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Lab #	2804783	Report of Analysis		Report Number: 18-141-4060	
Account: 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352		 Robert Ferris Account Manager 402-829-9871		
Date Sampled: Date Received: Sample ID:	2018-05-02 2018-05-03 FC ROW 1127-17				
			COMPOST FACILITY		
			Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
NUTRIENTS					
Nitrogen					
Total Nitrogen	%	1.77	3.01	35.4	
Organic Nitrogen	%	1.68	2.85	33.5	
Ammonium Nitrogen	%	0.075	0.127	1.5	
Nitrate Nitrogen	%	0.02	0.03	0.4	
Major and Secondary Nutrients					
Phosphorus	%	0.75	1.27	15.0	
Phosphorus as P2O5	%	1.72	2.92	34.4	
Potassium	%	0.91	1.55	18.2	
Potassium as K2O	%	1.10	1.87	22.0	
Sulfur	%	0.35	0.59	7.0	
Calcium	%	2.30	3.91	46.0	
Magnesium	%	0.51	0.87	10.2	
Sodium	%	0.100	0.170	2.0	
Micronutrients					
Iron	ppm	6770	11502	13.5	
Manganese	ppm	142	241	0.3	
Boron	ppm	< 100	---	---	
OTHER PROPERTIES					
Moisture	%	41.14			
Total Solids	%	58.86	1177.2		
Organic Matter	%	33.80	57.42	676.0	
Ash	%	24.20	41.11	484.0	
Total Carbon	%	18.15	30.84		
Chloride	%	0.17	0.29		
pH		6.9			
Conductivity 1:5 (Soluble Salts)	mS/cm	5.4			

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Lab #	2804783	Biological & Physical Properties			Report Number: 18-141-4060
Account: 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352			 Robert Ferris Client Service Representative 402-829-9871	
Date Sampled:	2018-05-02			COMPOST FACILITY	
Date Received:	2018-05-03				
Sample ID:	FC ROW 1127-17				
	Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method
Biological Properties					
Germination	100		%	1	TMECC 05.05A
Germination Vigor	100		%	1	TMECC 05.05A
CO ₂ OM Evolution	0.21		mgCO ₂ -C/gOM/day	0.01	TMECC 05.08B
CO ₂ Solids Evolution	0.37		mgCO ₂ -C/gTS/day	0.01	TMECC 05.08B
Fecal Coliform		< 0.2	mpn/g	0.2	EPA 1681
Stability Rating	Stable		N/A	N/A	TMECC 05.08B
Physical Properties					
Bulk Density (Loose)	741		lbs/cu yard	1	WT/VOL
Bulk Density (Packed)	927		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		1.4	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"		93	%	0.01	TMECC Sieve

Compost Results Interpretations

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 DATE RECEIVED: 2018-05-03

Organic Matter %		Greater than 20% indicates a desirable range for compost on a dry weight basis.
33.80	As Received	
57.42	Dry Weight	

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		20-30 indicates an ideal range for the initial compost process. 10-20 indicates an ideal range for a finished compost.
10.3:1		

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 %		<35% = Indicates overly dry compost >55% = Indicates overly wet compost
41.14		

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

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DATE RECEIVED:

2018-05-03

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
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pH Value
6.9

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

Nutrients (N+P205+K20)
7.80 Average Nutrient Content Dry Weight <2 = Low, >5 = High
2-1.5-1 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 an average nutrient level (N+P+K) of < 5%.

18-141-4060

REPORT DATE
May 21, 2018
 RECEIVED DATE
May 03, 2018

SEND TO
27791



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ISSUE DATE
May 21, 2018

**CITY OF RICHLAND
 DOUG BULLOCK
 PO BOX 190
 RICHLAND WA 99352**

REPORT OF ANALYSIS
 For: (27791) CITY OF RICHLAND
 COMPOST FACILITY

Sample ID: **FC ROW 1127-17** Lab Number: **2804783** Date Sampled: **2018-05-02**

Analysis	Level Found		Reporting			Analyst- Date	Verified- Date
	As Received	Dry Weight	Units	Limit	Method		
Cadmium (total)	n.d.	n.d.	mg/kg	0.50	EPA 6010	ras7-2018/05/07	bab2-2018/05/09
Chromium (total)	9.06	15.4	mg/kg	1.00	EPA 6010	ras7-2018/05/07	bab2-2018/05/09
Mercury (total)	0.16	0.27	mg/kg	0.05	EPA 7471	cjm4-2018/05/08	bab2-2018/05/09
Lead (total)	7.2	12.2	mg/kg	5.0	EPA 6010	ras7-2018/05/07	bab2-2018/05/09
Molybdenum (total)	3.5	5.9	mg/kg	1.0	EPA 6010	ras7-2018/05/07	bab2-2018/05/09
Nickel (total)	12.9	21.9	mg/kg	1.0	EPA 6010	ras7-2018/05/07	bab2-2018/05/09
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	ras7-2018/05/07	bab2-2018/05/09
Zinc (total)	212.2	360.5	mg/kg	2.0	EPA 6010	ras7-2018/05/07	bab2-2018/05/09
Copper (total)	118	201	mg/kg	1	EPA 6010	ras7-2018/05/07	bab2-2018/05/09
Arsenic (total)	2.71	4.60	mg/kg	0.5	EPA 6020	ras7-2018/05/09	bab2-2018/05/09

EPA 1681 holding time of < 24 hours from sampling to laboratory set up of samples for biosolids and compost has been exceeded. 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, mg/kg

For questions please contact:

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

The result(s) issued on this report only reflect the analysis of the sample(s) submitted.

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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: P.O. Box 190 Email: SABREWER@CI.
MS # 27 Richland, WA, US
 City, State Zip code: Richland, WA 99352

Send Results to: Steve Brewer
 City, State Zip code: P.O. Box 190 MS#27 Richland, WA 99352

Name or Source of Sample(s): City of Richland Compost Facility
 Name of Person(s), Sample Collector(s): Kasey Brunton

LABORATORY USE ONLY Storage Locations
 Freezer _____ Cold Room _____ Storage Shelf _____

Sample Condition: _____
 Temperature: _____ Malodor: _____ Moisture: _____

Sample Type: POINT COMPOSITE STRATIFIED INTERVAL
 P.O. Number: _____

USCC Member: YES 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
FC Row 1127-17	<input checked="" type="checkbox"/> Green waste <input type="checkbox"/> Manure <input type="checkbox"/> Food <input checked="" type="checkbox"/> Biosolids <input type="checkbox"/> MSW <input type="checkbox"/> Wood <input type="checkbox"/> Carcass <input type="checkbox"/> Fish Waste <input type="checkbox"/> Grease, Fats	Date: <u>5/2/18</u> Time: <u>GRAB COMP</u> Initials: <u>KB</u>	<input checked="" type="checkbox"/> Compost <input type="checkbox"/> Feedstock <input type="checkbox"/> Mulch	<input checked="" type="checkbox"/> Windrow <input type="checkbox"/> Static pile <input type="checkbox"/> In-Vessel	<input type="checkbox"/> Ambient <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Dry Ice	STA Suite State DOT Identify State A B C	2804783

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.

STA W/O SALMONELLA (WANT FECAL COLIFORM TEST PERFORMED) → WASH. & ORE.

Releasing Signature 1	<u>[Signature]</u>	Date	Time	Receiving Signature 1	<u>[Signature]</u>	Date	Time
Releasing Signature 2		Date	Time	Receiving Signature 2		Date	Time
Releasing Signature 3		Date	Time	Receiving Signature 3		Date	Time
Releasing Signature 4		Date	Time	Receiving Signature 4		Date	Time

9-2-18

2004783-783
Samples: Page:
1 2/3
Ashlyn Himen
2018 05 03 10:37

Regulatory

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 to? US Compost Council

What type of sample? (Circle One)

Drinking Water	Ground Water	Wastewater
Solid waste	Hazardous Waste	UST
Storm Water	Process Water	<u>Compost</u>

SEE REVERSE SIDE FOR SAMPLING INSTRUCTIONS



Sample Acceptance Checklist

Document Number: RC CHKLIST 001

Revision No.: 3

Effective Date: 1/31/17

Page 1 of 1



Lab Number: _____

Thermometer Used: Therm Fisher IR 13

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

Sample Temperature (°C): 9.75

Date & Initials of person accepting samples: HA 5/3/18

Comments:

Chain of Custody present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Chain of Custody complete?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Sample ID(s):	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Sample Location(s):	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Client Contact:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Analysis Requested:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Sampler name on COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Date & Time of collection:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Sample labels match COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Written in indelible ink?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Labels indicate proper preservation?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Chain of Custody relinquished with signature?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Samples arrived within hold time?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Sufficient volume?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Appropriate containers used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Headspace in VOA vials?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Trip Blank present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	

Client Notification/Resolution: _____ Date/Time Contacted: _____

Person Contacted: _____ Contacted By: _____

Comments/Resolution: _____

