

Client: City of Gustavus Attn: Paul Berry P.O. Box 1 Gustavus, AK 99826 907-697-2136	Product: Gustavus AK 2020-04-06 Date Sampled: 04/06/20 Date Received: 04/09/20 Invoice #: C20-409	Date Reported: 04/20/20 Laboratory # C20-409 Revealed by Brent Thyssen, CPSSc Job: Amount: \$240.00
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Nutrients

Method	As Received	Dry Wt.	Units	Low	Normal	High	Typical Range
Moisture	70 C	61		*****			15 to 40
Solids	70 C	39		*****			60 to 85
pH	1:5	7.3	NA	SU *****			5.5 to 8.5
E.C. (Sol. Salts)	1:5	1.02	2.63	mmhos/cm *****			below 5.0
Total N	TMECC 04.02D	0.91	2.34	%			1 to 5
Organic C	TMECC 04.01A	11.7	30.2	%			18 to 45
Organic Matter	TMECC 05.07A	19.8	50.9	%			40 to 60
Ash	550 C	19.0	49.1	%			40 to 60
Ammonium -N	TMECC 05.02C	118	304	mg/kg *****			90 to 450
Nitrate-N	TMECC 04.02B	122	314	mg/kg *****			50 to 250
Phosphorous	TMECC 04.12B/04.14A	0.19	0.50	%			
P₂O₅	calculation	0.44	1.14	%			1 to 8
Potassium	TMECC 04.12B/04.14A	0.23	0.60	%			
K₂O	calculation	0.28	0.72	%			3 to 12
Calcium	TMECC 04.12B/04.14A	1.53	3.9	%			0.5 to 10
Magnesium	TMECC 04.12B/04.14A	0.17	0.44	%			0.05 to 0.7
Sodium	TMECC 04.12B/04.14A	0.18	0.45	%			0.05 to 0.7
Sulfur	TMECC 04.12B/04.14A	0.11	0.28	%			0.1 to 1.0
Boron	TMECC 04.12B/04.14A	2.6	6.7	mg/kg *****			25 to 150
Zinc	TMECC 04.12B/04.14A	26	67	mg/kg *****			100 to 600
Manganese	TMECC 04.12B/04.14A	76	196	mg/kg *****			250 to 750
Copper	TMECC 04.12B/04.14A	8.7	22.5	mg/kg *****			100 to 500
Iron	TMECC 04.12B/04.14A	3904	10060	mg/kg *****			1000 to 25000
C/N ratio		13	ratio	*****			18 to 24
C/P Ratio		61	ratio	*****			80 to 140

Respiration & Stability

Method	Units	Low	Normal	High	Normal	
CO₂ Evolution	TMECC 05.08	0.4	mg CO ₂ -C/g OM/day	**		
	TMECC 05.08	0.7	mg CO ₂ -C/g TS/day	*****		
Stability Rating	VERY STABLE					



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Cucumber Bioassay

Method	Units	Low	Normal	Normal
Emergence TMECC 05.05A	100 %	*****		80 to 100
Vigor TMECC 05.05A	107 %	*****		85 to 100
Maturity Very Mature: safe for use in containers				

Pathogens

Method	Date Tested	4/13/2020	units	Low	Normal	High	Normal
Fecal Coliforms TMECC 07.01AB	Not Tested		MPN/g				Less than 1000
Salmonella TMECC 07.02A	ND		MPN/4g	Pass	*		Less than 3

ND = None Detected Fecal Coliforms MDL 5.9 MPN/g Salmonella MDL 1 MPN/4g

EPA 503 Metals

Method	Dry Wt.	Units	Low	Normal	High	MDL	EPA Limit
Arsenic TMECC 04.12B/04.14A	3.3	mg/kg	****			0.30	41
Cadmium TMECC 04.12B/04.14A	0.09	mg/kg	****			0.08	39
Chromium TMECC 04.12B/04.14A	18.5	mg/kg				0.09	-
Cobalt TMECC 04.12B/04.14A	3.9	mg/kg	****			0.09	-
Copper TMECC 04.12B/04.14A	22.5	mg/kg	****			0.25	1500
Mercury TMECC 04.12B/04.14A	0.02	mg/kg	****			0.002	17
Molybdenum TMECC 04.12B/04.14A	4.7	mg/kg	*****			0.17	75
Nickel TMECC 04.12B/04.14A	8.8	mg/kg	****			0.12	420
Lead TMECC 04.12B/04.14A	0.9	mg/kg	****			0.23	300
Selenium TMECC 04.12B/04.14A	<MDL	mg/kg				0.97	36
Zinc TMECC 04.12B/04.14A	67	mg/kg	****			0.25	2800
Metals Assay		PASS					

Particle Size Distribution TMECC 2.02 B & C

inches	mm	% Passing	Inerts	% by wt.
3	76.2	100		
2	50	100	Total Plastic	0.00
1	25	100	Film Plastic	0.00
3/4	19.1	100	Glass	0.00
5/8	16	100	Metal	0.00
1/2	12.5	100	Sharps	0.00
3/8	9.5	86		
1/4	6.3	56	Total	0.00

Sample was received, handled and tested in accordance with TMECC procedures



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Gustavus, AK 99826
907-697-2136

DATE REC 9-Apr-20
 INVOICE # 9-Apr-20
 LAB # C20-409
 Date Reported: 04/20/20

NUTRIENT REPORT

SAMPLE I.D.: Gustavus AK 2020-04-06

	<u>%SOLIDS</u>	<u>%WATER</u>
As Received:	38.80	61.20

TOTAL ELEMENTS	-----100%DRY-----		----AS RECEIVED-----	
	%	lbs/ton	%	lbs/ton
TN	2.34	46.80	0.91	18.2
P	0.50	9.97	0.19	3.9
P205	1.15	22.9	0.44	8.9
K	0.60	12.0	0.23	4.6
K20	0.72	14.3	0.28	5.6
S	0.28	5.52	0.11	2.1
Ca	3.94	78.7	1.53	30.6
Mg	0.44	8.81	0.17	3.4
Na	0.45	9.05	0.18	3.5
C	30.20	604	11.7	234
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	mg/kg	lbs/ton	mg/kg	lbs/ton
Zn	67	0.13	26	0.05
Mn	196	0.39	76	0.15
Cu	23	0.05	9	0.02
Fe	10060	20.12	3904	7.81
B	7	0.01	2.60	0.01
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Nitrate N	314	0.63	122.0	0.24
Ammonium N	304	0.61	118	0.24
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C:N Ratio			13	
pH			7.3	
E.C.	2.63		1.02	



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INTERPRETATION GUIDE	

SAFETY INTERPRETATIONS

Pathogens

Fecal coliform bacteria are present in the gut and fecal mater of warm-blooded animals. Their presence is used as an indicator of the presence of possible human pathogens. The heat generated during proper composting is lethal to fecal coliform and other human pathogens. A test value below 1,000 per gram of compost is considered generally safe for human contact. As the compost is stored or transported, the temperature is no longer lethal for coliform bacteria and there is the possibility for regrowth or contamination by birds or other animals.

Your compost was not tested for fecal coliform.

Salmonella is a human pathogenic bacteria and a good indicator of other human pathogens. It is regularly used to monitor the likelihood of human pathogen presence in biosolids.

Your compost was tested for salmonella bacteria and found to be: VERY SAFE

Heavy Metals

9 heavy metals were identified with maximum concentration limits for land application in biosolids by USEPA in 40 CFR Part 503.B. Ongoing applications to the land are prohibited if any metal concentration exceed the limits in Table 3 of Part 503.13.

If the bars on the "Heavy Metals" for your compost are within or below the "Normal" range, your compost is safe to use as a soil amendment.

COMPOST STABILITY AND MATURITY

Respiration

Respiration is the measurement of microbially generated CO₂ from the compost when incubated at optimal temperature and moisture. It provides an indication of whether the composting process is complete and whether the compost is mature and ready for use. However, other factors may be limiting microbial activity (see C:N Ratio below)

Your Compost was rated as Very Stable: well cured, finished compost; no odors or plant toxicity

Maturity

Bioassay

Cucumbers are grown in a fixed blend of your compost and a commercial potting mix maintained at optimum moisture and temperature. Cucumbers are relatively insensitive to salinity, but very sensitive to ammonia, organic acids and herbicide residue. Emergence and Vigor are rated: results greater than 80% indicate that your compost is mature and/or contains no herbicide carryover. Very high salinity can also reduce assay results.

Your Compost Emergence % 100 Your Compost vigor % 107

Total Nitrogen, Nitrate & Ammonium

Ammonia is produced as a gas in the early stages of composting. The ammonium is nitrified to nitrate as the compost matures. Ammonia is toxic to plants at relatively low concentrations but under moist conditions is converted to ammonium which is less toxic. Nitrate is not toxic, but does contribute to overall salinity if very high. The pH of the compost typically starts out low as organic acids are released, then increases as ammonia is produced, then settles back towards neutral (7.0) as ammonium is nitrified and the compost matures.

Your Compost Ammonium level was 304 Your Compost Ammonium:Nitrate ratio was 1
Your Compost Ammonium:Total N ratio was 0.01 Your Compost pH was 7.3

Considering all the factors above, your Compost is Very Mature: safe for use in containers

FERTILITY INTERPRETATIONS

C:N Ratio

The carbon to nitrogen ratio is important to determine 1) if the composting process is complete or simply stalled out because of lack of nitrogen and 2) whether the compost, when applied to the soil, will act as a source of nitrogen for the crop or become a sink causing the crops to starve for nitrogen.

Your C:N ratio was 13 Your compost will tend to release available N for crop use.

Electrical Conductivity/Salinity

Electrical Conductivity is a convenient way to evaluate the soluble salts or salinity of a compost. High salinity is damaging to plants.

The EC of your Compost was 2.6 Medium: best to dilute 1:2 to 1:5 for most applications