Exova
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Analytical Report

Bill To:	The Black Dirt Company	Project:	
Report To:	The Black Dirt Company	ID:	
	Box 3130	Name:	
	Spruce Grove, AB, Canada	Location:	
	T7X 3A5	LSD:	
Attn:	Darren Hinkel	P.O.:	
Sampled By:		Acct code:	
Company:			

Lot ID:	**1147552**
Control Number:	C0080263
Date Received:	Jul 6, 2016
Date Reported:	Jul 27, 2016
Report Number:	2115927

		Reference Number	1147552-1	1147552-2	
		Sample Date	Jul 05, 2016	Jul 05, 2016	
		Sample Time	NA	NA	
		Sample Location			
		Sample Description	Fuhr Field Topsoil	Fuhr Field Garden Mix	
		Matrix	Soil	Soil	
Analyte		**Units**	**Results**	**Results**	Nominal Detection Limit
Physical and Aggregate Properties					
Moisture	Wet Weight @ 105°C	%	15.4	10.5	0.1
Texture			Clay Loam	Sandy Loam	
Sand	50 µm - 2 mm	% by weight	23.0	61.0	0.1
Silt	2 µm - 50 µm	% by weight	49.4	27.4	0.1
Clay	<2 µm	% by weight	27.6	11.6	0.1
Salinity					
pH	Saturated Paste	pH	5.4	6.5	
Electrical Conductivity	Saturated Paste	dS/m	0.51	7.05	0.01
SAR	Saturated Paste		0.2	1.8	
% Saturation		%	56	58	
Calcium	Saturated Paste	meq/L	3.61	54.4	0.01
Calcium	Saturated Paste	mg/kg	40.2	630	
Magnesium	Saturated Paste	meq/L	0.80	18.6	0.02
Magnesium	Saturated Paste	mg/kg	5.4	130	
Sodium	Saturated Paste	meq/L	0.26	11.0	0.04
Sodium	Saturated Paste	mg/kg	3	147	
Potassium	Saturated Paste	meq/L	0.24	16.0	0.03
Potassium	Saturated Paste	mg/kg	5	361	
Chloride	Saturated Paste	meq/L	0.16	13.1	0.06
Chloride	Saturated Paste	mg/kg	3	268	
Sulfate (SO4)	Saturated Paste	meq/L	1.02	40.4	0.06
Sulfate (SO4)	Saturated Paste	mg/kg	27.3	1120	
Sulfate-S	Saturated Paste	meq/L	1.02	40.4	0.06
Sulfate-S	Saturated Paste	mg/kg	9.1	375	
TGR	Saturated Paste	T/ac	<0.1	<0.1	
Mono-Aromatic Hydrocarbons - Soil					
Benzene	Dry Weight	mg/kg	<0.005	<0.005	0.005
Toluene	Dry Weight	mg/kg	<0.02	<0.02	0.02
Ethylbenzene	Dry Weight	mg/kg	<0.005	<0.005	0.005
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	0.03
Volatile Petroleum Hydrocarbons - Soil					
F1 C6-C10	Dry Weight	mg/kg	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil					
Extraction Date	Total Extractables		06-JUL-16	06-JUL-16	

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		Sample Description	Fuhr Field Topsoil	Fuhr Field Garden Mix	
		Matrix	Soil	Soil	
Analyte		**Units**	**Results**	**Results**	Nominal Detection Limit
Extractable Petroleum Hydrocarbons - Soil - Continued					
Silica Gel Cleanup			Done	Done	
F2c C10-C16	Dry Weight	mg/kg	<50	<50	50
F3c C16-C34	Dry Weight	mg/kg	<50	<50	50
F4c C34-C50	Dry Weight	mg/kg	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	<100	100
% C50+		%	<5	<5	
Subcontracted Analysis					
Subcontractor Report Id	Biovision		1001950	1001951	

Approved by:

Anthony Neumann, MSc
Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Methodology and Notes

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	Spruce Grove, AB, Canada	Location:	
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Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
BTEX-CCME in Soil EDM	CCME	*	Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	06-Jul-16	Exova Edmonton
BTEX-CCME in Soil EDM	US EPA	*	Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260	06-Jul-16	Exova Edmonton
Moisture	Carter	*	Gravimetric Method with Oven Drying, 51.2	07-Jul-16	Exova Edmonton
Particle Size Analysis - GS	Carter	*	Hydrometer Method, 55.3	07-Jul-16	Exova Edmonton
Saturated Paste in General Soil	Carter	*	Electrical Conductivity and Soluble Ions, Chapter 15	07-Jul-16	Exova Edmonton
Sublet to Biovision	Ext. Lab		See attached test report,	07-Jul-16	Biovision Seed Research Ltd.
TEH-CCME in Soil (Shake) EDM	CCME	*	Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	06-Jul-16	Exova Edmonton

** Reference Method Modified*

References

Carter	Soil Sampling and Methods of Analysis.
CCME	Canadian Council of Ministers of the Environment
Ext. Lab	External Laboratory
McKeague	Manual on Soil Sampling and Methods of Analysis
US EPA	US Environmental Protection Agency Test Methods

Comments:

- Clubroot and Weed Seed analysis was performed by a subcontract laboratory. See attached one page reports 1001950, 1001951 and 1001952.

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Petroleum Hydrocarbons in Soil

Batch Notes

1. The method used complies with the Reference Method for the Canada Wide Standards for Petroleum Hydrocarbons in Soil - Tier 1, April 2001, including Addendum 1, and is accredited for use in Exova.
2. Modifications of the method: See Notes and Methodology for nonconformances (if applicable).
3. Qualifications on results: See Notes and Methodology for nonconformances (if applicable).
4. Silica gel treatment is performed for fractions F2, F3, F4.
5. F1-BTEX: BTEX has been subtracted from the F1 fraction.
6. If analyzed, naphthalene has been subtracted from fraction F2 and selected PAHs have been subtracted from fraction F3.
7. F4HTGC is reported when more than 5% of the total carbon envelope elutes past C_{50}.
8. Exova does not routinely report Gravimetric Heavy Hydrocarbons (F4G or F4G-sg), F4HTGC through extended range high temperature GC is reported instead.
9. When both F4(C_{34}-C_{50}) and F4HTGC are reported, F4HTGC is the final F4 that is to be used for interpreting the CWS.
10. Quality criteria met for the batch: Data is reported in Quality Control Section of report (if requested).
    -nC_6 and nC_{10} response factors (RF) are within 30% of RF for toluene
    -nC_{10}, nC_{16} and nC_{34} RFs are within 10% of each other
    -nC_{50} RF is within 30% of the average RF for nC_{10}+nC_{16}+nC_{34}
    -linearity is within 15% for each of the calibrated carbon ranges
11. Batch data for analytical quality control are available on request.
12. Extraction and analysis holding times were met: See Notes and Methodology for nonconformances (if applicable).

Approved by:

Anthony Neumann, MSc
Laboratory Operations Manager

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BioVision seed labs
Let's Grow Together

Work Order 1001950-01

Received 7/7/2016 Completed 7/10/2016

Tested By: BioVision Seed Labs
Unit 310, 280 Portage Close
Sherwood Park, Alberta T8H 2R6
P 1 (780) 436-8822
CFIA Acc #1172

Trevor Mazutinec, B.Sc.
Lab Manager

Submitted By:
Exova (Edmonton)
7217 Roper Road
Edmonton, AB CA T6B 3J4
P (780) 438-5522
E edmonton@exova.com

Sample of: Soil
Designated: PO 203982
Sample ID: 1147552-1, Fuhr Field Topsoil

Report of Analysis

*Clubroot Pathogen (DNA)	Completed: 7/10/2016		Method	OTH

Plasmodiophora brassicae (DNA) Not Detected (LOD: 1000 Spores per gram soil)

Accredited by CFIA to conduct tests in accordance with the laboratory's scope of accreditation and the Canadian Methods and Procedures for Testing Seed.
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*Advisory test - - Method not CFIA M&P prescribed.
Method(s) used for promoting germination of dormant seed.

BioVision seed labs

Let's Grow Together

Work Order 1001950-02

Received 7/7/2016 Completed 7/8/2016

Tested By: BioVision Seed Labs
Unit 310, 280 Portage Close
Sherwood Park, Alberta T8H 2R6
P 1 (780) 436-8822
CFIA Acc #1172

SENIOR MEMBER OF
SEED COMMERCIAL ANALYSTS ASSOCIATION CANADA INC
141
JOYCE DARY

Submitted By:
Exova (Edmonton)
7217 Roper Road
Edmonton, AB CA T6B 3J4
P (780) 438-5522
E edmonton@exova.com

Sample of: Soil
Designated: PO 203982
Sample ID: 1147552-1, Fuhr Field Topsoil

Report of Analysis

*Soil Seed Analysis 50g	Completed: 7/8/2016		Method	OTH

None Found 0

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*Advisory test - - Method not CFIA M&P prescribed.
Method(s) used for promoting germination of dormant seed.

BioVision seed labs
Let's Grow Together

Work Order 1001951-01

Received 7/7/2016 Completed 7/10/2016

Tested By: BioVision Seed Labs
Unit 310, 280 Portage Close
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Trevor Mazutinec, B.Sc.
Lab Manager

Submitted By:
Exova (Edmonton)
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P (780) 438-5522
E edmonton@exova.com

Sample of: Soil
Designated: PO 203982
Sample ID: 1147552-2, Fuhr Field Garden Mix

Report of Analysis

*Clubroot Pathogen (DNA)	Completed: 7/10/2016		Method	OTH

Plasmodiophora brassicae (DNA) Not Detected (LOD: 1000 Spores per gram soil)

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Method(s) used for promoting germination of dormant seed.

BioVision seed labs

Let's Grow Together

Work Order 1001951-02

Received 7/7/2016 Completed 7/8/2016

Tested By: BioVision Seed Labs
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SEED COMMERCIAL ANALYSTS ASSOCIATION CANADA INC
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Submitted By:
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Sample of: Soil
Designated: PO 203982
Sample ID: 1147552-2, Fuhr Field Garden Mix

Report of Analysis

*Soil Seed Analysis 50g	Completed: 7/8/2016		Method	OTH

None Found 0

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Method(s) used for promoting germination of dormant seed.