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

Lab # 8884489 **Report of Analysis** Report Number: 21-098-4110

Account: 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352
Date Sampled:	2021-03-24
Date Received:	2021-03-25
Sample ID:	FINISHED COMPOST (UNSCREENED)

Robert Ferris
Account Manager
402-829-9871

STA ANALYSIS

		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
NUTRIENTS				
Nitrogen				
Total Nitrogen	%	1.90	2.46	38.0
Organic Nitrogen	%	1.68	2.18	33.7
Ammonium Nitrogen	%	0.196	0.254	3.9
Nitrate Nitrogen	%	0.02	0.03	0.4
Major and Secondary Nutrients				
Phosphorus	%	0.45	0.58	9.0
Phosphorus as P2O5	%	1.03	1.34	20.6
Potassium	%	0.89	1.15	17.8
Potassium as K2O	%	1.07	1.39	21.4
Sulfur	%	0.27	0.35	5.4
Calcium	%	1.85	2.40	37.0
Magnesium	%	0.41	0.53	8.2
Sodium	%	0.080	0.104	1.6
Micronutrients				
Iron	ppm	9790	12695	19.6
Manganese	ppm	180	233	0.4
Boron	ppm	< 100	----	----
OTHER PROPERTIES				
Moisture	%	22.88		
Total Solids	%	77.12		1542.4
Organic Matter	%	42.60	55.24	852.0
Ash	%	33.90	43.96	678.0
Total Carbon	%	21.02	27.26	
Chloride	%	0.22	0.29	
pH		7.3		
Conductivity 1:5 (Soluble Salts)	mS/cm	5.39		

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

Lab # 8884489 **Biological & Physical Properties** Report Number: 21-098-4110

Account: 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352
Date Sampled:	2021-03-24
Date Received:	2021-03-25
Sample ID:	FINISHED COMPOST (UNSCREENED)

Robert Ferris
Client Service Representative
402-829-9871

STA ANALYSIS

	Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method
Biological Properties					
Germination	100		%	1	TMECC 05.05A
Germination Vigor	88.5		%	1	TMECC 05.05A
CO_2 OM Evolution	0.58		$mgCO_2$-C/gOM/day	0.01	TMECC 05.08B
CO_2 Solids Evolution	1.09		$mgCO_2$-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)	640		lbs/cu yard	1	WT/VOL
Bulk Density (Packed)	826		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		1.0	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"		99	%	0.01	TMECC Sieve
Sieve % Passing 1/4"		94	%	0.01	TMECC Sieve

Compost Results Interpretations

Page 1

Report #:	21-098-4110
DATE RECEIVED:	2021-03-25

Organic Matter %

42.60 As Received

55.24 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

11.1:1

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 %

22.88

<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 #:	21-098-4110
DATE RECEIVED:	2021-03-25

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
5.4

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 #: 21-098-4110

DATE RECEIVED: 2021-03-25

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)

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

2-1-1 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%.

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

CITY OF RICHLAND
DOUG BULLOCK
PO BOX 190
RICHLAND WA 99352

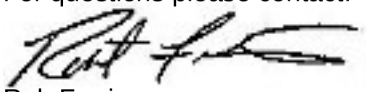
REPORT OF ANALYSIS

For: (27791) CITY OF RICHLAND
STA ANALYSIS

Analysis	Level Found As Received	Level Found Dry Weight	Units	Reporting Limit	Method	Analyst-Date	Verified-Date
Sample ID: **FINISHED COMPOST (UNSCREENED)**	Lab Number: **8884489**			Date Sampled: **2021-03-24 1000**			
Cadmium (total)	0.72	0.94	mg/kg	0.50	EPA 6010	ery3-2021/03/29	trh1-2021/03/31
Chromium (total)	10.6	13.8	mg/kg	1.00	EPA 6010	ery3-2021/03/29	trh1-2021/03/31
Mercury (total)	0.08	0.11	mg/kg	0.05	EPA 7471	pjd8-2021/03/30	trh1-2021/03/31
Lead (total)	7.6	9.9	mg/kg	5.0	EPA 6010	ery3-2021/03/29	trh1-2021/03/31
Molybdenum (total)	3.6	4.6	mg/kg	1.0	EPA 6010	ery3-2021/03/29	trh1-2021/03/31
Nickel (total)	14.0	18.1	mg/kg	1.0	EPA 6010	ery3-2021/03/29	trh1-2021/03/31
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	ery3-2021/03/29	trh1-2021/03/31
Zinc (total)	168.0	217.8	mg/kg	2.0	EPA 6010	ery3-2021/03/29	trh1-2021/03/31
Copper (total)	86.4	112	mg/kg	1	EPA 6010	ery3-2021/03/29	trh1-2021/03/31
Arsenic (total)	3.47	4.50	mg/kg	0.5	EPA 6020	ras7-2021/03/31	trh1-2021/03/31

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:



Rob Ferris
Account Manager
rferris@midwestlabs.com (402)829-9871

US COMPOSTING COUNCIL

8884489-489
Samples: 1 Page: 1/3
Ashlyn Himan 2021 03 25 11:16

OFFICIAL Seal of Testing Assurance
Compost Sample Chain of Custody Form

STA Laboratory: Midwest Laboratories Tel: (402) 334-7770
Address: 13611 B St. FAX: (402) 334-9121
Email:
City, State Zip code: Omaha, Nebraska 68144-3693

Client/Reporting Company: City of Richland Tel: (509) 942-7481
Contact Name: Steve Brewer FAX: (509) 942-7346
Billing Address: 625 Swift Blvd. MS # 27 Email: SBREWER@CI.Richland.Wa.US
City, State Zip code: Richland, Wa 99352
Send Results to: Steve Brewer 625 Swift Blvd. MS # 27
City, State Zip code: Richland Wa 99352
Name or Source of Sample(s): City of Richland Compost Facility
Name of Person(s), Sample Collector(s): DAVID BUCKLOCK

LABORATORY USE ONLY Storage Locations
Freezer ____ Cold Room ____ Storage Shelf ____
Sample Condition: ____
Temperature: ____ Melodor: ____ Moisture: ____
Sample Type: O POINT O COMPOSITE O STRATIFIED O INTERVAL
P.O. Number: ____
USCC Member: O YES O NO

SELECTION OF ANALYSIS. Refer to http://www.tmecc.org/cap/methods.html for details. STA Suite; State DOT Tests (indicate State); A, B, C – Specify other tests in fields A through C, (e.g., tests required for regulated samples, etc.). NOTE ! STA analytical results via the STA Compost Technical Data Sheet and this Chain of Custody form are submitted to STA program management.

A	B	C

Client Sample ID and Special Instructions	1. List Feedstocks 2. Check all that apply 3. List % by volume. (Optional)		Collection Date/Time	Sample Matrix	Composting Operation Type	Shipping Temperature	Indicate Compost Analysis Requirements (*identify state)	LAB USE ONLY Job Number & Sample Status
FINISHED COMPOST (UNSCREENED)	X Green waste	Carcass	Date: 3-24-21	Compost ●	Windrow ●	Ambient O	STA Suite / State DOT / Identify State: A B C	
	Manure	Fish Waste	Time: GRAB COMP 1000 HR	Feedstock O	Static pile O	Wet Ice ●		
	Food	Grease, Fats		Mulch O	In-Vessel O	Dry Ice O		
	X Biosolids		Initials: DR	____ O	____ O			
	MSW			____ O	____ O			
	Wood							

INFORM THE STA LABORATORY AND SPECIFY THE REQUIRED LABORATORY TESTS WHEN SUBMITTING REGULATED COMPOST SAMPLES (please use spaces A, B and C provided above).

PLEASE PROVIDE SPECIFIC FEEDSTOCK AND OPERATIONAL DETAIL IN THE SPACE PROVIDED.
YOUR VOLUNTEERED INFORMATION PROVIDES USCC STANDARDS AND PRACTICES COMMITTEE WITH CRUTIAL DATA NEEDED TO BETTER UNDERSTAND THE COMPOSTING PROCESS AND COMPOST END USES.

SALMONELLA ONLY (NO FECAL COLIFORM) ANALYSIS → WA. & ORE.

8884489

		Date	Time		Date	Time
Releasing Signature 1	Doug Buckloch	3-24-21	1300	Receiving Signature 1		
Releasing Signature 2				Receiving Signature 2		
Releasing Signature 3				Receiving Signature 3		
Releasing Signature 4				Receiving Signature 4		

9.3 aa

Regulatory

8884489-489
Samples: 1 Page: 2/3
Ashlyn Hinman
2021 08 26 11:16

Midwest Laboratories®

This sheet **MUST** be filled out before samples can be processed. To ensure that holding times are met, it is your responsibility that a completed form comes attached to the Chain of Custody. Samples must be received on ice.

Is this sample for regulatory/permit reporting? ☒ Yes ☐ No

What city/state was your sample collected in? RICHLAND, WA.

What agency/state are you reporting? WA COMPOSTING COUNCIL

What type of sample? (Circle One)

Drinking Water For human consumption, 30 hr hold time	**Ground Water**	**Wastewater**
Solid Waste	**Hazardous Waste**	**UST**
Storm Water	**Process Water**	**Livestock** COMPOST

SEE REVERSE SIDE FOR SAMPLING INSTRUCTIONS

RC FORM 14-4 Effective 9.13.19

Midwest Laboratories®

8884489-489
Samples: 1 Page: 3/3
Ashlyn Himan
2021 03 25 11:16

Sample Acceptance Checklist

Document Number: RC CHKLIST 001
Revision No.: 4
Effective Date: 1/31/2019

Lab Number:

Thermometer Used: ☑ Therm Fisher IR 2

Sample Temperature (°C): 9.3

Cooler Intact: ☑ Yes ☐ No
Received on Ice: ☑ Yes ☐ No
Hand Delivered: ☐ Yes ☑ No

Date & Initials of person accepting samples: aa 3/25/21

						Comments
Chain of Custody present?	☑	Yes	☐	No	☐	N/A	
Sample ID(s):	☑	Yes	☐	No	☐	N/A	
Sample Location(s):	☑	Yes	☐	No	☐	N/A	
Client contact:	☑	Yes	☐	No	☐	N/A	
Analysis Requested:	☑	Yes	☐	No	☐	N/A	
Date & Time of collection:	☑	Yes	☐	No	☐	N/A	
Sampler name on COC?	☑	Yes	☐	No	☐	N/A	
Chain of custody relinquished with signature?	☑	Yes	☐	No	☐	N/A	
Chain of custody complete?	☑	Yes	☐	No	☐	N/A	
Sample labels match COC?	☑	Yes	☐	No	☐	N/A	
Written in indelible ink?	☑	Yes	☐	No	☐	N/A	
Labels indicate proper preservation?	☑	Yes	☐	No	☐	N/A	
Samples arrived within hold time?	☐	Yes	☑	No	☐	N/A	16 hr hold for sal aa 3/25/21
Samples arrived within correct temperature?	☑	Yes	☐	No	☐	N/A	
Sufficient volume?	☑	Yes	☐	No	☐	N/A	
Appropriate containers used?	☑	Yes	☐	No	☐	N/A	
Filtered volume received for dissolved tests?	☐	Yes	☐	No	☑	N/A	
Headspace in VOA vials?	☐	Yes	☐	No	☑	N/A	
Trip Blank present?	☐	Yes	☑	No	☐	N/A	

Client Notification/Resolution: Date/Time Contacted: _____

Person Contacted: _____ Contacted By: _____

Comments/Resolution: _____