:57	WG1209542
Carbon tetrachloride	ND		0.0500	0.50	1	12/12/2018 15:57	WG1209542
Chlorobenzene	ND		0.0500	100	1	12/12/2018 15:57	WG1209542
Chloroform	ND		0.250	6	1	12/12/2018 15:57	WG1209542
1,2-Dichloroethane	ND		0.0500	0.50	1	12/12/2018 15:57	WG1209542
1,1-Dichloroethene	ND		0.0500	0.70	1	12/12/2018 15:57	WG1209542
2-Butanone (MEK)	ND		0.500	200	1	12/12/2018 15:57	WG1209542
Tetrachloroethene	ND		0.0500	0.70	1	12/12/2018 15:57	WG1209542
Trichloroethene	ND		0.0500	0.50	1	12/12/2018 15:57	WG1209542
Vinyl chloride	ND		0.0500	0.20	1	12/12/2018 15:57	WG1209542
(S) Toluene-d8	97.0		80.0-120			12/12/2018 15:57	WG1209542
(S) Dibromofluoromethane	119		75.0-120			12/12/2018 15:57	WG1209542
(S) a,a,a-Trifluorotoluene	110		80.0-120			12/12/2018 15:57	WG1209542
(S) 4-Bromofluorobenzene	95.5		77.0-126			12/12/2018 15:57	WG1209542



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	12/14/2018 04:52	WG1209842
2,4-Dinitrotoluene	ND		0.100	0.13	1	12/14/2018 04:52	WG1209842
Hexachlorobenzene	ND		0.100	0.13	1	12/14/2018 04:52	WG1209842
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	12/14/2018 04:52	WG1209842
Hexachloroethane	ND		0.100	3	1	12/14/2018 04:52	WG1209842
Nitrobenzene	ND		0.100	2	1	12/14/2018 04:52	WG1209842
Pyridine	ND		0.100	5	1	12/14/2018 04:52	WG1209842
3&4-Methyl Phenol	ND		0.100	400	1	12/14/2018 04:52	WG1209842
2-Methylphenol	ND		0.100	200	1	12/14/2018 04:52	WG1209842
Pentachlorophenol	ND		0.100	100	1	12/14/2018 04:52	WG1209842
2,4,5-Trichlorophenol	ND		0.100	400	1	12/14/2018 04:52	WG1209842

ACCOUNT: Town of Baileyton WWTP

PROJECT:

SDG: L1051120

DATE/TIME: 12/14/18 16:43

PAGE: 6 of 18

SLUDGE

Collected date/time: 12/07/18 09:20

SAMPLE RESULTS - 02

L1051120

ONE LAB. NATIONWIDE.



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

Analyte	Result	Qualifier	RDL	Limit	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
2,4,6-Trichlorophenol	ND		0.100	2	1	12/14/2018 04:52	WG1209842
(S) 2-Fluorophenol	42.5		10.0-120			12/14/2018 04:52	WG1209842
(S) Phenol-d5	22.3		10.0-120			12/14/2018 04:52	WG1209842
(S) Nitrobenzene-d5	50.2		10.0-127			12/14/2018 04:52	WG1209842
(S) 2-Fluorobiphenyl	59.2		10.0-130			12/14/2018 04:52	WG1209842
(S) 2,4,6-Tribromophenol	70.0		10.0-155			12/14/2018 04:52	WG1209842
(S) p-Terphenyl-d14	66.5		10.0-128			12/14/2018 04:52	WG1209842

- 1
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

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WG1209251

Mercury by Method 7470A

Method Blank (MB)

(MB) R3367412-1 12/12/18 08:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U	0.00330	0.0100	0.0100

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3367412-2 12/12/18 08:25 • (LCSD) R3367412-3 12/12/18 08:27

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	0.0308	0.0306	103	102	80.0-120	0.0308	0.0306	0.657	20

L1050973-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050973-02 12/12/18 08:30 • (MS) R3367412-4 12/12/18 08:37 • (MSD) R3367412-5 12/12/18 08:39

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0297	0.0289	98.9	96.2	1	75.0-125	0.0297	0.0289	2.84	20

L1050955-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050955-06 12/12/18 08:42 • (MS) R3367412-6 12/12/18 08:44 • (MSD) R3367412-7 12/12/18 08:47

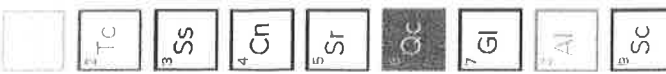
Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0329	0.0315	110	105	1	75.0-125	0.0329	0.0315	4.36	20



QUALITY CONTROL SUMMARY

L1051120-02

ONE LAB. NATIONWIDE.



Method Blank (MB)

(MB) R3367309-1 12/12/18 01:44

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	0.0380	J	0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3367309-2 12/12/18 01:47 • (LCSD) R3367309-3 12/12/18 01:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	9.13	9.14	91.3	91.4	80.0-120			0.137	20
Barium	10.0	9.51	9.54	95.1	95.4	80.0-120			0.304	20
Cadmium	10.0	9.05	9.09	90.5	90.9	80.0-120			0.400	20
Chromium	10.0	9.20	9.25	92.0	92.5	80.0-120			0.588	20
Lead	10.0	9.06	9.11	90.6	91.1	80.0-120			0.531	20
Selenium	10.0	9.11	9.14	91.1	91.4	80.0-120			0.324	20
Silver	2.00	1.77	1.78	88.6	89.2	80.0-120			0.611	20

L1050920-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050920-01 12/12/18 01:52 • (MS) R3367309-5 12/12/18 01:57 • (MSD) R3367309-6 12/12/18 02:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MSD Rec. %	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.43	9.42	94.3	94.2	1	75.0-125		0.0865	0.0865	20
Barium	10.0	11.5	20.9	20.6	94.7	91.0	1	75.0-125		1.75	1.75	20
Cadmium	10.0	ND	9.24	9.27	92.4	92.7	1	75.0-125		0.283	0.283	20
Chromium	10.0	ND	9.21	9.20	92.1	92.0	1	75.0-125		0.189	0.189	20
Lead	10.0	ND	9.05	9.06	90.5	90.6	1	75.0-125		0.0366	0.0366	20
Selenium	10.0	ND	9.45	9.53	94.5	95.3	1	75.0-125		0.862	0.862	20
Silver	2.00	ND	1.81	1.81	90.7	90.7	1	75.0-125		0.00810	0.00810	20



WG1209292

Metals (ICP) by Method 6010B

QUALITY CONTROL SUMMARY

L1051120-02

ONE LAB. NATIONWIDE.

L1050955-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050955-06 12/12/18 02:03 • (MS) R3367309-7 12/12/18 02:05 • (MSD) R3367309-8 12/12/18 02:08

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	10.0	ND	9.25	9.17	92.5	91.7	1	75.0-125			0.877	20
Barium	10.0	ND	9.57	9.53	95.7	95.3	1	75.0-125			0.445	20
Cadmium	10.0	ND	9.12	9.10	91.2	91.0	1	75.0-125			0.206	20
Chromium	10.0	ND	9.23	9.29	92.3	92.9	1	75.0-125			0.654	20
Lead	10.0	ND	9.09	9.06	90.9	90.6	1	75.0-125			0.417	20
Selenium	10.0	ND	9.17	9.15	91.7	91.5	1	75.0-125			0.206	20
Silver	2.00	ND	1.79	1.80	89.4	90.0	1	75.0-125			0.682	20

2 Tc 3 Ss 4 Cn 5 Sr 6 Oc 7 Gf 8 Al 9 Sc



WG1209542

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

QUALITY CONTROL SUMMARY

L1051120-02

ONE LAB. NATIONWIDE.

Method Blank (MB)

(MB) R3368080-3 12/12/18 14:36

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0165	0.0500
Carbon tetrachloride	U		0.0165	0.0500
Chlorobenzene	U		0.0165	0.0500
Chloroform	U		0.0825	0.250
1,2-Dichloroethane	U		0.0165	0.0500
1,1-Dichloroethene	U		0.0165	0.0500
2-Butanone (MEK)	U		0.165	0.500
Tetrachloroethene	U		0.0165	0.0500
Trichloroethene	U		0.0165	0.0500
Vinyl chloride	U		0.0165	0.0500
(S) Toluene-d8	97.5			80.0-120
(S) Dibromofluoromethane	109			75.0-120
(S) a,a-Trifluorotoluene	114			80.0-120
(S) 4-Bromofluorobenzene	98.4			77.0-126

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3368080-1 12/12/18 12:07 • (LCSD) R3368080-2 12/12/18 12:27

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0245	0.0243	97.9	97.2	70.0-123			0.757	20
Carbon tetrachloride	0.0250	0.0284	0.0288	114	115	68.0-126			1.41	20
Chlorobenzene	0.0250	0.0239	0.0267	95.8	107	80.0-121			10.9	20
Chloroform	0.0250	0.0247	0.0257	98.9	103	73.0-120			3.75	20
1,2-Dichloroethane	0.0250	0.0226	0.0231	90.3	92.5	70.0-128			2.41	20
1,1-Dichloroethene	0.0250	0.0274	0.0274	110	110	71.0-124			0.0310	20
2-Butanone (MEK)	0.125	0.105	0.0947	83.7	75.7	44.0-160			10.1	20
Tetrachloroethene	0.0250	0.0237	0.0229	94.9	91.5	72.0-132			3.56	20
Trichloroethene	0.0250	0.0233	0.0243	93.1	97.2	78.0-124			4.28	20
Vinyl chloride	0.0250	0.0269	0.0281	108	112	67.0-131			4.30	20
(S) Toluene-d8				100	105	80.0-120				
(S) Dibromofluoromethane				113	115	75.0-120				
(S) a,a-Trifluorotoluene				111	112	80.0-120				
(S) 4-Bromofluorobenzene				103	96.1	77.0-126				



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WG1209542

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

QUALITY CONTROL SUMMARY

ONE LAB. NATIONWIDE.

L1051120-02

L1051304-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1051304-04 12/12/18 17:17 • (MS) R3368080-4 12/12/18 17:37 • (MSD) R3368080-5 12/12/18 17:58

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	1.25	ND	0.667	1.03	53.4	82.7	1	17.0-158		J3	43.2	27
Carbon tetrachloride	1.25	ND	0.688	1.35	55.1	108	1	23.0-159		J3	64.9	28
Chlorobenzene	1.25	ND	0.819	1.12	65.5	89.9	1	33.0-152		J3	31.4	27
Chloroform	1.25	ND	0.846	1.20	67.7	96.3	1	29.0-154		J3	34.9	28
1,2-Dichloroethane	1.25	ND	0.942	1.08	75.4	86.5	1	29.0-151		J3	13.8	27
1,1-Dichloroethene	1.25	ND	0.511	1.02	40.9	81.9	1	11.0-160		J3	66.8	29
2-Butanone (MEK)	6.25	ND	4.66	5.11	74.5	81.7	1	10.0-160		J3	9.25	32
Tetrachloroethene	1.25	ND	0.530	0.964	42.4	77.2	1	10.0-160		J3	58.1	27
Trichloroethene	1.25	ND	0.583	0.995	46.7	79.6	1	10.0-160		J3	52.1	25
Vinyl chloride	1.25	ND	0.480	0.912	38.4	72.9	1	10.0-160		J3	61.9	27
(S) Toluene-d8					105	93.4		80.0-120				
(S) Dibromofluoromethane					118	119		75.0-120				
(S) o,o-Trifluorotoluene					108	103		80.0-120				
(S) 4-Bromofluorobenzene					104	98.4		77.0-126				



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Method Blank (MB)

(MB) R3367113-1 12/11/18 12:02

Analyte	MB Result mg/kg	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U	0.00350	0.0170
PCB 1221	U	0.00537	0.0170
PCB 1232	U	0.00417	0.0170
PCB 1242	U	0.00318	0.0170
PCB 1248	U	0.00315	0.0170
PCB 1254	U	0.00472	0.0170
PCB 1260	U	0.00494	0.0170
(S) Decachlorobiphenyl	95.3		10.0-135
(S) Tetrachloro-m-xylene	85.3		10.0-139

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCS-D)

(LCS) R3367113-4 12/11/18 15:00 • (LCS-D) R3367113-2 12/11/18 12:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.167	0.242	0.190	145	114	37.0-145			24.1	37
PCB 1016	0.167	0.232	0.191	139	114	36.0-141			19.4	35
(S) Decachlorobiphenyl				92.6	101	10.0-135				
(S) Tetrachloro-m-xylene				110	88.7	10.0-139				

L1050069-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050069-01 12/12/18 12:59 • (MS) R3367459-1 12/12/18 11:32 • (MSD) R3367459-2 12/12/18 11:44

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.214	U	0.0693	0.200	32.5	1	10.0-160		J3	96.9	38
PCB 1016	0.214	U	0.107	0.246	49.9	1	10.0-160		J3	79.0	37
(S) Decachlorobiphenyl				40.2	108		10.0-135				
(S) Tetrachloro-m-xylene				52.7	114		10.0-139				

Sample Narrative:

OS: Duplicate analysis was performed.



WG1209842

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

QUALITY CONTROL SUMMARY

L1051120-02

ONE LAB. NATIONWIDE.

Method Blank (MB)

(MB) R3368148-2 12/14/18 00:04

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U	0.0333	0.100	
2,4-Dinitrotoluene	U	0.0333	0.100	
Hexachlorobenzene	U	0.0333	0.100	
Hexachloro-1,3-butadiene	U	0.0333	0.100	
Hexachloroethane	U	0.0333	0.100	
Nitrobenzene	U	0.0333	0.100	
Pyridine	U	0.0333	0.100	
2-Methylphenol	U	0.0333	0.100	
3&4-Methyl Phenol	U	0.0333	0.100	
Pentachlorophenol	U	0.0333	0.100	
2,4,5-Trichlorophenol	U	0.0333	0.100	
2,4,6-Trichlorophenol	U	0.0333	0.100	
(S) Nitrobenzene-d5	51.0			10.0-127
(S) 2-Fluorobiphenyl	65.4			10.0-130
(S) p-Terphenyl-d14	70.7			10.0-128
(S) Phenol-d5	21.7			10.0-120
(S) 2-Fluorophenol	40.9			10.0-120
(S) 2,4,6-Tribromophenol	61.5			10.0-155

Laboratory Control Sample (LCS)

(LCS) R3368148-1 12/13/18 23:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.275	55.0	18.0-120	
2,4-Dinitrotoluene	0.500	0.383	76.6	49.0-124	
Hexachlorobenzene	0.500	0.388	77.6	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.309	61.8	19.0-120	
Hexachloroethane	0.500	0.275	55.0	15.0-120	
Nitrobenzene	0.500	0.266	53.2	27.0-120	
Pyridine	0.500	0.245	49.0	10.0-120	
2-Methylphenol	0.500	0.283	56.6	28.0-120	
3&4-Methyl Phenol	0.500	0.309	61.8	31.0-120	
Pentachlorophenol	0.500	0.364	72.8	23.0-120	
2,4,5-Trichlorophenol	0.500	0.331	78.2	44.0-120	
2,4,6-Trichlorophenol	0.500	0.371	74.2	42.0-120	
(S) Nitrobenzene-d5			49.6	10.0-127	
(S) 2-Fluorobiphenyl			62.7	10.0-130	
(S) p-Terphenyl-d14			69.0	10.0-128	

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

QUALITY CONTROL SUMMARY

L1051120-02

ONE LAB, NATIONWIDE.

Laboratory Control Sample (LCS)

(LCS) R3368148-1 12/13/18 23:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) Phenol-d5		22.5	10.0-120		
(S) 2-Fluorophenol		39.1	10.0-120		
(S) 2,4,6-Tribromophenol		80.5	10.0-155		

L1050973-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050973-02 12/14/18 00:28 • (MS) R3368148-3 12/14/18 00:52 • (MSD) R3368148-4 12/14/18 01:16

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.148	0.204	29.6	40.8	1	17.0-120		31.8	40	
2,4-Dinitrotoluene	0.500	ND	0.292	0.346	58.4	69.2	1	39.0-125		16.9	25	
Hexachlorobenzene	0.500	ND	0.247	0.349	49.4	69.8	1	35.0-122	J3	34.2	24	
Hexachloro-1,3-butadiene	0.500	ND	0.186	0.249	37.2	49.8	1	12.0-120		29.0	34	
Hexachloroethane	0.500	ND	0.147	0.201	29.4	40.2	1	10.0-120		31.0	40	
Nitrobenzene	0.500	ND	0.159	0.204	31.8	40.8	1	12.0-120		24.8	30	
Pyridine	0.500	ND	0.114	0.128	22.8	25.6	1	10.0-120		11.6	37	
2-Methylphenol	0.500	ND	0.186	0.220	37.2	44.0	1	10.0-120		16.7	30	
3&4-Methyl Phenol	0.500	ND	0.208	0.237	41.6	47.4	1	10.0-120		13.0	36	
Pentachlorophenol	0.500	ND	0.257	0.358	51.4	71.6	1	10.0-128		32.8	37	
2,4,5-Trichlorophenol	0.500	ND	0.262	0.336	52.4	67.2	1	33.0-120		24.7	31	
2,4,6-Trichlorophenol	0.500	ND	0.242	0.317	48.4	63.4	1	26.0-120		26.8	31	
(S) Nitrobenzene-d5					29.4	39.0		10.0-127				
(S) 2-Fluorobiphenyl					40.4	53.0		10.0-130				
(S) p-Terphenyl-d14					57.2	64.3		10.0-128				
(S) Phenol-d5					15.8	17.7		10.0-120				
(S) 2-Fluorophenol					26.0	30.6		10.0-120				
(S) 2,4,6-Tribromophenol					46.9	70.0		10.0-155				



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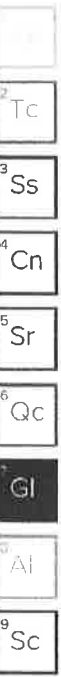


Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.



Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.

