CERTIFICATE OF ANALYSIS

REPORTED TO	Kelowna, City of 1435 Water Street KELOWNA, BC V1Y 1J4		
ATTENTION	Marcia Browne	**WORK ORDER**	8052599
PO NUMBER	527007	**RECEIVED / TEMP**	2018-05-28 14:22 / 22°C
PROJECT	Compost 1186-202	**REPORTED**	2018-06-12 14:51
PROJECT INFO		**COC NUMBER**	43248.53512

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at jshanko@caro.ca

Authorized By:

Jennifer Shanko, A.Sc.T.
Account Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Kelowna, City of	**WORK ORDER**	8052599
PROJECT	Compost 1186-202	**REPORTED**	2018-06-12 14:51

Analyte	Result	RL	Units	Analyzed	Qualifier
Ogogrow 5% Zeolite (8052599-01) | Matrix: Soil | Sampled: 2018-05-28					
General Parameters					
Foreign Matter	< 1	1	% dry	2018-06-04	
Organic Matter (LOI)	**81.2**	0.10	% dry	2018-06-04	
Conductivity (EC)	**2.82**	0.010	ds/m	2018-06-04	
Moisture	**46.7**	1.0	% wet	2018-06-01	
Nitrate, Water-Soluble (as N)	**1.71**	0.050	mg/kg dry	2018-05-31	
Nitrite, Water-Soluble (as N)	< 0.486	0.050	mg/kg dry	2018-05-31	
Nitrogen, Total Kjeldahl	**2.64**	0.002	% dry	2018-06-01	
pH (1:2 H2O Solution)	**6.98**	0.10	pH units	2018-06-01	PH1
Calculated Parameters					
Nitrogen, Total	**2.64**	0.0100	% dry	N/A	
Fertility / Nutrient Parameters					
Potassium, Available	**5500**	5	mg/kg dry	2018-06-08	
Carbon to Nitrogen Ratio	**11.3**	0.1	-	2018-05-31	
Ammonia, Water-Soluble (as N)	**1370**	2.0	mg/kg dry	2018-06-01	
Phosphorus, Available	**4000**	2	mg/kg dry	2018-06-08	
Strong Acid Leachable Metals					
Arsenic	**2.89**	0.30	mg/kg dry	2018-06-03	
Boron	**28.5**	2.0	mg/kg dry	2018-06-03	
Cadmium	**1.22**	0.040	mg/kg dry	2018-06-03	
Calcium	**21500**	100	mg/kg dry	2018-06-03	
Chromium	**13.6**	1.0	mg/kg dry	2018-06-03	
Cobalt	**1.73**	0.10	mg/kg dry	2018-06-03	
Copper	**199**	0.40	mg/kg dry	2018-06-03	
Lead	**8.73**	0.20	mg/kg dry	2018-06-03	
Mercury	**0.172**	0.040	mg/kg dry	2018-06-03	
Molybdenum	**2.94**	0.10	mg/kg dry	2018-06-03	
Nickel	**6.72**	0.60	mg/kg dry	2018-06-03	
Selenium	**1.78**	0.20	mg/kg dry	2018-06-03	
Zinc	**298**	2.0	mg/kg dry	2018-06-03	
Ogogrow 10% Zeolite (8052599-02) | Matrix: Soil | Sampled: 2018-05-28					
General Parameters					
Foreign Matter	< 1	1	% dry	2018-06-04	
Organic Matter (LOI)	**72.9**	0.10	% dry	2018-06-04	
Conductivity (EC)	**2.75**	0.010	ds/m	2018-06-04	
Moisture	**51.0**	1.0	% wet	2018-06-01	
Nitrate, Water-Soluble (as N)	**756**	0.050	mg/kg dry	2018-05-31	
Nitrite, Water-Soluble (as N)	< 0.495	0.050	mg/kg dry	2018-05-31	
Nitrogen, Total Kjeldahl	**3.04**	0.002	% dry	2018-06-01	

CARO ANALYTICAL SERVICES

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Analyte	Result	RL	Units	Analyzed	Qualifier
Ogogrow 10% Zeolite (8052599-02) | Matrix: Soil | Sampled: 2018-05-28, Continued					
General Parameters, Continued					
pH (1:2 H2O Solution)	**5.91**	0.10	pH units	2018-06-01	PH1
Calculated Parameters					
Nitrogen, Total	**3.04**	0.0100	% dry	N/A	
Fertility / Nutrient Parameters					
Potassium, Available	**5600**	5	mg/kg dry	2018-06-08	
Carbon to Nitrogen Ratio	**10.3**	0.1	-	2018-05-31	
Ammonia, Water-Soluble (as N)	**829**	2.0	mg/kg dry	2018-06-01	
Phosphorus, Available	**4300**	2	mg/kg dry	2018-06-08	
Strong Acid Leachable Metals					
Arsenic	**3.00**	0.30	mg/kg dry	2018-06-03	
Boron	**25.7**	2.0	mg/kg dry	2018-06-03	
Cadmium	**1.14**	0.040	mg/kg dry	2018-06-03	
Calcium	**18600**	100	mg/kg dry	2018-06-03	
Chromium	**10.9**	1.0	mg/kg dry	2018-06-03	
Cobalt	**1.82**	0.10	mg/kg dry	2018-06-03	
Copper	**192**	0.40	mg/kg dry	2018-06-03	
Lead	**8.55**	0.20	mg/kg dry	2018-06-03	
Mercury	**0.207**	0.040	mg/kg dry	2018-06-03	
Molybdenum	**2.88**	0.10	mg/kg dry	2018-06-03	
Nickel	**6.49**	0.60	mg/kg dry	2018-06-03	
Selenium	**1.55**	0.20	mg/kg dry	2018-06-03	
Zinc	**273**	2.0	mg/kg dry	2018-06-03	

Sample Qualifiers:

PH1 Due to limited sample volume or matrix, the ratio of water to soil was greater than 2:1

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Kelowna, City of	**WORK ORDER**	8052599
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Analysis Description	Method Ref.	Technique	Location
Ammonia, Water-Soluble in Soil	Carter 15.2.2 / SM 4500-NH3 G* (2011)	Fixed Ratio H2O Ext (1:5) / Automated Colorimetry (Phenate)	Kelowna
Anions in Soil	Carter 15.2.2 / SM 4110 B (2011)	Fixed Ratio H2O Ext (1:5) / Ion Chromatography	Kelowna
Available Cations in Soil	MSSMA 4.51	1N Ammonium Acetate Extraction, Atomic Spectroscopy	Sublet
Conductivity in Soil	Carter 15.2.2 / SM 2510 B (2011)	Fixed Ratio H2O Ext (1:5) / Conductivity Meter	Kelowna
Foreign Matter in Soil	TMECC 03.06	Visual Inspection	Kelowna
Moisture in Soil	ASTM D2974-87*	Gravimetry (Dried at 105C)	N/A
Nitrogen, Total Kjeldahl in Soil	SM 4500-Norg D* (2011)	Block Digestion and Flow Injection Analysis	Kelowna
Organic Matter in Soil	AASHTO T267-86	Gravimetry	Richmond
pH in Soil	Carter 16.2 / SM 4500-H+ B (2011)	1:2 Soil/Water Slurry / Electrometry	Richmond
Phosphorus, Available in Soil	UBCPLMM 6.1	Bray Extraction, Colorimetric	Sublet
SALM in Soil	BCMOE SALM V.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
% dry	Percent (dry weight basis)
% wet	Percent (as received basis)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
ds/m	Decisiemens per metre
mg/kg dry	Milligrams per kilogram (dry weight basis)
pH units	pH < 7 = acidic, ph > 7 = basic
AASHTO	American Association of State Highway and Transportation Officials, Methods of Sampling and Testing
ASTM	ASTM International Test Methods
EPA	United States Environmental Protection Agency Test Methods
MSSMA	Manual on Soil Sampling and Methods of Analysis, J.A. McKeague
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association
TMECC	Test Method for the Examination of Composting and Compost, US Composting Council
UBCPLMM	Methods Manual, Pedology Laboratory, 1977/1981, L.M. Lavkulich, UBC Department of Soil Science

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Kelowna, City of	**WORK ORDER**	8052599
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Fertility / Nutrient Parameters, Batch B8E2479										
Blank (B8E2479-BLK1)				Prepared: 2018-05-31, Analyzed: 2018-06-01						
Ammonia, Water-Soluble (as N)	< 2.0	2.0	mg/kg wet							
LCS (B8E2479-BS1)				Prepared: 2018-05-31, Analyzed: 2018-06-01						
Ammonia, Water-Soluble (as N)	< 2.0	2.0	mg/kg wet	1.00		103	85-115			
General Parameters, Batch B8E2381										
Blank (B8E2381-BLK1)				Prepared: 2018-05-30, Analyzed: 2018-05-31						
Nitrate, Water-Soluble (as N)	< 0.050	0.050	mg/kg dry							
Nitrite, Water-Soluble (as N)	< 0.050	0.050	mg/kg dry							
LCS (B8E2381-BS1)				Prepared: 2018-05-30, Analyzed: 2018-05-31						
Nitrate, Water-Soluble (as N)	3.93	0.050	mg/kg dry	4.00		98	93-110			
Nitrite, Water-Soluble (as N)	2.03	0.050	mg/kg dry	2.00		102	86-111			
General Parameters, Batch B8E2452										
Blank (B8E2452-BLK1)				Prepared: 2018-05-31, Analyzed: 2018-06-01						
Nitrogen, Total Kjeldahl	< 0.010	0.010	% wet							
Duplicate (B8E2452-DUP1)			**Source: 8052599-01**	Prepared: 2018-05-31, Analyzed: 2018-06-01						
Nitrogen, Total Kjeldahl	2.74	0.002	% dry		2.64			3	20	
Reference (B8E2452-SRM1)				Prepared: 2018-05-31, Analyzed: 2018-06-01						
Nitrogen, Total Kjeldahl	0.302	0.010	% wet	0.226		133	58.8-150			
General Parameters, Batch B8E2542										
Blank (B8E2542-BLK1)				Prepared: 2018-06-04, Analyzed: 2018-06-04						
Organic Matter (LOI)	< 0.10	0.10	% dry							
Reference (B8E2542-SRM1)				Prepared: 2018-06-04, Analyzed: 2018-06-04						
Organic Matter (LOI)	2.18	0.10	% dry	2.90		75	75-125			

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Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B8E2543										
Blank (B8E2543-BLK1)				Prepared: 2018-05-31, Analyzed: 2018-06-04						
Conductivity (EC)	< 0.010	0.010	ds/m							
LCS (B8E2543-BS1)				Prepared: 2018-05-31, Analyzed: 2018-06-04						
Conductivity (EC)	1.38	0.010	ds/m	1.41		98	95-105			
Duplicate (B8E2543-DUP1)		**Source: 8052599-01**		Prepared: 2018-05-31, Analyzed: 2018-06-04						
Conductivity (EC)	2.82	0.010	ds/m		2.82			< 1	7	
General Parameters, Batch B8F0047										
Reference (B8F0047-SRM1)				Prepared: 2018-06-01, Analyzed: 2018-06-01						
pH (1:2 H2O Solution)	7.14	0.10	pH units	7.27		98	95-105			
Reference (B8F0047-SRM2)				Prepared: 2018-06-01, Analyzed: 2018-06-01						
pH (1:2 H2O Solution)	7.28	0.10	pH units	7.27		100	95-105			
Strong Acid Leachable Metals, Batch B8E2496										
Blank (B8E2496-BLK1)				Prepared: 2018-05-31, Analyzed: 2018-06-03						
Arsenic	< 0.30	0.30	mg/kg dry							
Boron	< 2.0	2.0	mg/kg dry							
Cadmium	< 0.040	0.040	mg/kg dry							
Calcium	< 100	100	mg/kg dry							
Chromium	< 1.0	1.0	mg/kg dry							
Cobalt	< 0.10	0.10	mg/kg dry							
Copper	< 0.40	0.40	mg/kg dry							
Lead	< 0.20	0.20	mg/kg dry							
Mercury	< 0.040	0.040	mg/kg dry							
Molybdenum	< 0.10	0.10	mg/kg dry							
Nickel	< 0.60	0.60	mg/kg dry							
Selenium	< 0.20	0.20	mg/kg dry							
Zinc	< 2.0	2.0	mg/kg dry							
LCS (B8E2496-BS1)				Prepared: 2018-05-31, Analyzed: 2018-06-03						
Arsenic	1.91	0.30	mg/kg dry	2.00		95	80-120			
Boron	2.2	2.0	mg/kg dry	2.00		112	80-120			
Cadmium	2.03	0.040	mg/kg dry	2.00		101	80-120			
Calcium	199	100	mg/kg dry	200		99	80-120			
Chromium	1.8	1.0	mg/kg dry	2.00		91	80-120			
Cobalt	1.87	0.10	mg/kg dry	2.00		93	80-120			
Copper	1.82	0.40	mg/kg dry	2.00		91	80-120			
Lead	2.05	0.20	mg/kg dry	2.00		103	80-120			
Mercury	0.086	0.040	mg/kg dry	0.100		86	80-120			
Molybdenum	1.94	0.10	mg/kg dry	2.00		97	80-120			
Nickel	1.89	0.60	mg/kg dry	2.00		95	80-120			
Selenium	1.97	0.20	mg/kg dry	2.00		98	80-120			
Zinc	< 2.0	2.0	mg/kg dry	2.00		93	80-120			
Reference (B8E2496-SRM1)				Prepared: 2018-05-31, Analyzed: 2018-06-03						
Arsenic	14.6	0.30	mg/kg dry	15.1		97	70-130			
Boron	2.7	2.0	mg/kg dry	3.00		89	70-130			
Cadmium	0.230	0.040	mg/kg dry	0.216		107	70-130			
Calcium	2910	100	mg/kg dry	3290		88	70-130			
Chromium	24.1	1.0	mg/kg dry	27.5		87	70-130			
Cobalt	11.1	0.10	mg/kg dry	12.4		90	70-130			

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Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Strong Acid Leachable Metals, Batch B8E2496, Continued										
Reference (B8E2496-SRM1), Continued				Prepared: 2018-05-31, Analyzed: 2018-06-03						
Copper	39.0	0.40	mg/kg dry	45.3		86	70-130			
Lead	13.7	0.20	mg/kg dry	13.8		99	70-130			
Mercury	0.095	0.040	mg/kg dry	0.103		92	70-130			
Molybdenum	0.68	0.10	mg/kg dry	0.731		93	70-130			
Nickel	15.5	0.60	mg/kg dry	17.4		89	70-130			
Zinc	59.8	2.0	mg/kg dry	66.8		90	70-130			