Midwest Laboratories, Inc.®
13611 B Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121 • www.midwestlabs.com

Lab # 8947992 **Report of Analysis** Report Number: 21-228-4111

Account: 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352
Date Sampled:	2021-08-03
Date Received:	2021-08-04
Sample ID:	COR Finished Compost Rows 12-23

Robert Ferris
Account Manager
402-829-9871

City of Richland Finished Compost 8
Rows 12-23

		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
NUTRIENTS				
Nitrogen				
Total Nitrogen	%	1.70	2.19	34.0
Organic Nitrogen	%	1.49	1.92	29.8
Ammonium Nitrogen	%	0.209	0.269	4.2
Nitrate Nitrogen	%	< 0.01	----	----
Major and Secondary Nutrients				
Phosphorus	%	0.41	0.53	8.2
Phosphorus as P2O5	%	0.94	1.21	18.8
Potassium	%	0.55	0.71	11.0
Potassium as K2O	%	0.66	0.85	13.2
Sulfur	%	0.24	0.31	4.8
Calcium	%	1.98	2.55	39.6
Magnesium	%	0.40	0.51	8.0
Sodium	%	0.070	0.090	1.4
Micronutrients				
Iron	ppm	14800	19028	29.6
Manganese	ppm	198	255	0.4
Boron	ppm	< 100	----	----
OTHER PROPERTIES				
Moisture	%	22.22		
Total Solids	%	77.78		1555.6
Organic Matter	%	45.30	58.24	906.0
Ash	%	31.50	40.50	630.0
Total Carbon	%	22.32	28.70	
Chloride	%	0.10	0.13	
pH		7.3		
Conductivity 1:5 (Soluble Salts)	mS/cm	4.22		

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Lab # 8947992 **Biological & Physical Properties** Report Number: 21-228-4111

Account: 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352
Date Sampled:	2021-08-03
Date Received:	2021-08-04
Sample ID:	COR Finished Compost Rows 12-23

Robert Ferris
Client Service Representative
402-829-9871

City of Richland Finished Compost 8
Rows 12-23

	Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method
Biological Properties					
Germination	100		%	1	TMECC 05.05A
Germination Vigor	89.1		%	1	TMECC 05.05A
CO_2 OM Evolution	0.67		$mgCO_2$-C/gOM/day	0.01	TMECC 05.08B
CO_2 Solids Evolution	1.59		$mgCO_2$-C/gTS/day	0.01	TMECC 05.08B
Salmonella		< 0.26	mpn/4g	0.26	EPA 1682
Stability Rating	Stable		N/A	N/A	TMECC 05.08B
Physical Properties					
Bulk Density (Loose)	337		lbs/cu yard	1	WT/VOL
Bulk Density (Packed)	556		lbs/cu yard	1	WT/VOL
Film Plastics	n.d.		%	0.25	Microscopic
Glass Fragments	n.d.		%	0.25	Microscopic
Hard Plastics	n.d.		%	0.25	Microscopic
Metal Fragment	n.d.		%	0.25	Microscopic
Sharps	Absent		---	---	Microscopic
Max. Particle Length		2.5	inches	N/A	TMECC Sieve
Sieve % Passing 3"		100	%	0.01	TMECC Sieve
Sieve % Passing 2"		100	%	0.01	TMECC Sieve
Sieve % Passing 1.5"		100	%	0.01	TMECC Sieve
Sieve % Passing 1"		100	%	0.01	TMECC Sieve
Sieve % Passing 3/4"		100	%	0.01	TMECC Sieve
Sieve % Passing 5/8"		100	%	0.01	TMECC Sieve
Sieve % Passing 3/8"		100	%	0.01	TMECC Sieve
Sieve % Passing 1/4"		97	%	0.01	TMECC Sieve

Compost Results Interpretations

Page 1

Report #:	21-228-4111
DATE RECEIVED:	2021-08-04

Organic Matter %

45.30	As Received
58.24	Dry Weight

Greater than 20% indicates a desirable range for compost on a dry weight basis.

Compost is a significant source of Organic Matter, which is an important supplier of carbon. Organic Matter improves soil and plant efficiency by improving soil physical properties, providing a source of energy to beneficial organisms, and enhancing the reservoir of soil nutrients.

C/N Ratio

13.1:1

20-30 indicates an ideal range for the initial compost process.

10-20 indicates an ideal range for a finished compost.

All organic matter is made up of substantial amounts of carbon with lesser amounts of nitrogen. The balance of these two elements is called the Carbon/Nitrogen Ratio. For the best performance, the compost pile requires the correct proportion of carbon for energy and nitrogen for protein production. If the C:N ratio is too high (excess carbon) decomposition slows down. If the C:N ratio is too low (excess Nitrogen) the compost pile could be difficult to manage.

Moisture %

22.22

<35% = Indicates overly dry compost

>55% = Indicates overly wet compost

Moisture Percent is the measure of water present in the compost and expressed as a percentage of total weight. Moisture present affects handling and transport. Overly dry will be light and dusty while overly wet will be heavy and clumpy. A desirable moisture content of finished compost will range between 40 to 50%.

Compost Results Interpretations

Page 2

Report #:	21-228-4111
DATE RECEIVED:	2021-08-04

Conductivity or Soluble Salts measures the conductance of electrical current in a liquid compost slurry. Excessive soluble salt content in a compost can prevent or delay seed germination and proper root growth. Conductivity analysis is done on a 1:5 basis.

Conductivity 1:5
4.2

Conductivity Level	**Interpretation**
Greater than 10	Very High nutrient content. Use for Ag Applications
5 - 10	High nutrient content. Use for Ag Applications
3 - 5	Higher than desirable for salt sensitive plants, some loss of vigor
0.6 - 3	Desirable range for most plants
0.3 - 0.6	Ideal range for greenhouse growth media
0.0 - 0.3	Very Low: Indicates very low nutrient status: plants may show deficiencies.

Compost Results Interpretations

Page 3

Report #: 21-228-4111

DATE RECEIVED: 2021-08-04

pH Value

7.3

0 to 14 scale with 6 to 8 as normal pH levels for compost

A pH in the 6 to 8 pH range indicates a more mature compost

pH measures the acidity or alkalinity of the compost, and is a measurement of the hydrogen ion activity of a soil or compost on a logarithmic scale. The pH scale ranges from 0 to 14 and 7 indicates a neutral pH. Growing media with a higher pH or pH greater than 7 can benefit from a compost that has a more acidic pH or pH below 7. This type of application will possibly lower the soil pH making the soil more conducive to plants that thrive in a more acidic soil condition.

Nutrient Index (Ag Index)

>10

The Nutrient Index normally runs between 1 and 10.

The Nutrient Index is obtained by dividing the total nutrients (N,P,K) by the amount of salt (Sodium and Chloride). The higher the Nutrient Index the less chance of having a toxic buildup of Sodium (salt) in the soil.

AG INDEX CHART

salt injury possible	*use on soils with excellent drainage characteristics, good water quality and low salts*				*you may use on soils with poor drainage, poor water quality, or high salts*					*for all soils*
1	2	3	4	5	6	7	8	9	10	> 10

Nutrients (N+P205+K20)

4.24 Average Nutrient Content Dry Weight <2 = Low, >5 = High

1.5-1-0.5 Rating As Received

The most commonly used compost data is the amount of Nitrogen, Phosphate, and Potash (abbreviated as N,P,K) present and the information is similar to that found in common fertilizers. If a compost result has the rating 1-2-2 it means that the compost has 1% Nitrogen, 2% Phosphate and 2% Potash. Most compost tests will have a average nutrient level (N+P+K) of < 5%.

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CITY OF RICHLAND
DOUG BULLOCK
PO BOX 190
RICHLAND WA 99352

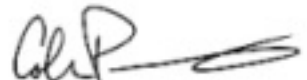
REPORT OF ANALYSIS

For: (27791) CITY OF RICHLAND
City of Richland Finished Compost 8/3/21
Rows 12-23
TBD

Analysis	Level Found As Received	Level Found Dry Weight	Units	Reporting Limit	Method	Analyst-Date	Verified-Date
Sample ID: **COR Finished Compost Rows 12-23**	Lab Number: **8947992**		Date Sampled: **2021-08-03 1129**				
Cadmium (total)	n.d.	n.d.	mg/kg	0.50	EPA 6010	ery3-2021/08/05	trh1-2021/08/09
Chromium (total)	18.4	23.7	mg/kg	1.00	EPA 6010	ery3-2021/08/05	trh1-2021/08/09
Mercury (total)	0.11	0.14	mg/kg	0.05	EPA 7471	pjd8-2021/08/09	trh1-2021/08/09
Lead (total)	7.4	9.5	mg/kg	5.0	EPA 6010	ery3-2021/08/05	trh1-2021/08/09
Molybdenum (total)	4.0	5.2	mg/kg	1.0	EPA 6010	ery3-2021/08/05	trh1-2021/08/09
Nickel (total)	14.0	18.0	mg/kg	1.0	EPA 6010	ery3-2021/08/05	trh1-2021/08/09
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	ery3-2021/08/05	trh1-2021/08/09
Zinc (total)	170.2	218.8	mg/kg	2.0	EPA 6010	ery3-2021/08/05	trh1-2021/08/09
Copper (total)	98.8	127	mg/kg	1	EPA 6010	ery3-2021/08/05	trh1-2021/08/09
Arsenic (total)	4.97	6.39	mg/kg	0.5	EPA 6020	pjd8-2021/08/09	trh1-2021/08/09

EPA 1682 holding time of < 6 hours from sampling to laboratory set up of samples for biosolids and compost has been exceeded. If a level of Salmonella was reported, the value would be considered an estimate. Individual states enforce different holding times for compost or biosolids so please contact the regulatory body in your state for their requirements.
n.d. = not detected , ppm = parts per million, ppm = mg/kg

For questions please contact:



Cole C Parsons
Account Manager
cparsons@midwestlabs.com (402)829-9850

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8947992-992
Samples: 1 Page: 1/2
Margarito Pena
2021 08 04 11:41

SUBMITTAL FORM

Order Number: 974774
Order Date: 2021-08-03 15:13:41
Submitted By: Toby Billings

Account: 27791
CITY OF RICHLAND
PO BOX 190
RICHLAND, WA 99352

Sample Description: City of Richland Finished Compost 8/3/21
Sample Description 2: Rows 12-23
Project/PO Number: TBD
Comment: Will send PO

14.4 mp

SAMPLES FOR ANALYSIS

Compost

974774-1 Date Sampled: 2021-08-03 **8947992**
Sample ID: COR Finished Compost Rows 12-23
Time Sampled: 1129

Comment: G/C

Analysis Requested:

Salmonella *(Salmonella, Percent solids)*

STA w/o Fecal *(Carbon (total), Loss on ignition (OM), Nitrogen (total), Ammonium nitrogen (total), Germination vigor, Sieve (ret) 3-8 in. 9.25 mm, Salmonella, CO2 OM Evolution, CO2 Solids Evolution, Stability rating, % passing - 3" sieve (DW), % passing - 3/4" sieve (DW), % passing - 1" sieve (DW), % passing - 1.5" sieve (DW), % passing - 1/4" sieve (DW), Sieve maximum particle length (Inches), Cadmium (total), Chromium (total), Mercury (total), Lead (total), Molybdenum (total), Nickel (total), Germination, % passing - 5/8" sieve (DW), Conductivity 1:5 dilution, Sulfur (total), Magnesium (total), Iron (total), Calcium (total), Sodium (total), Manganese (total), Bulk density (packed), Bulk density (loose), Film plastic, Glass fragments, Hard plastic, Metal fragments, Sharps, Chloride, Boron (total), Phosphate (P2O5), Nitrate-nitrogen, Ash, Moisture, % passing - 2" sieve (DW), Selenium (total), Zinc (total), Potash (K2O), Copper (total), Arsenic (total), pH)*

SUBFORM NUMBER:
931163

ORDER NUMBER:
173425

8947992-992
Samples: 1 Page: 2/2
Marjorie Pena
2021 08 04 11:41

ACCOUNT NO: 27791
CITY OF RICHLAND
~~DOUG BULLOCK~~ Toby Billings
~~PO BOX 190~~ 625 Swift Blvd MS29
RICHLAND, WA 99352

SAMPLE DESCRIPTION
STA WO ~~SALMONELLA~~ Fecal + Salmonella

COPY TO:

PO NUMBER:

Automatic Order Submittal Form

PLACED BY: Cole C Parsons

	SAMPLE ID	DATE/TIME SAMPLED	MATRIX	TESTS REQUESTED	CONTAINER COUNT	COMMENTS
1	CoR FC 8/3/21 Rows 12-23	8/3/21 11:29	S	Fecal STA WO ~~SALMONELLA~~ + Salmonella	1	G/C Row 13/15/17/19/22
2						
3						
4						
5						
6						
7						
8						
9						
10						

Sampled by:(Signature)	Temp on Arrival	Cooler arrived intact?	Relinquished by(Signature)	Date/Time	Received by(Signature)
Relinquished by(Signature)	**Date/Time**	**Received by(Signature)**	**Relinquished by(Signature)**	**Date/Time**	**Received in lab by(Signature)**
	8/3/21 1320				

CHAIN OF CUSTODY