



Photo 10. KM52 — Rough and loose (a) and track-packing (b).



Photo 11. KM16 — Rough and loose (a) and Track-Packing (b).



Photo 12. KM18 — Initial site preparation (a) and surface track-packing (b).



2020-21 FOLLOW-UP MONITORING — KM52 AND KM16

The KM52 and KM16 trial sites were revisited (as part of an informal walk-over in 2020 and formally re-evaluated in 2021 (using the same methods described in Section 2.2). There were no measurable changes in revegetation at either site (both at transect and vegetation quadrat scales), but a few small volunteer forbs and graminoids were found to have colonized the area (Photo 13a and Photo 14a; refer to highlighted plants). A key observation was that the surface preparations (i.e., rough-and-loose and track-packing) had been ‘washed out’ due to weathering and were no longer apparent at both trial sites (Photo 13b and Photo 14b). The surface preparations are intended to create surface heterogeneity and micro-site conditions favourable to seed establishment and germination while reducing erosion potential and enhancing surface stability. Both sites were stable and deemed to have a low erosion potential. However, due to the nature of the growth substrate and surficial geology (i.e., predominantly sand and sandy loam), surface texturing and micro-topographical variations had been ‘washed out’ progressively in 2020 and 2021 as a result of snowfall/snowmelt, rainfall, wind and weathering.

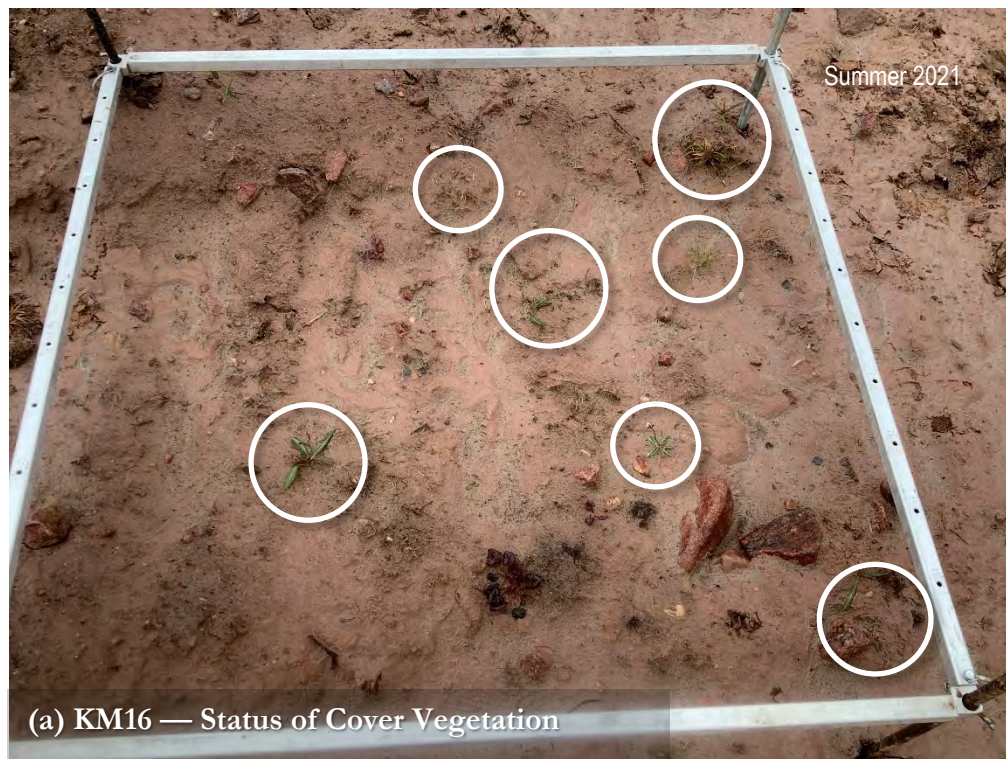


Photo 13. KM16 — Status of Cover Vegetation (a) and Surface Preparations (b).



Photo 14. KM52 — Status of Cover Vegetation (a) and Surface Preparations (b).



3.2 PRELIMINARY FINDINGS AND FUTURE DIRECTIONS

The preliminary reclamation trials described in this report are intended to be a starting point for research and development to examine revegetation strategies appropriate for and adaptable to the Project. The reclamation sites (n=3) will require periodic monitoring to determine revegetation status and growth. Since natural revegetation patterns and processes in the Arctic are characteristically slow, annual or biannual surveys are expected to be adequate to assess the long-term performance of surface configurations and to characterize rates of revegetation by early succession species. The reclamation trial's sample size is small and presently represents a short-term timeframe, and therefore imposes some design limitations. However, it does provide insight into some of the conditions, challenges and opportunities at the Project. The following approaches could benefit future directions.

Increase Reclamation Trial Sites / Increase Range of Reclamation Endpoints — Different landscapes and landscape features will likely require different and perhaps even a combination of reclamation strategies and surface configurations to provide safe, stable and desirable end-landscapes. For example, areas with more pronounced slopes or landscapes characterized by unconsolidated surface materials may require additional or site-specific preparations or mitigations. For this reason, it would be beneficial to (1) review the range of different landscape features affected by the Project, (2) examine how they can be grouped as reclamation/revegetation endpoints, and — most importantly — (3) determine what reclamation strategies and surface configurations can be applied to optimize revegetation outcomes. The study approach presented in this reclamation pilot study provides an initial template and investigative strategy to identify candidate sites, initiate reclamation trials and apply consistent survey methods to document revegetation patterns and processes onsite. The increase of reclamation trial sites to increase the range of reclamation endpoints would benefit from direct input from Baffinland's Sustainable Development and Site Environment teams.

Progressive Reclamation Trials — During appropriate phases of the Life-of-Mine cycle, it would be beneficial — i.e., as a long-term objective — to evaluate Project features that could be decommissioned and/or reclaimed to reduce the Project's disturbance footprint. For example, discontinued laydown areas, access roads or other features associated with the Mine Site, the Milne Port and/or Tote Road should be evaluated as candidate sites for reclamation studies. Where appropriate, these features could provide a ready-landscape for planning, designing and implementing medium- and even large-scale reclamation trials to examine the scalability of reclamation approaches and calibrate the time, effort and cost of reclamation onsite. This will require consultation with and input from Baffinland's Sustainable Development and Site Environment teams to identify and select suitable sites/locations that could serve to expand the reclamation/revegetation activities onsite.



4 REFERENCES

- Aiken, S.G., Dallwitz, M.J., Consaul, L.L., McJannet, C.L., Boles, R.L., Argus, G.W., Gillett, J.M., Scott, P.J., Elven, R., LeBlanc, M.C., Gillespie, L.J., Brysting, A.K., Solstad, H., and Harris, J.G. 2011. Flora of the Canadian Arctic Archipelago: descriptions, illustrations, identification, and information retrieval. (<http://nature.ca/aaflora/data>).
- B.C. Ministry of Forests and Range and B.C. Ministry of Environment. 2010. Field Manual for Describing Terrestrial Ecosystems 2nd Edition. Land Management Handbook No. 25. Crown Publications Inc., Victoria, B.C. 266 pp. (<https://www.for.gov.bc.ca/hfd/pubs/docs/lmh/lmh25-2.htm>)
- Bean, D. and Henry, G. 2003. Canadian Tundra and Taiga Experiment (CANNTEx) Field Manual Part A: Setting up a Basic Monitoring Site. 31 pp.
- Bean, D., Henry, G., and Rolph, S. 2003. Canadian Tundra and Taiga Experiment (CANNTEx) Field Manual Part B: Additional Methods and Experimental Manipulations. 59 pp.
- EDI Environmental Dynamics Inc. 2019. Research review — advances in Arctic reclamation: implications for reclamation practices & trials at the Mary River Mine project. Prepared for Baffinland Iron Mine Corporation, Whitehorse, Yukon. 23 pp.
- EDI Environmental Dynamics Inc. 2020. Reclamation Pilot Study — Mary River Mine Project: Revegetation Survey & Preliminary Reclamation Trial.
- Mallory, C.L. and Aiken, S. 2012. Common plants of Nunavut. Inhabit Media Inc., Iqaluit, Nunavut. 205 pp.
- Neville, M. 2003. Best Management Practices for Pipeline Construction in Native Prairie Environments. Prepared for Alberta Environment and Alberta Sustainable Resource Development (superseded by the Alberta Energy Regulator). 133 pp.
- Polster, D. 2013. Making Sites Rough and Loose: A Soil Adjustment Technique. Technical Note. Prepared for the Boreal Research Institute, Northern Alberta Institute of Technology. 3 pp.
- Soil Classification Working Group. 1998. Canadian System of Soil Classification, Third Edition. National Research Press, Ottawa, Ontario. 187 pp. (http://sis.agr.gc.ca/cansis/publications/manuals/1998-cssc-ed3/cssc3_manual.pdf)
- Stewart, K. and Conway, A. 2020. Meliadine Gold Mine 2020 Annual Report Appendix 32 : 2020 Tundra Restoration and Natural Recovery Monitoring Report. Tundra restoration and natural recovery monitoring at Agnico Eagle Mines Meliadine site, Nunavut. NIRB File No. 11MN034-2020, NIRB Registry No. 334386. 34 pp.



APPENDICES



APPENDIX A DATA COLLECTION SHEETS

GROUND INSPECTION FORM

G ☐ VS V ☐		PHOTO		X:	Y:	DATE	
PROJECT ID.				SURV.			
MAP SHEET				PLOT #		POLY. #	
UTM ZONE		LAT. / NORTH			LONG. / EAST		
ASPECT °					ELEVATION m		
SLOPE %		SMR		SNR			
MESO SLOPE POSITION	☐ Crest ☐ Upper slope	☐ Mid slope ☐ Lower slope ☐ Toe	☐ Depression ☐ Level				
DRAINAGE - MINERAL SOILS	☐ Very rapidly ☐ Rapidly	☐ Well ☐ Mod. well ☐ Imperfectly	☐ Poorly ☐ Very poorly				
MOISTURE SUBCLASSES - ORGANIC SOILS	☐ Aqueous ☐ Peraquic	☐ Aquic ☐ Subaquic	☐ Perhumid ☐ Humid				
MINERAL SOIL TEXTURE	☐ Sandy (LS,S) ☐ Loamy (SL,L,SCL,FSL)		☐ Silty (SiL,Si) ☐ Clayey (SiCL,CL,SC,SiC,C)				
ORGANIC SOIL TEXTURE ☐ Fibric ☐ Mesic ☐ Humic			SURF. ORGANIC HORIZON THICKNESS ☐ 0-40 cm ☐ > 40 cm				
HUMUS FORM ☐ Mor ☐ Moder ☐ Mull			ROOT RESTRICTING LAYER Depth _____ cm Type _____				
COARSE FRAGMENT CONTENT ☐ < 20% ☐ 20-35% ☐ 35-70% ☐ > 70%							
TERRAIN		COMPONENT: TC1 ☐ TC2 ☐ TC3 ☐					
TERRAIN TEXTURE		SURFICIAL MATERIAL		SURFACE EXPRESSION		GEOMORPH PROCESS	
1		1		1		1	
2		2		2		2	
ECOSYSTEM		COMPONENT: EC1 ☐ EC2 ☐ EC3 ☐					
BGC UNIT				ECOSECTION			
SITE SERIES				SITE MODIFIERS			
STRUCTURAL STAGE				CROWN CLOSURE %			
ECOSYSTEM POLYGON SUMMARY				TERRAIN POLYGON SUMMARY			
	%	SS	SM	ST		%	Classification
EC1					TC1		
EC2					TC2		
EC3					TC3		

DOMINANT / INDICATOR PLANT SPECIES

[illegible]

COMPLETE 

PARTIAL ☐

Tree Mensuration

[illegible]

NOTES (site diagram, exposure, gleying, etc.)

Date	Time	Location	Weather	Wind	Temp	Humidity	Pressure	Remarks

ECOSYSTEM FIELD FORM

MINISTRY OF FORESTS
BC ENVIRONMENT

PROJECT
ID.

DATE	Y	M	D

PLOT NO.

FIELD NO.

SURVEYOR(S)

SITE DESCRIPTION	LOCATION						SITE DIAGRAM							
	GENERAL LOCATION													
	FOREST REGION		MAPSHEET		UTM ZONE						LAT./ NORTH.		LONG./ EAST.	
	AIRPHOTO NO.			X CO-ORD.		Y CO-ORD.					MAP UNIT			
	SITE INFORMATION													
	PLOT REPRESENTING													
	BGC UNIT		SITE SERIES			TRANS./ DISTRIB.		ECOSECTION						
	MOISTURE REGIME		NUTRIENT REGIME		SUCCESS. STATUS		STRUCT. STAGE		REALM/ CLASS					
	ELEV. m.		SLOPE %		ASPECT °		MESO SLOPE POS.		SURFACE TOPOG.					
	NOTES						SUBSTRATE (%)							
						ORG. MATTER				ROCKS				
						DEC. WOOD				MINERAL SOIL				
						BEDROCK				WATER				

FS882 (1) HRE 98/5

FS882 (3) HRE 98/5

[illegible]

FS882 (2) HRE 98/5F-S 882 (4) HRF 98/5

Vegetation Abundance Monitoring Program 2018										Point-Quadrat Data																																																																																																													
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Site ID:																				Thick:																																																																																																			
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		Non-Exclosure																				Thin:																																																																																																	
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Notes:																																																																																																																							

Vegetation Abundance Monitoring Program 2018

Point-Quadrat Data



Page: of

65 cm CANOPY		75 cm CANOPY		85 cm CANOPY		95 cm CANOPY	
A65:		A75:		A85:		A95:	
B65:		B75:		B85:		B95:	
C65:		C75:		C85:		C95:	
D65:		D75:		D85:		D95:	
E65:		E75:		E85:		E95:	
F65:		F75:		F85:		F95:	
G65:		G75:		G85:		G95:	
H65:		H75:		H85:		H95:	
I65:		I75:		I85:		I95:	
J65:		J75:		J85:		J95:	
65 cm GROUND		75 cm GROUND		85 cm GROUND		95 cm GROUND	
A65:		A75:		A85:		A95:	
B65:		B75:		B85:		B95:	
C65:		C75:		C85:		C95:	
D65:		D75:		D85:		D95:	
E65:		E75:		E85:		E95:	
F65:		F75:		F85:		F95:	
G65:		G75:		G85:		G95:	
H65:		H75:		H85:		H95:	
I65:		I75:		I85:		I95:	
J65:		J75:		J85:		J95:	



APPENDIX B SUPPORTING INFORMATION



1. KM52 | 2019 SURVEY



Appendix B-1: Table 1. KM52 — Vegetation Survey — Georeferencing (NAD1983 UTM Zone 17N).

Survey Area	Survey Location	Identifier/Activity	Northing	Easting
Disturbed	KM52-0	Survey Marker	7936125.03	525984.6437
		Soil Pit	7936124.492	525986.242
		Vegetation Quadrat	7936128.389	525985.664
	KM52-50	Survey Marker	7936174.073	525981.6067
		Soil Pit	7936175.986	525982.9982
		Vegetation Quadrat	7936172.624	525981.6597
	KM52-100	Survey Marker	7936223.046	525972.8407
		Soil Pit	7936220.833	525974.2824
		Vegetation Quadrat	7936222.379	525973.0256
Control	KM52-C0	Survey Marker	7936118.877	525955.6433
		Soil Pit	7936123.059	525960.12
		Vegetation Quadrat	7936124.695	525957.0582
	KM52-C50	Survey Marker	7936168.669	525949.9803
		Soil Pit	7936173.391	525953.0002
		Vegetation Quadrat	7936165.329	525950.5161
	KM52-C100	Survey Marker	7936220.338	525942.7386
		Soil Pit	7936217.381	525947.2311
		Vegetation Quadrat	7936214.865	525942.133

Appendix B-1: Table 2. KM52 — Reclamation Trial — Georeferencing (NAD1983 UTM Zone 17N).

7936125.699N
525984.6356E

7936174.904N
525985.6995E

7936222.712N
525972.8447E

South

Rough & Loose

Rough & Loose +
Track Packing

North

7936124.011N
525992.5439E

Tote Road

7936224.378N
525981.4547E



Baffinland Iron Mine's Corporation
(Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 29-JUL-19
Report Date: 08-AUG-19 13:50 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2318743
Project P.O. #: 4500057496
Job Reference: 19Y0005:08
C of C Numbers: 17-706508
Legal Site Desc:

Maria De Leon
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-7 KM52-0 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Physical Tests								
% Saturation		18.2		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		0.82		0.10	%	07-AUG-19	08-AUG-19	R4743748
pH (1:2 soil:water)		8.83		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		7.96		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		56.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		37.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Clay		7.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		2.1		1.0	mg/kg	01-AUG-19	01-AUG-19	R4738808
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Potassium		30		20	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4740489
Saturated Paste Extractables								
SAR		0.53		0.10	SAR		07-AUG-19	
Calcium (Ca)		80.6		5.0	mg/L		06-AUG-19	R4739873
Calcium (Ca)		14.6		0.91	mg/kg		07-AUG-19	
Chloride (Cl)		141		5.0	mg/L	06-AUG-19	06-AUG-19	R4739939
Chloride (Cl)		25.6		0.91	mg/kg		07-AUG-19	
Conductivity Sat. Paste		0.701		0.040	dS/m	06-AUG-19	06-AUG-19	R4739817
Magnesium (Mg)		26.0		5.0	mg/L		06-AUG-19	R4739873
Magnesium (Mg)		4.73		0.91	mg/kg		07-AUG-19	
Potassium (K)		6.5		5.0	mg/L		06-AUG-19	R4739873
Potassium (K)		1.18		0.91	mg/kg		07-AUG-19	
Sodium (Na)		21.4		5.0	mg/L		06-AUG-19	R4739873
Sodium (Na)		3.90		0.91	mg/kg		07-AUG-19	
Sulfate (SO4)		6.4		1.1	mg/kg		07-AUG-19	
Sulfate (SO4)		35.2		6.0	mg/L	06-AUG-19	06-AUG-19	R4739939
TGR(sodic)		<0.10		0.10	t/ha		07-AUG-19	
TGR(brine)		<0.10		0.10	t/ha		07-AUG-19	
L2318743-8 KM52-50 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Physical Tests								
% Saturation		25.5		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		2.45		0.10	%	06-AUG-19	07-AUG-19	R4742549
pH (1:2 soil:water)		8.56		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		7.77		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		74.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		20.0		1.0	%	02-AUG-19	06-AUG-19	R4740289

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-8 KM52-50 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Particle Size								
% Clay		6.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		2.2		1.0	mg/kg	01-AUG-19	01-AUG-19	R4738808
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4740509
Available Potassium		37		20	mg/kg	02-AUG-19	02-AUG-19	R4740509
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4740489
Saturated Paste Extractables								
SAR		0.25		0.10	SAR		07-AUG-19	
Calcium (Ca)		62.3		5.0	mg/L		06-AUG-19	R4739873
Calcium (Ca)		15.9		1.3	mg/kg		07-AUG-19	
Chloride (Cl)		42.3		5.0	mg/L	06-AUG-19	06-AUG-19	R4739939
Chloride (Cl)		10.8		1.3	mg/kg		07-AUG-19	
Conductivity Sat. Paste		0.414		0.040	dS/m	06-AUG-19	06-AUG-19	R4739817
Magnesium (Mg)		12.8		5.0	mg/L		06-AUG-19	R4739873
Magnesium (Mg)		3.3		1.3	mg/kg		07-AUG-19	
Potassium (K)		9.0		5.0	mg/L		06-AUG-19	R4739873
Potassium (K)		2.3		1.3	mg/kg		07-AUG-19	
Sodium (Na)		8.4		5.0	mg/L		06-AUG-19	R4739873
Sodium (Na)		2.2		1.3	mg/kg		07-AUG-19	
Sulfate (SO4)		3.7		1.5	mg/kg		07-AUG-19	
Sulfate (SO4)		14.6		6.0	mg/L	06-AUG-19	06-AUG-19	R4739939
TGR(sodic)		<0.10		0.10	t/ha		07-AUG-19	
TGR(brine)		<0.10		0.10	t/ha		07-AUG-19	
L2318743-9 KM52-100 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Physical Tests								
% Saturation		17.8		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		0.59		0.10	%	06-AUG-19	07-AUG-19	R4742549
pH (1:2 soil:water)		8.84		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		8.03		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		84.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		11.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Clay		5.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		1.2		1.0	mg/kg	02-AUG-19	02-AUG-19	R4739959
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4740509
Available Potassium		33		20	mg/kg	02-AUG-19	02-AUG-19	R4740509
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4739093

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-9 KM52-100 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Plant Available Nutrients								
Saturated Paste Extractables								
SAR		0.30		0.10	SAR		07-AUG-19	
Calcium (Ca)		55.2		5.0	mg/L		06-AUG-19	R4739873
Calcium (Ca)		9.84		0.89	mg/kg		07-AUG-19	
Chloride (Cl)		30.6		5.0	mg/L	06-AUG-19	06-AUG-19	R4739939
Chloride (Cl)		5.46		0.89	mg/kg		07-AUG-19	
Conductivity Sat. Paste		0.373		0.040	dS/m	06-AUG-19	06-AUG-19	R4739817
Magnesium (Mg)		9.0		5.0	mg/L		06-AUG-19	R4739873
Magnesium (Mg)		1.61		0.89	mg/kg		07-AUG-19	
Potassium (K)		11.4		5.0	mg/L		06-AUG-19	R4739873
Potassium (K)		2.03		0.89	mg/kg		07-AUG-19	
Sodium (Na)		9.1		5.0	mg/L		06-AUG-19	R4739873
Sodium (Na)		1.63		0.89	mg/kg		07-AUG-19	
Sulfate (SO4)		2.4		1.1	mg/kg		07-AUG-19	
Sulfate (SO4)		13.7		6.0	mg/L	06-AUG-19	06-AUG-19	R4739939
TGR(sodic)		<0.10		0.10	t/ha		07-AUG-19	
TGR(brine)		<0.10		0.10	t/ha		07-AUG-19	
L2318743-10 KM52-C0 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Physical Tests								
% Saturation		16.9		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		0.49		0.10	%	06-AUG-19	07-AUG-19	R4742549
pH (1:2 soil:water)		8.85		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		8.11		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		53.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		39.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Clay		8.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	02-AUG-19	02-AUG-19	R4739959
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4740509
Available Potassium		21		20	mg/kg	02-AUG-19	02-AUG-19	R4740509
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4739093
Saturated Paste Extractables								
SAR		0.17		0.10	SAR		07-AUG-19	
Calcium (Ca)		88.8		5.0	mg/L		02-AUG-19	R4738634
Calcium (Ca)		15.0		0.85	mg/kg		07-AUG-19	
Chloride (Cl)		199		5.0	mg/L	02-AUG-19	02-AUG-19	R4738667
Chloride (Cl)		33.7		0.85	mg/kg		07-AUG-19	
Conductivity Sat. Paste		0.995		0.040	dS/m	02-AUG-19	02-AUG-19	R4737628

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-10 KM52-C0 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL Saturated Paste Extractables Magnesium (Mg) Magnesium (Mg) Potassium (K) Potassium (K) Sodium (Na) Sodium (Na) Sulfate (SO4) Sulfate (SO4) TGR(sodic) TGR(brine)								
		44.3		5.0	mg/L		02-AUG-19	R4738634
		7.49		0.85	mg/kg		07-AUG-19	
		8.0		5.0	mg/L		02-AUG-19	R4738634
		1.36		0.85	mg/kg		07-AUG-19	
		7.9		5.0	mg/L		02-AUG-19	R4738634
		1.34		0.85	mg/kg		07-AUG-19	
		5.4		1.0	mg/kg		07-AUG-19	
		32.0		6.0	mg/L	02-AUG-19	02-AUG-19	R4738667
		<0.10		0.10	t/ha		07-AUG-19	
		<0.10		0.10	t/ha		07-AUG-19	
L2318743-11 KM52-C50 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL Physical Tests % Saturation Organic Matter (LOI) pH (1:2 soil:water) pH (1:2 CaCl2) Particle Size % Sand % Silt % Clay Texture Plant Available Nutrients Available Nitrate-N Available Phosphate-P Available Potassium Available Sulfate-S Saturated Paste Extractables SAR Calcium (Ca) Calcium (Ca) Chloride (Cl) Chloride (Cl) Conductivity Sat. Paste Magnesium (Mg) Magnesium (Mg) Potassium (K) Potassium (K) Sodium (Na) Sodium (Na) Sulfate (SO4)								
		15.6		1.0	%	02-AUG-19	02-AUG-19	R4738712
		0.28		0.10	%	06-AUG-19	07-AUG-19	R4742549
		9.04		0.10	pH	06-AUG-19	06-AUG-19	R4739814
		8.24		0.10	pH	02-AUG-19	02-AUG-19	R4739805
		56.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
		38.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
		6.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
		<1.0		1.0	mg/kg	02-AUG-19	02-AUG-19	R4739959
		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4740509
		<20		20	mg/kg	02-AUG-19	02-AUG-19	R4740509
		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4739093
		0.15		0.10	SAR		07-AUG-19	
		94.1		5.0	mg/L		02-AUG-19	R4738634
		14.7		0.78	mg/kg		07-AUG-19	
		242		5.0	mg/L	02-AUG-19	02-AUG-19	R4738667
		37.9		0.78	mg/kg		07-AUG-19	
		0.988		0.040	dS/m	02-AUG-19	02-AUG-19	R4737628
		43.6		5.0	mg/L		02-AUG-19	R4738634
		6.83		0.78	mg/kg		07-AUG-19	
		5.6		5.0	mg/L		02-AUG-19	R4738634
		0.88		0.78	mg/kg		07-AUG-19	
		6.9		5.0	mg/L		02-AUG-19	R4738634
		1.07		0.78	mg/kg		07-AUG-19	
		2.67		0.94	mg/kg		07-AUG-19	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)	MS-B	L2318743-1, -10, -11, -12, -2, -3, -4, -6
Matrix Spike	Magnesium (Mg)	MS-B	L2318743-1, -10, -11, -12, -2, -3, -4, -6
Matrix Spike	Sodium (Na)	MS-B	L2318743-1, -10, -11, -12, -2, -3, -4, -6

Sample Parameter Qualifier key listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
SAR:DL	SAR is incalculable due to undetectable Na. Detection Limit represents maximum possible SAR value.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-PASTE-IC-GP	Soil	Chloride in Soil (Paste) by IC A soil extract produced by the saturated paste extraction procedure is analyzed for Chloride by IC (Ion Chromatography)..	Carter-CSSS/EPA 300.1 Modified
EC-PASTE-GP	Soil	Conductivity (Saturated Paste) Electrical conductivity of sample extracts is measured using a conductivity meter, which essentially consists of a conductance cell and a Wheatstone bridge.	CSSS 15.3.1 2ND ED.
MET-PASTE-ICP-GP	Soil	Salinity Metals By ICPOES (Sat. Paste) A soil extract produced by the saturated paste extraction procedure is analyzed for Calcium, Magnesium, Potassium, Sodium by ICPOES.	CSSS CH15/EPA 6010B
NO3-AVAIL-SK	Soil	Available Nitrate-N Available Nitrate and Nitrite are extracted from the soil using a dilute calcium chloride solution. Nitrate is quantitatively reduced to nitrite by passage of the sample through a copperized cadmium column. The nitrite (reduced nitrate plus original nitrite) is then determined by diazotizing with sulfanilamide followed by coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. The resulting water soluble dye has a magenta color which is measured at colorimetrically at 520nm.	Alberta Ag (1988)
ORGANIC MATTER-GP	Soil	Organic Matter (LOI) Weight loss between 105 C and 550 C is approximately equal to the amount of organic matter in a sample.	AAFC 1984 84-045
PH-1:2 CaCl2-GP	Soil	pH (1:2 CaCl2) pH 1:2 Soil: 1:2 CaCl2 Extract; The pH is determined in the laboratory using a pH electrode. Field Measurement is recommended where accurate pH measurements are required, due to the 15 minute recommended hold time.	CSSS 16.3 - 1:2 Extraction w/0.01M CaCl2
PH-1:2-GP	Soil	pH in Soil (1:2 Soil:Water) pH 1:2 Soil: Water Extract; The pH is determined in the laboratory using a pH electrode. Field Measurement is recommended where accurate pH measurements are required, due to the 15 minute recommended hold time.	CSSS 16.2 - pH of 1:2 water extract
PO4/K-AVAIL-SK	Soil	Plant Available Phosphorus and Potassium Plant available phosphorus and potassium are extracted from the soil using Modified Kelowna solution. Phosphorous in the soil extract is determined colorimetrically at 880 nm, while potassium is determined by flame emission at 770 nm.	Comm. Soil Sci. Plant Anal, 25 (5&6)
PSA-1-GP	Soil	Particle Size by Hydrometer Soil samples oven dried, grinded, and soaked in Calgon solution for 16 hours; soil suspensions measured for their particle size by distribution using a hydrometer after various times of settling.	CSSS 55.3 - Hydrometer (modified)
SAL-MG/KG-CALC-GP	Soil	Detailed Salinity Calculation (mg/kg)	CALCULATION
SALINITY-INTCHECK-GP	Soil		CALCULATION
SAR-PASTE-CALC-GP	Soil	Sodium Adsorption Ratio (Sat. Paste) A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES. Sodium Adsorption Ratio (SAR) is calculated as per "Soil Sampling and Methods of Analysis" by M. Carter.	CSSS 15.4.4-Calculation
SAT-PCNT-GP	Soil	% Saturation As received samples are pasted to saturation. A sub-sample is weighed, oven dried and re-weighed to determine % saturation.	AER D50
SO4-AVAIL-SK	Soil	Available Sulfate-S Plant available sulfate in the soil is extracted using a weak calcium chloride solution. Sulfate in the extract is determined by ICP-OES. This extraction may also produce organic sulfur in the extracts when organic soils are analyzed.	REC METH SOIL ANAL - AB. AG(1988)
SO4-PASTE-IC-GP	Soil	Sulfate by IC (Saturated Paste) A soil extract produced by the saturated paste extraction procedure is analyzed by Ion Chromatography with conductivity or UV detection.	CSSS CH15/EPA 300.1
TGR2-CALC-GP	Soil	Theoretical Gypsum Requirement	J. Ashworth et al (1999)

Theoretical Gypsum Requirement is an estimate of the gypsum amendment required to remediate brine-contaminated or sodic soils, and is provided in units of tonnes per hectare (t/ha) for a treatment depth of 15cm. TGR(brine), intended for brine-contaminated soils, is calculated using Method A from "A Comparison of Methods for Gypsum Requirement of Brine-Contaminated Soils", by J. Ashworth (Cdn J. of Soil Science, 1999), available at www.alsglobal.com. TGR(sodic), intended for naturally sodic soils, uses the Oster and Frenkel method (Method B) from the same paper. Reported TGR values are capped at 50 t/ha, considered the maximum practical gypsum amendment. To convert TGR from t/ha to tons/acre, multiply by 0.446. To determine a TGR value for an alternate treatment depth, multiply by [desired treatment depth (cm) / 15 cm].

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
GP	ALS ENVIRONMENTAL - GRANDE PRAIRIE, ALBERTA, CANADA

Chain of Custody Numbers:

17-706508

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample
- mg/kg ww - milligrams per kilogram based on wet weight of sample
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample
- mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



2. KM16 | 2019 SURVEY



Appendix B-2: Table 1. KM16 — Georeferencing (NAD1983 UTM Zone 17N).

Survey Area	Survey Location	Identifier/Activity	Northing	Easting
Disturbed	KM16-0	Survey Marker	7966511.786	512842.5098
		Soil Pit	7966515.018	512841.9323
		Vegetation Quadrat	7966518.521	512831.1031
	KM16-75	Survey Marker	7966541.702	512773.019
		Soil Pit	7966543.502	512775.4485
		Vegetation Quadrat	7966545.804	512768.8105
	KM16-150	Survey Marker	7966572.859	512705.3704
		Soil Pit	7966574.11	512709.4418
		Vegetation Quadrat	7966571.42	512707.1571
Control	KM16-C0	Survey Marker	7966487.054	512829.1336
		Soil Pit	7966491.622	512828.3038
		Vegetation Quadrat	7966487.935	512827.2455
	KM16-C75	Survey Marker	7966514.965	512760.0727
		Soil Pit	7966517.305	512759.675
		Vegetation Quadrat	7966518.74	512757.1561
	KM16-C150	Survey Marker	7966545.787	512692.3557
		Soil Pit	7966552.833	512695.4509
		Vegetation Quadrat	7966550.487	512694.8375

Appendix B-2: Table 2. KM16 —Reclamation Trial — Georeferencing (NAD1983 UTM Zone 17N).

7966513.451N 512841.14E	7966543.84N 512776.0391E	7966573.199N 512706.2748E		
Southeast	<table><tr><td>Rough & Loose</td><td>Rough & Loose + Track Packing</td></tr></table>	Rough & Loose	Rough & Loose + Track Packing	Northwest
Rough & Loose	Rough & Loose + Track Packing			
7966523.175N 512844.288E	Tote Road	7966579.021N 512709.8653E		



Baffinland Iron Mine's Corporation
(Oakville)
ATTN: William Bowden/Connor Devereaux
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 29-JUL-19
Report Date: 08-AUG-19 13:50 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2318743
Project P.O. #: 4500057496
Job Reference: 19Y0005:08
C of C Numbers: 17-706508
Legal Site Desc:

Maria De Leon
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-1 KM16-0 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Physical Tests								
% Saturation		46.3		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		4.29		0.10	%	06-AUG-19	07-AUG-19	R4742549
pH (1:2 soil:water)		7.45		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		6.83		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		88.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		8.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Clay		4.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		LOAMY SAND				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		1.6		1.0	mg/kg	01-AUG-19	01-AUG-19	R4738808
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Potassium		26		20	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4740489
Saturated Paste Extractables								
SAR		0.25		0.10	SAR		07-AUG-19	
Calcium (Ca)		165		5.0	mg/L		02-AUG-19	R4738634
Calcium (Ca)		76.4		2.3	mg/kg		07-AUG-19	
Chloride (Cl)		471	DLA	10	mg/L	02-AUG-19	02-AUG-19	R4738667
Chloride (Cl)		218	DLA	4.6	mg/kg		07-AUG-19	
Conductivity Sat. Paste		1.60		0.040	dS/m	02-AUG-19	02-AUG-19	R4737628
Magnesium (Mg)		57.5		5.0	mg/L		02-AUG-19	R4738634
Magnesium (Mg)		26.6		2.3	mg/kg		07-AUG-19	
Potassium (K)		11.2		5.0	mg/L		02-AUG-19	R4738634
Potassium (K)		5.2		2.3	mg/kg		07-AUG-19	
Sodium (Na)		14.5		5.0	mg/L		02-AUG-19	R4738634
Sodium (Na)		6.7		2.3	mg/kg		07-AUG-19	
Sulfate (SO4)		<5.6	DLA	5.6	mg/kg		07-AUG-19	
Sulfate (SO4)		<12	DLA	12	mg/L	02-AUG-19	02-AUG-19	R4738667
TGR(sodic)		<0.10		0.10	t/ha		07-AUG-19	
TGR(brine)		<0.10		0.10	t/ha		07-AUG-19	
L2318743-2 KM16-75 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Physical Tests								
% Saturation		29.0		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		2.03		0.10	%	06-AUG-19	07-AUG-19	R4742549
pH (1:2 soil:water)		7.34		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		6.71		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		89.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		6.0		1.0	%	02-AUG-19	06-AUG-19	R4740289

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-2 KM16-75 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Particle Size								
% Clay		5.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		1.0		1.0	mg/kg	01-AUG-19	01-AUG-19	R4738808
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Potassium		22		20	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4740489
Saturated Paste Extractables								
SAR		0.17		0.10	SAR		07-AUG-19	
Calcium (Ca)		79.8		5.0	mg/L		02-AUG-19	R4738634
Calcium (Ca)		23.2		1.5	mg/kg		07-AUG-19	
Chloride (Cl)		180		5.0	mg/L	02-AUG-19	02-AUG-19	R4738667
Chloride (Cl)		52.2		1.5	mg/kg		07-AUG-19	
Conductivity Sat. Paste		0.831		0.040	dS/m	02-AUG-19	02-AUG-19	R4737628
Magnesium (Mg)		23.1		5.0	mg/L		02-AUG-19	R4738634
Magnesium (Mg)		6.7		1.5	mg/kg		07-AUG-19	
Potassium (K)		7.2		5.0	mg/L		02-AUG-19	R4738634
Potassium (K)		2.1		1.5	mg/kg		07-AUG-19	
Sodium (Na)		6.5		5.0	mg/L		02-AUG-19	R4738634
Sodium (Na)		1.9		1.5	mg/kg		07-AUG-19	
Sulfate (SO4)		<1.7		1.7	mg/kg		07-AUG-19	
Sulfate (SO4)		<6.0		6.0	mg/L	02-AUG-19	02-AUG-19	R4738667
TGR(sodic)		<0.10		0.10	t/ha		07-AUG-19	
TGR(brine)		<0.10		0.10	t/ha		07-AUG-19	
L2318743-3 KM16-150 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Physical Tests								
% Saturation		40.6		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		5.48		0.10	%	06-AUG-19	07-AUG-19	R4742549
pH (1:2 soil:water)		6.78		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		6.37		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		88.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		7.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Clay		5.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		1.7		1.0	mg/kg	01-AUG-19	01-AUG-19	R4738808
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Potassium		27		20	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4740489

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-3 KM16-150 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Plant Available Nutrients								
Saturated Paste Extractables								
SAR		0.23		0.10	SAR		07-AUG-19	
Calcium (Ca)		100		5.0	mg/L		02-AUG-19	R4738634
Calcium (Ca)		40.6		2.0	mg/kg		07-AUG-19	
Chloride (Cl)		269		5.0	mg/L	02-AUG-19	02-AUG-19	R4738667
Chloride (Cl)		109		2.0	mg/kg		07-AUG-19	
Conductivity Sat. Paste		1.00		0.040	dS/m	02-AUG-19	02-AUG-19	R4737628
Magnesium (Mg)		31.9		5.0	mg/L		02-AUG-19	R4738634
Magnesium (Mg)		13.0		2.0	mg/kg		07-AUG-19	
Potassium (K)		9.8		5.0	mg/L		02-AUG-19	R4738634
Potassium (K)		4.0		2.0	mg/kg		07-AUG-19	
Sodium (Na)		10.4		5.0	mg/L		02-AUG-19	R4738634
Sodium (Na)		4.2		2.0	mg/kg		07-AUG-19	
Sulfate (SO4)		<2.4		2.4	mg/kg		07-AUG-19	
Sulfate (SO4)		<6.0		6.0	mg/L	02-AUG-19	02-AUG-19	R4738667
TGR(sodic)		<0.10		0.10	t/ha		07-AUG-19	
TGR(brine)		<0.10		0.10	t/ha		07-AUG-19	
L2318743-4 KM16-C0 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL								
Physical Tests								
% Saturation		30.7		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		2.75		0.10	%	06-AUG-19	07-AUG-19	R4742549
pH (1:2 soil:water)		7.89		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		7.08		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		89.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		6.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Clay		5.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	01-AUG-19	01-AUG-19	R4738808
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Potassium		21		20	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4740489
Saturated Paste Extractables								
SAR		0.26		0.10	SAR		07-AUG-19	
Calcium (Ca)		55.0		5.0	mg/L		02-AUG-19	R4738634
Calcium (Ca)		16.9		1.5	mg/kg		07-AUG-19	
Chloride (Cl)		32.8		5.0	mg/L	02-AUG-19	02-AUG-19	R4738667
Chloride (Cl)		10.1		1.5	mg/kg		07-AUG-19	
Conductivity Sat. Paste		0.508		0.040	dS/m	02-AUG-19	02-AUG-19	R4737628

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-4 KM16-C0 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL Saturated Paste Extractables Magnesium (Mg) Magnesium (Mg) Potassium (K) Potassium (K) Sodium (Na) Sodium (Na) Sulfate (SO4) Sulfate (SO4) TGR(sodic) TGR(brine)								
		22.3		5.0	mg/L		02-AUG-19	R4738634
		6.8		1.5	mg/kg		07-AUG-19	
		6.9		5.0	mg/L		02-AUG-19	R4738634
		2.1		1.5	mg/kg		07-AUG-19	
		9.0		5.0	mg/L		02-AUG-19	R4738634
		2.7		1.5	mg/kg		07-AUG-19	
		<1.8		1.8	mg/kg		07-AUG-19	
		<6.0		6.0	mg/L	02-AUG-19	02-AUG-19	R4738667
		<0.10		0.10	t/ha		07-AUG-19	
		<0.10		0.10	t/ha		07-AUG-19	
L2318743-5 KM16-C75 Sampled By: CLIENT on 24-JUL-19 Matrix: SOIL Physical Tests % Saturation Organic Matter (LOI) pH (1:2 soil:water) pH (1:2 CaCl2) Particle Size % Sand % Silt % Clay Texture Plant Available Nutrients Available Nitrate-N Available Phosphate-P Available Potassium Available Sulfate-S Saturated Paste Extractables SAR Calcium (Ca) Calcium (Ca) Chloride (Cl) Chloride (Cl) Conductivity Sat. Paste Magnesium (Mg) Magnesium (Mg) Potassium (K) Potassium (K) Sodium (Na) Sodium (Na) Sulfate (SO4)								
		45.6		1.0	%	02-AUG-19	02-AUG-19	R4738712
		5.36		0.10	%	06-AUG-19	07-AUG-19	R4742549
		7.52		0.10	pH	06-AUG-19	06-AUG-19	R4739814
		6.54		0.10	pH	02-AUG-19	02-AUG-19	R4739805
		87.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
		7.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
		6.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
		<1.0		1.0	mg/kg	01-AUG-19	01-AUG-19	R4738808
		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4739152
		27		20	mg/kg	02-AUG-19	02-AUG-19	R4739152
		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4740489
		<0.20	SAR:DL	0.20	SAR		07-AUG-19	
		29.7		5.0	mg/L		06-AUG-19	R4739873
		13.5		2.3	mg/kg		07-AUG-19	
		36.1		5.0	mg/L	06-AUG-19	06-AUG-19	R4739939
		16.5		2.3	mg/kg		07-AUG-19	
		0.261		0.040	dS/m	06-AUG-19	06-AUG-19	R4739817
		11.9		5.0	mg/L		06-AUG-19	R4739873
		5.4		2.3	mg/kg		07-AUG-19	
		<5.0		5.0	mg/L		06-AUG-19	R4739873
		<2.3		2.3	mg/kg		07-AUG-19	
		<5.0		5.0	mg/L		06-AUG-19	R4739873
		<2.3		2.3	mg/kg		07-AUG-19	
		5.0		2.7	mg/kg		07-AUG-19	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2318743-5	KM16-C75							
Sampled By:	CLIENT on 24-JUL-19							
Matrix:	SOIL							
Saturated Paste Extractables								
Sulfate (SO4)		11.0		6.0	mg/L	06-AUG-19	06-AUG-19	R4739939
TGR(sodic)		<0.10		0.10	t/ha		07-AUG-19	
TGR(brine)		<0.10		0.10	t/ha		07-AUG-19	
L2318743-6	KM16-C150							
Sampled By:	CLIENT on 24-JUL-19							
Matrix:	SOIL							
Physical Tests								
% Saturation		91.6		1.0	%	02-AUG-19	02-AUG-19	R4738712
Organic Matter (LOI)		10.2		0.10	%	07-AUG-19	08-AUG-19	R4743748
pH (1:2 soil:water)		6.90		0.10	pH	06-AUG-19	06-AUG-19	R4739814
pH (1:2 CaCl2)		6.23		0.10	pH	02-AUG-19	02-AUG-19	R4739805
Particle Size								
% Sand		85.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Silt		9.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
% Clay		6.0		1.0	%	02-AUG-19	06-AUG-19	R4740289
Texture		SANDY LOAM				02-AUG-19	06-AUG-19	R4740289
Plant Available Nutrients								
Available Nitrate-N		2.0		1.0	mg/kg	01-AUG-19	01-AUG-19	R4738808
Available Phosphate-P		<2.0		2.0	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Potassium		40		20	mg/kg	02-AUG-19	02-AUG-19	R4739152
Available Sulfate-S		<4.0		4.0	mg/kg	02-AUG-19	02-AUG-19	R4740489
Saturated Paste Extractables								
SAR		0.22		0.10	SAR		07-AUG-19	
Calcium (Ca)		45.8		5.0	mg/L		02-AUG-19	R4738634
Calcium (Ca)		41.9		4.6	mg/kg		07-AUG-19	
Chloride (Cl)		101		5.0	mg/L	02-AUG-19	02-AUG-19	R4738667
Chloride (Cl)		92.4		4.6	mg/kg		07-AUG-19	
Conductivity Sat. Paste		0.538		0.040	dS/m	02-AUG-19	02-AUG-19	R4737628
Magnesium (Mg)		16.9		5.0	mg/L		02-AUG-19	R4738634
Magnesium (Mg)		15.4		4.6	mg/kg		07-AUG-19	
Potassium (K)		9.0		5.0	mg/L		02-AUG-19	R4738634
Potassium (K)		8.2		4.6	mg/kg		07-AUG-19	
Sodium (Na)		7.0		5.0	mg/L		02-AUG-19	R4738634
Sodium (Na)		6.4		4.6	mg/kg		07-AUG-19	
Sulfate (SO4)		6.6		5.5	mg/kg		07-AUG-19	
Sulfate (SO4)		7.2		6.0	mg/L	02-AUG-19	02-AUG-19	R4738667
TGR(sodic)		<0.10		0.10	t/ha		07-AUG-19	
TGR(brine)		<0.10		0.10	t/ha		07-AUG-19	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)	MS-B	L2318743-1, -10, -11, -12, -2, -3, -4, -6
Matrix Spike	Magnesium (Mg)	MS-B	L2318743-1, -10, -11, -12, -2, -3, -4, -6
Matrix Spike	Sodium (Na)	MS-B	L2318743-1, -10, -11, -12, -2, -3, -4, -6

Sample Parameter Qualifier key listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
SAR:DL	SAR is incalculable due to undetectable Na. Detection Limit represents maximum possible SAR value.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-PASTE-IC-GP	Soil	Chloride in Soil (Paste) by IC	Carter-CSSS/EPA 300.1 Modified
A soil extract produced by the saturated paste extraction procedure is analyzed for Chloride by IC (Ion Chromatography)..			
EC-PASTE-GP	Soil	Conductivity (Saturated Paste)	CSSS 15.3.1 2ND ED.
Electrical conductivity of sample extracts is measured using a conductivity meter, which essentially consists of a conductance cell and a Wheatstone bridge.			
MET-PASTE-ICP-GP	Soil	Salinity Metals By ICPOES (Sat. Paste)	CSSS CH15/EPA 6010B
A soil extract produced by the saturated paste extraction procedure is analyzed for Calcium, Magnesium, Potassium, Sodium by ICPOES.			
NO3-AVAIL-SK	Soil	Available Nitrate-N	Alberta Ag (1988)
Available Nitrate and Nitrite are extracted from the soil using a dilute calcium chloride solution. Nitrate is quantitatively reduced to nitrite by passage of the sample through a copperized cadmium column. The nitrite (reduced nitrate plus original nitrite) is then determined by diazotizing with sulfanilamide followed by coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. The resulting water soluble dye has a magenta color which is measured at colorimetrically at 520nm.			
ORGANIC MATTER-GP	Soil	Organic Matter (LOI)	AAFC 1984 84-045
Weight loss between 105 C and 550 C is approximately equal to the amount of organic matter in a sample.			
PH-1:2 CaCl2-GP	Soil	pH (1:2 CaCl2)	CSSS 16.3 - 1:2 Extraction w/0.01M CaCl2
pH 1:2 Soil: 1:2 CaCl2 Extract; The pH is determined in the laboratory using a pH electrode. Field Measurement is recommended where accurate pH measurements are required, due to the 15 minute recommended hold time.			
PH-1:2-GP	Soil	pH in Soil (1:2 Soil:Water	CSSS 16.2 - pH of 1:2 water extract
pH 1:2 Soil: Water Extract; The pH is determined in the laboratory using a pH electrode. Field Measurement is recommended where accurate pH measurements are required, due to the 15 minute recommended hold time.			
PO4/K-AVAIL-SK	Soil	Plant Available Phosphorus and Potassium	Comm. Soil Sci. Plant Anal, 25 (5&6)
Plant available phosphorus and potassium are extracted from the soil using Modified Kelowna solution. Phosphorous in the soil extract is determined colorimetrically at 880 nm, while potassium is determined by flame emission at 770 nm.			
PSA-1-GP	Soil	Particle Size by Hydrometer	CSSS 55.3 - Hydrometer (modified)
Soil samples oven dried, grinded, and soaked in Calgon solution for 16 hours; soil suspensions measured for their particle size by distribution using a hydrometer after various times of settling.			
SAL-MG/KG-CALC-GP	Soil	Detailed Salinity Calculation (mg/kg)	CALCULATION
SALINITY-INTCHECK-GP	Soil		CALCULATION
SAR-PASTE-CALC-GP	Soil	Sodium Adsorption Ratio (Sat. Paste)	CSSS 15.4.4-Calculation
A soil extract produced by the saturated paste extraction procedure is analyzed for Sodium, Calcium, and Magnesium by ICPOES. Sodium Adsorption Ratio (SAR) is calculated as per "Soil Sampling and Methods of Analysis" by M. Carter.			
SAT-PCNT-GP	Soil	% Saturation	AER D50
As received samples are pasted to saturation. A sub-sample is weighed, oven dried and re-weighed to determine % saturation.			
SO4-AVAIL-SK	Soil	Available Sulfate-S	REC METH SOIL ANAL - AB. AG(1988)
Plant available sulfate in the soil is extracted using a weak calcium chloride solution. Sulfate in the extract is determined by ICP-OES. This extraction may also produce organic sulfur in the extracts when organic soils are analyzed.			
SO4-PASTE-IC-GP	Soil	Sulfate by IC (Saturated Paste)	CSSS CH15/EPA 300.1
A soil extract produced by the saturated paste extraction procedure is analyzed by Ion Chromatography with conductivity or UV detection.			
TGR2-CALC-GP	Soil	Theoretical Gypsum Requirement	J. Ashworth et al (1999)

Theoretical Gypsum Requirement is an estimate of the gypsum amendment required to remediate brine-contaminated or sodic soils, and is provided in units of tonnes per hectare (t/ha) for a treatment depth of 15cm. TGR(brine), intended for brine-contaminated soils, is calculated using Method A from "A Comparison of Methods for Gypsum Requirement of Brine-Contaminated Soils", by J. Ashworth (Cdn J. of Soil Science, 1999), available at www.alsglobal.com. TGR(sodic), intended for naturally sodic soils, uses the Oster and Frenkel method (Method B) from the same paper. Reported TGR values are capped at 50 t/ha, considered the maximum practical gypsum amendment. To convert TGR from t/ha to tons/acre, multiply by 0.446. To determine a TGR value for an alternate treatment depth, multiply by [desired treatment depth (cm) / 15 cm].

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
GP	ALS ENVIRONMENTAL - GRANDE PRAIRIE, ALBERTA, CANADA

Chain of Custody Numbers:

17-706508

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample
- mg/kg ww - milligrams per kilogram based on wet weight of sample
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample
- mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



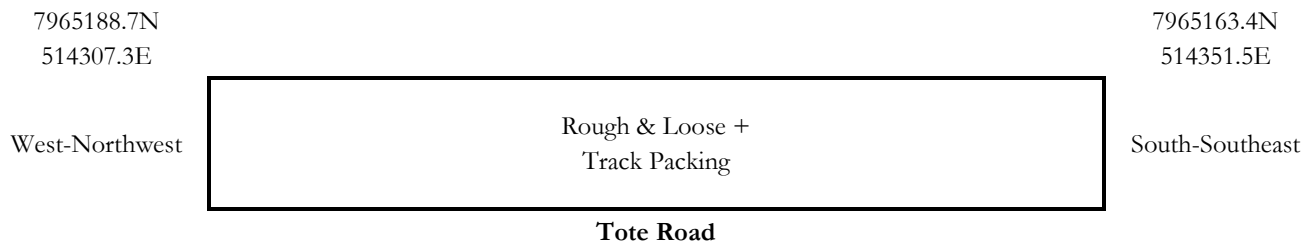
3. KM18 | 2021 SURVEY



Appendix B-3: Table 1. KM18 — Georeferencing (NAD1983 UTM Zone 17N).

Survey Area	Survey Location	Identifier/Activity	Northing	Easting
Disturbed	KM18-0	Vegetation Quadrat + Soil Pit	7965153.4	514351.5
	KM18-50	Vegetation Quadrat + Soil Pit	7965201.6	514261.6
	KM18-100	Vegetation Quadrat + Soil Pit	7965176.9	514307.3
Control	KM18-C0	Vegetation Quadrat + Soil Pit	7965188.7	514369.8
	KM18-C50	Vegetation Quadrat + Soil Pit	7965222.6	514332.7
	KM18-C100	Vegetation Quadrat + Soil Pit	7965256.4	514297.6

Appendix B-3: Table 2. KM18 — Reclamation Trial — Georeferencing (NAD1983 UTM Zone 17N).





Baffinland Iron Mine's Corporation
(Oakville)
ATTN: Connor Devereaux/Kendra Button
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 05-AUG-21
Report Date: 16-AUG-21 16:12 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2622738

Project P.O. #: 4500090295

Job Reference: BIM RECLAMATION TRIAL - SOIL SAMPLES

C of C Numbers:

Legal Site Desc:

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-7 KM 18.5 - CONTROL 100M Sampled By: JR/MK on 21-JUL-21 @ 16:00 Matrix: SOIL							
Physical Tests							
Loss on Ignition @ 375 C	<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter	1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)	6.37		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)	1.7		1.0	%	10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-7 KM 18.5 - CONTROL 100M Sampled By: JR/MK on 21-JUL-21 @ 16:00 Matrix: SOIL								
Particle Size								
% Sand (1.00mm - 0.50mm)		18.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		48.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		23.8		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		2.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		1.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		1.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		1.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		<0.30	SAR:DL	0.30	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		3.6		1.5	mg/kg		11-AUG-21	
Calcium (Ca)		12.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<3.0		3.0	mg/kg		11-AUG-21	
Conductivity Sat. Paste		0.11		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		1.6		1.5	mg/kg		11-AUG-21	
Magnesium (Mg)		5.4		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.5		1.5	mg/kg		11-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		29.6		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.5		1.5	mg/kg		11-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		1.8		1.5	mg/kg		11-AUG-21	
Sulfur (as SO4)		6.1		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		<0.10		0.10	t/ha		11-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		11-AUG-21	
L2622738-8 KM 18.5 - CONTROL 50M Sampled By: JR/MK on 21-JUL-21 @ 15:50 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		6.88		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		1.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		14.7		1.0	%	10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-8 KM 18.5 - CONTROL 50M Sampled By: JR/MK on 21-JUL-21 @ 15:50 Matrix: SOIL								
Particle Size								
% Sand (0.50mm - 0.25mm)		51.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		24.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		2.5		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		2.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		2.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		1.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		1.7		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		<0.20	SAR:DL	0.20	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		10.6		1.5	mg/kg		11-AUG-21	
Calcium (Ca)		36.6		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<2.9		2.9	mg/kg		11-AUG-21	
Conductivity Sat. Paste		0.24		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.5		1.5	mg/kg		11-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.5		1.5	mg/kg		11-AUG-21	
Potassium (K)		5.1		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		29.1		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.5		1.5	mg/kg		11-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		<1.5		1.5	mg/kg		11-AUG-21	
Sulfur (as SO4)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		<0.10		0.10	t/ha		11-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		11-AUG-21	
L2622738-9 KM 18.5 - CONTROL 0M Sampled By: JR/MK on 21-JUL-21 @ 14:30 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		6.76		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		1.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		15.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		54.3		1.0	%	10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-9 KM 18.5 - CONTROL 0M Sampled By: JR/MK on 21-JUL-21 @ 14:30 Matrix: SOIL								
Particle Size								
% Sand (0.25mm - 0.125mm)		25.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		1.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		<0.20	SAR:DL	0.20	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		7.5		1.5	mg/kg		11-AUG-21	
Calcium (Ca)		24.9		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<3.0		3.0	mg/kg		11-AUG-21	
Conductivity Sat. Paste		0.18		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		1.5		1.5	mg/kg		11-AUG-21	
Magnesium (Mg)		5.1		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.5		1.5	mg/kg		11-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		30.1		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.5		1.5	mg/kg		11-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		3.8		1.5	mg/kg		11-AUG-21	
Sulfur (as SO4)		12.5		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		<0.10		0.10	t/ha		11-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		11-AUG-21	
L2622738-10 KM 18.5 - D100M Sampled By: JR/MK on 24-JUL-21 @ 10:05 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		1.8		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		1.7		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		6.96		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		10.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		52.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		28.7		1.0	%	10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-10 KM 18.5 - D100M Sampled By: JR/MK on 24-JUL-21 @ 10:05 Matrix: SOIL								
Particle Size								
% Sand (0.125mm - 0.063mm)		2.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		2.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		2.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		0.18		0.10	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		16.8		1.9	mg/kg		11-AUG-21	
Calcium (Ca)		45.1		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		23		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		8.4		3.7	mg/kg		11-AUG-21	
Conductivity Sat. Paste		0.32		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		3.8		1.9	mg/kg		11-AUG-21	
Magnesium (Mg)		10.2		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.9		1.9	mg/kg		11-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		37.3		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		1.9		1.9	mg/kg		11-AUG-21	
Sodium (Na)		5.2		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		2.9		1.9	mg/kg		11-AUG-21	
Sulfur (as SO4)		7.8		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		<0.10		0.10	t/ha		11-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		11-AUG-21	
L2622738-11 KM 18.5 - D50M Sampled By: JR/MK on 24-JUL-21 @ 09:40 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		6.85		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		2.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		20.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		47.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		20.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		2.3		1.0	%	10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-11 KM 18.5 - D50M Sampled By: JR/MK on 24-JUL-21 @ 09:40 Matrix: SOIL								
Particle Size								
% Silt (0.063mm - 0.0312mm)		2.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		2.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		1.5		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		<0.20	SAR:DL	0.20	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		8.0		1.4	mg/kg		11-AUG-21	
Calcium (Ca)		28.2		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<2.8		2.8	mg/kg		11-AUG-21	
Conductivity Sat. Paste		0.21		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		2.3		1.4	mg/kg		11-AUG-21	
Magnesium (Mg)		8.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.4		1.4	mg/kg		11-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		28.4		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.4		1.4	mg/kg		11-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		3.9		1.4	mg/kg		11-AUG-21	
Sulfur (as SO4)		13.7		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		<0.10		0.10	t/ha		11-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		11-AUG-21	
L2622738-12 KM 18.5 - D0M Sampled By: JR/MK on 24-JUL-21 @ 09:00 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		7.11		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		1.8		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		13.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		47.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		29.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		2.5		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		1.9		1.0	%	10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-12 KM 18.5 - D0M Sampled By: JR/MK on 24-JUL-21 @ 09:00 Matrix: SOIL							
Particle Size							
% Silt (0.0312mm - 0.004mm)	1.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)	1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture	Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients							
Available Nitrate-N	<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P	<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium	<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S	<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables							
SAR	<0.20	SAR:DL	0.20	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)	8.7		1.6	mg/kg		11-AUG-21	
Calcium (Ca)	27.9		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)	<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)	<3.1		3.1	mg/kg		11-AUG-21	
Conductivity Sat. Paste	0.19		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)	1.9		1.6	mg/kg		11-AUG-21	
Magnesium (Mg)	6.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)	<1.6		1.6	mg/kg		11-AUG-21	
Potassium (K)	<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation	31.3		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)	<1.6		1.6	mg/kg		11-AUG-21	
Sodium (Na)	<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)	2.3		1.6	mg/kg		11-AUG-21	
Sulfur (as SO4)	7.2		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)	<0.10		0.10	t/ha		11-AUG-21	
TGR(brine)	<0.10		0.10	t/ha		11-AUG-21	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
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Sample Parameter Qualifier key listed:

Qualifier	Description
SAR:DL	SAR is incalculable due to undetectable Na. Detection Limit represents maximum possible SAR value.
SAR:INC	SAR is incalculable due to Ca, Mg below detection limit.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-PASTE-COL-SK	Soil	Chloride (Cl) (Saturated Paste)	CSSS 15.2.1/ APHA 4500-Cl E
A soil extract is produced by the saturated paste extraction procedure. The extract is analyzed for Chloride by Colourimetry using a discrete analyzer.			
EC-SAR-SK	Soil	EC (Saturated Paste)	CSSS 18.2.2/CSSS 18.3.1
After saturated soil paste equilibrium, an extract is obtained by vacuum filtration with conductivity of the extract measured by a conductivity meter.			
NO3-AVAIL-SK	Soil	Available Nitrate-N	Alberta Ag / APHA 4500 NO3F
Available Nitrate and Nitrite are extracted from the soil using a dilute calcium chloride solution. Nitrate is quantitatively reduced to nitrite by passing of the sample through a copperized cadmium column. The nitrite (reduced nitrate plus original nitrite) is then determined by diazotizing with sulfanilamide followed by coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. The resulting water soluble dye has a magenta color which is measured at colorimetrically at 520nm.			
OM-LOI-SK	Soil	Organic Matter by LOI at 375 deg C.	CSSS (1978) p. 160
The dry-ash method involves the removal of organic matter by combustion at 375 degrees C for a minimum of 16 hours. Samples are dried prior to combustion.			
PH-1:2CACL2-SK	Soil	pH (1:2 Soil:CaCl2 Extraction)	CSSS 2008 16.3
1 part dry soil and 2 parts de-ionized 0.01M CaCl2 (by volume) is mixed. The slurry is allowed to stand with occasional stirring for 30 - 60 minutes. pH of the soil slurry is then measured using a pH meter.			
PO4/K-AVAIL-SK	Soil	Plant Available Phosphorus and Potassium	Comm. Soil Sci. Plant Anal, 25 (5&6)
Plant available phosphorus and potassium are extracted from the soil usng Modified Kelowna solution. Phosphorous in the soil extract is determined colorimetrically at 880 nm, while potassiumis determined by flame emission at 770 nm.			
PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1
Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.			
SAL-MG/KG-CALC-SK	Soil	Detail Salinity in mg/kg	Manual Calculation
SALINITY-INTCHECK-SK	Soil		CSSS 18.4-Calculation
SAR-CALC-SO4-SK	Soil	SAR, Cations and SO4 in saturated soil	APHA 3120B
Ca, Mg, Na, K and SO4 in a saturated soil extract are determined by ICP-OES.			
SAT-PCNT-SK	Soil	Saturated Paste	CSSS Ch. 15
A saturated paste is generated by adding water to soil with mixing until the following criteria are met.: The sample paste glistens as it reflects light. The sample flows slightly when container is tipped, and slides freely and cleanly off the spatula. A trench carved in the soil surface will close readily upon jarring the container. There should be no free layer of water on top of the sample. An aliquot of the sample is obtained, dried at 105C and saturation percentage is determined.			
SO4-AVAIL-SK	Soil	Available Sulfate-S	REC METH SOIL ANAL - AB. AG(1988)
Plant available sulfate in the soil is extracted using a weak calcium chloride solution. Sulfate in the extract is determined by ICP-OES. This extraction may also produce organic sulfur in the extracts when organic soils are analyzed.			
TGR2-CALC-SK	Soil	Theoretical Gypsum Requirement	J. Ashworth et al (1999)

Theoretical Gypsum Requirement is an estimate of the gypsum amendment required to remediate brine-contaminated or sodic soils, and is provided in units of tonnes per hectare (t/ha) for a treatment depth of 15cm. TGR(brine), intended for brine-contaminated soils, is calculated using Method A from "A Comparison of Methods for Gypsum Requirement of Brine-Contaminated Soils", by J. Ashworth (Cdn J. of Soil Science, 1999), available at www.alsglobal.com. TGR(sodic), intended for naturally sodic soils, uses the Oster and Frenkel method (Method B) from the same paper. Reported TGR values are capped at 50 t/ha, considered the maximum practical gypsum amendment. To convert TGR from t/ha to tons/acre, multiply by 0.446.

Reference Information

To determine a TGR value for an alternate treatment depth, multiply by [desired treatment depth (cm) / 15 cm].

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample
- mg/kg wwwt - milligrams per kilogram based on wet weight of sample
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample
- mg/L - unit of concentration based on volume, parts per million.
- < - Less than.
- D.L. - The reporting limit.
- N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



4. KM58 | 2021 SURVEY



Appendix B-4: Table 1. KM58 — Georeferencing (NAD1983 UTM Zone 17N).

Study Zone	Survey Area	Survey Location	Identifier/Activity	Northing	Easting
Area1	Disturbed	KM58-0	Vegetation Quadrat + Soil Pit	7930265.6	527483.1
		KM58-75	Vegetation Quadrat + Soil Pit	7930192.3	527503.7
		KM58-150	Vegetation Quadrat + Soil Pit	7930119.3	527523.716
	Control	KM58-C0	Vegetation Quadrat + Soil Pit	7930260.4	527438.1
		KM58-C75	Vegetation Quadrat + Soil Pit	7930188.3	527457.7
		KM58-C150	Vegetation Quadrat + Soil Pit	7930118.8	527479.2
Study Zone	Survey Area	Survey Location	Identifier/Activity	Northing	Easting
Area2	Disturbed	KM58-0	Vegetation Quadrat + Soil Pit	7930033.8	527548.2
		KM58-75	Vegetation Quadrat + Soil Pit	7929959.7	527566.6
		KM58-150	Vegetation Quadrat + Soil Pit	7929889	527585
	Control	KM58-C0	Vegetation Quadrat + Soil Pit	7930032.2	527503.7
		KM58-C75	Vegetation Quadrat + Soil Pit	7929959.3	527515
		KM58-C150	Vegetation Quadrat + Soil Pit	7929887.2	527537
Study Zone	Survey Area	Survey Location	Identifier/Activity	Northing	Easting
Area3	Disturbed	KM58-0	Vegetation Quadrat + Soil Pit	7929819.3	527602.1
		KM58-75	Vegetation Quadrat + Soil Pit	7929747.8	527620.1
		KM58-150	Vegetation Quadrat + Soil Pit	7929674	527637.8
	Control	KM58-C0	Vegetation Quadrat + Soil Pit	7929822.9	527558.9
		KM58-C75	Vegetation Quadrat + Soil Pit	7929746.8	527575.5
		KM58-C150	Vegetation Quadrat + Soil Pit	7929672.5	527596.9



Baffinland Iron Mine's Corporation
(Oakville)
ATTN: Connor Devereaux/Kendra Button
2275 Upper Middle Rd. E.
Suite #300
Oakville ON L6H 0C3

Date Received: 05-AUG-21
Report Date: 16-AUG-21 16:12 (MT)
Version: FINAL

Client Phone: 647-253-0596

Certificate of Analysis

Lab Work Order #: L2622738
Project P.O. #: 4500090295
Job Reference: BIM RECLAMATION TRIAL - SOIL SAMPLES
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-1 KM 58 - PLOT 2 D150M Sampled By: JR/MK on 22-JUL-21 @ 15:05 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		4.70		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		3.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		20.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		22.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		48.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		2.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		Incalculable	SAR:INC	0.10	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		<1.4		1.4	mg/kg		14-AUG-21	
Calcium (Ca)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<2.8		2.8	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.4		1.4	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.4		1.4	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		28.1		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.4		1.4	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		<1.4		1.4	mg/kg		14-AUG-21	
Sulfur (as SO4)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		N/A		0.10	t/ha		14-AUG-21	
TGR(brine)		N/A		0.10	t/ha		14-AUG-21	
L2622738-2 KM 58 - PLOT 2 D75M Sampled By: JR/MK on 22-JUL-21 @ 14:20 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-2 KM 58 - PLOT 2 D75M Sampled By: JR/MK on 22-JUL-21 @ 14:20 Matrix: SOIL								
Physical Tests								
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		5.45		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		2.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		13.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		35.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		39.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		8.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		Incalculable	SAR:INC	0.10	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		<1.3		1.3	mg/kg		14-AUG-21	
Calcium (Ca)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<2.5		2.5	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.3		1.3	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.3		1.3	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		25.2		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.3		1.3	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		<1.3		1.3	mg/kg		14-AUG-21	
Sulfur (as SO4)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		N/A		0.10	t/ha		14-AUG-21	
TGR(brine)		N/A		0.10	t/ha		14-AUG-21	
L2622738-3 KM 58 - PLOT 2 D0M Sampled By: JR/MK on 22-JUL-21 @ 13:45 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		2.2		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		2.0		1.0	%	10-AUG-21	12-AUG-21	R5549996

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-3 KM 58 - PLOT 2 D0M Sampled By: JR/MK on 22-JUL-21 @ 13:45 Matrix: SOIL								
Physical Tests								
pH (1:2 CaCl2)		4.88		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		2.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		8.8		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		23.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		35.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		21.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		2.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		2.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		2.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		1.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		Incalculable	SAR:INC	0.10	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		<1.6		1.6	mg/kg		14-AUG-21	
Calcium (Ca)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<3.2		3.2	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.6		1.6	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.6		1.6	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		32.4		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.6		1.6	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		2.2		1.6	mg/kg		14-AUG-21	
Sulfur (as SO4)		6.9		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		N/A		0.10	t/ha		14-AUG-21	
TGR(brine)		N/A		0.10	t/ha		14-AUG-21	
L2622738-4 KM 58 - PLOT 2 C150M Sampled By: JR/MK on 24-JUL-21 @ 13:07 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		4.65		0.10	pH	09-AUG-21	09-AUG-21	R5546928

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-4 KM 58 - PLOT 2 C150M Sampled By: JR/MK on 24-JUL-21 @ 13:07 Matrix: SOIL								
Physical Tests								
Particle Size								
% Gravel (>2mm)		2.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		4.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		25.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		38.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		25.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		1.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		Incalculable	SAR:INC	0.10	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		<1.3		1.3	mg/kg		14-AUG-21	
Calcium (Ca)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<2.5		2.5	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.3		1.3	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.3		1.3	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		25.3		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.3		1.3	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		3.5		1.3	mg/kg		14-AUG-21	
Sulfur (as SO4)		13.9		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		N/A		0.10	t/ha		14-AUG-21	
TGR(brine)		N/A		0.10	t/ha		14-AUG-21	
L2622738-5 KM 58 - PLOT 2 C75M Sampled By: JR/MK on 24-JUL-21 @ 13:25 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		4.47		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-5 KM 58 - PLOT 2 C75M Sampled By: JR/MK on 24-JUL-21 @ 13:25 Matrix: SOIL								
Particle Size								
% Gravel (>2mm)		1.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		4.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		16.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		41.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		33.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		Incalculable	SAR:INC	0.10	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		<1.4		1.4	mg/kg		14-AUG-21	
Calcium (Ca)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<2.7		2.7	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.4		1.4	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.4		1.4	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		27.4		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.4		1.4	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		1.5		1.4	mg/kg		14-AUG-21	
Sulfur (as SO4)		5.4		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		N/A		0.10	t/ha		14-AUG-21	
TGR(brine)		N/A		0.10	t/ha		14-AUG-21	
L2622738-6 KM 58 - PLOT 2 C0M Sampled By: JR/MK on 24-JUL-21 @ 14:00 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		4.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		3.4		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		6.08		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		3.2		1.0	%	10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-6 KM 58 - PLOT 2 COM Sampled By: JR/MK on 24-JUL-21 @ 14:00 Matrix: SOIL								
Particle Size								
% Sand (2.00mm - 1.00mm)		2.8		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		16.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		40.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		26.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		2.5		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		3.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		3.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		1.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		<0.50	SAR:DL	0.50	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		3.5		2.4	mg/kg		14-AUG-21	
Calcium (Ca)		7.2		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<4.8		4.8	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<2.4		2.4	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		2.5		2.4	mg/kg		14-AUG-21	
Potassium (K)		5.2		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		48.0		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<2.4		2.4	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		8.3		2.4	mg/kg		14-AUG-21	
Sulfur (as SO4)		17.3		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		<0.10		0.10	t/ha		14-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		14-AUG-21	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-13 KM 58 - PLOT 1 C150M Sampled By: JR/MK on 26-JUL-21 @ 13:55 Matrix: SOIL								
Particle Size								
% Clay (<4um)		1.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		<0.50	SAR:DL	0.50	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		4.0		2.7	mg/kg		14-AUG-21	
Calcium (Ca)		7.4		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<5.4		5.4	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<2.7		2.7	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		2.9		2.7	mg/kg		14-AUG-21	
Potassium (K)		5.5		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		53.6		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<2.7		2.7	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		6.9		2.7	mg/kg		14-AUG-21	
Sulfur (as SO4)		13.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		<0.10		0.10	t/ha		14-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		14-AUG-21	
L2622738-14 KM 58 - PLOT 1 C75M Sampled By: JR/MK on 26-JUL-21 @ 14:22 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		4.51		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		1.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		2.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		8.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		40.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		42.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		1.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-14 KM 58 - PLOT 1 C75M Sampled By: JR/MK on 26-JUL-21 @ 14:22 Matrix: SOIL								
Particle Size								
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		Incalculable	SAR:INC	0.10	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		<1.4		1.4	mg/kg		14-AUG-21	
Calcium (Ca)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<2.8		2.8	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.4		1.4	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.4		1.4	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		27.8		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.4		1.4	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		<1.4		1.4	mg/kg		14-AUG-21	
Sulfur (as SO4)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		N/A		0.10	t/ha		14-AUG-21	
TGR(brine)		N/A		0.10	t/ha		14-AUG-21	
L2622738-15 KM 58 - PLOT 1 C0M Sampled By: JR/MK on 26-JUL-21 @ 14:40 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		5.06		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		2.5		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		7.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		49.5		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		31.7		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		7.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-15	KM 58 - PLOT 1 COM							
Sampled By:	JR/MK on 26-JUL-21 @ 14:40							
Matrix:	SOIL							
Particle Size								
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Potassium		<20		20	mg/kg	11-AUG-21	11-AUG-21	R5549241
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		Incalculable	SAR:INC	0.10	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		<1.3		1.3	mg/kg		14-AUG-21	
Calcium (Ca)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<2.5		2.5	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.3		1.3	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.3		1.3	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		25.2		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.3		1.3	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		<1.3		1.3	mg/kg		14-AUG-21	
Sulfur (as SO4)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		N/A		0.10	t/ha		14-AUG-21	
TGR(brine)		N/A		0.10	t/ha		14-AUG-21	
L2622738-16	KM 58 - PLOT 1 D150M							
Sampled By:	JR/MK on 22-JUL-21 @ 10:58							
Matrix:	SOIL							
Physical Tests								
Loss on Ignition @ 375 C		1.7		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		1.6		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		4.36		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		5.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		7.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		37.5		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		37.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		8.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		1.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		1.5		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-16	KM 58 - PLOT 1 D150M							
Sampled By:	JR/MK on 22-JUL-21 @ 10:58							
Matrix:	SOIL							
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P		<2.0		2.0	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Potassium		<20		20	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Sulfate-S		<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables								
SAR		<0.60	SAR:DL	0.60	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)		1.8		1.6	mg/kg		14-AUG-21	
Calcium (Ca)		5.5		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)		<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)		<3.3		3.3	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)		<1.6		1.6	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)		<1.6		1.6	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation		32.8		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)		<1.6		1.6	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)		2.5		1.6	mg/kg		14-AUG-21	
Sulfur (as SO4)		7.5		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)		<0.10		0.10	t/ha		14-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		14-AUG-21	
L2622738-17	KM 58 - PLOT 1 D75M							
Sampled By:	JR/MK on 22-JUL-21 @ 10:45							
Matrix:	SOIL							
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)		5.52		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size								
% Gravel (>2mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)		10.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)		42.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)		39.8		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)		5.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture		Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-17 KM 58 - PLOT 1 D75M Sampled By: JR/MK on 22-JUL-21 @ 10:45 Matrix: SOIL Plant Available Nutrients							
Available Phosphate-P	<2.0		2.0	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Potassium	<20		20	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Sulfate-S	<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
Saturated Paste Extractables							
SAR	<0.50	SAR:DL	0.50	SAR	11-AUG-21	11-AUG-21	R5548444
Calcium (Ca)	1.7		1.3	mg/kg		14-AUG-21	
Calcium (Ca)	6.3		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Chloride (Cl)	<10		10	mg/L	11-AUG-21	11-AUG-21	R5548463
Chloride (Cl)	<2.7		2.7	mg/kg		14-AUG-21	
Conductivity Sat. Paste	<0.10		0.10	dS m-1	10-AUG-21	11-AUG-21	R5548472
Magnesium (Mg)	<1.3		1.3	mg/kg		14-AUG-21	
Magnesium (Mg)	<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Potassium (K)	<1.3		1.3	mg/kg		14-AUG-21	
Potassium (K)	<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
% Saturation	26.5		1.0	%	10-AUG-21	11-AUG-21	R5548472
Sodium (Na)	<1.3		1.3	mg/kg		14-AUG-21	
Sodium (Na)	<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
Sulfur (as SO4)	<1.3		1.3	mg/kg		14-AUG-21	
Sulfur (as SO4)	<5.0		5.0	mg/L	11-AUG-21	11-AUG-21	R5548444
TGR(sodic)	<0.10		0.10	t/ha		14-AUG-21	
TGR(brine)	<0.10		0.10	t/ha		14-AUG-21	
L2622738-18 KM 58 - PLOT 1 OM - DISTURBED Sampled By: JR/MK on 19-JUL-21 @ 14:00 Matrix: SOIL Physical Tests							
Loss on Ignition @ 375 C	<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
Organic Matter	<1.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
pH (1:2 CaCl2)	4.51		0.10	pH	09-AUG-21	09-AUG-21	R5546928
Particle Size							
% Gravel (>2mm)	3.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (2.00mm - 1.00mm)	5.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (1.00mm - 0.50mm)	16.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.50mm - 0.25mm)	43.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.25mm - 0.125mm)	23.0		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Sand (0.125mm - 0.063mm)	3.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.063mm - 0.0312mm)	1.8		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Silt (0.0312mm - 0.004mm)	1.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
% Clay (<4um)	1.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
Texture	Sand				10-AUG-21	12-AUG-21	R5548985
Plant Available Nutrients							
Available Nitrate-N	<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
Available Phosphate-P	<2.0		2.0	mg/kg	12-AUG-21	12-AUG-21	R5549242

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-18 KM 58 - PLOT 1 OM - DISTURBED Sampled By: JR/MK on 19-JUL-21 @ 14:00 Matrix: SOIL Plant Available Nutrients Available Potassium							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-19 KM 58 - PLOT 3 C0M Sampled By: JR/MK on 23-JUL-21 @ 15:10 Matrix: SOIL Plant Available Nutrients Available Sulfate-S Saturated Paste Extractables SAR Calcium (Ca) Calcium (Ca) Chloride (Cl) Chloride (Cl) Conductivity Sat. Paste Magnesium (Mg) Magnesium (Mg) Potassium (K) Potassium (K) % Saturation Sodium (Na) Sodium (Na) Sulfur (as SO4) Sulfur (as SO4) TGR(sodic) TGR(brine)	<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516
	Incalculable	SAR:INC	0.10	SAR	13-AUG-21	13-AUG-21	R5550009
	<1.4		1.4	mg/kg		14-AUG-21	
	<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
	<10		10	mg/L	13-AUG-21	13-AUG-21	R5549854
	<2.9		2.9	mg/kg		14-AUG-21	
	<0.10		0.10	dS m-1	12-AUG-21	13-AUG-21	R5549936
	<1.4		1.4	mg/kg		14-AUG-21	
	<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
	<1.4		1.4	mg/kg		14-AUG-21	
	<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
	28.9		1.0	%	12-AUG-21	13-AUG-21	R5549936
	<1.4		1.4	mg/kg		14-AUG-21	
	<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
	2.2		1.4	mg/kg		14-AUG-21	
	7.8		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
	N/A		0.10	t/ha		14-AUG-21	
	N/A		0.10	t/ha		14-AUG-21	
L2622738-20 KM 58 - PLOT 3 C75M Sampled By: JR/MK on 23-JUL-21 @ 14:35 Matrix: SOIL Physical Tests Loss on Ignition @ 375 C Organic Matter pH (1:2 CaCl2) Particle Size % Gravel (>2mm) % Sand (2.00mm - 1.00mm) % Sand (1.00mm - 0.50mm) % Sand (0.50mm - 0.25mm) % Sand (0.25mm - 0.125mm) % Sand (0.125mm - 0.063mm) % Silt (0.063mm - 0.0312mm) % Silt (0.0312mm - 0.004mm) % Clay (<4um) Texture Plant Available Nutrients Available Nitrate-N Available Phosphate-P Available Potassium Available Sulfate-S	2.0		1.0	%	10-AUG-21	12-AUG-21	R5549996
	1.8		1.0	%	10-AUG-21	12-AUG-21	R5549996
	4.67		0.10	pH	09-AUG-21	09-AUG-21	R5546928
	5.8		1.0	%	10-AUG-21	12-AUG-21	R5548985
	5.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
	12.9		1.0	%	10-AUG-21	12-AUG-21	R5548985
	36.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
	27.2		1.0	%	10-AUG-21	12-AUG-21	R5548985
	5.1		1.0	%	10-AUG-21	12-AUG-21	R5548985
	3.3		1.0	%	10-AUG-21	12-AUG-21	R5548985
	2.6		1.0	%	10-AUG-21	12-AUG-21	R5548985
	1.4		1.0	%	10-AUG-21	12-AUG-21	R5548985
	Sand				10-AUG-21	12-AUG-21	R5548985
	<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548495
	2.7		2.0	mg/kg	12-AUG-21	12-AUG-21	R5549242
	<20		20	mg/kg	12-AUG-21	12-AUG-21	R5549242
	<3.0		3.0	mg/kg	13-AUG-21	13-AUG-21	R5552516

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-20	KM 58 - PLOT 3 C75M							
Sampled By:	JR/MK on 23-JUL-21 @ 14:35							
Matrix:	SOIL							
Plant Available Nutrients								
Saturated Paste Extractables								
SAR		<0.60	SAR:DL	0.60	SAR	13-AUG-21	13-AUG-21	R5550009
Calcium (Ca)		1.9		1.6	mg/kg		14-AUG-21	
Calcium (Ca)		5.8		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Chloride (Cl)		<10		10	mg/L	13-AUG-21	13-AUG-21	R5549854
Chloride (Cl)		<3.3		3.3	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	12-AUG-21	13-AUG-21	R5549936
Magnesium (Mg)		<1.6		1.6	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Potassium (K)		<1.6		1.6	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
% Saturation		32.5		1.0	%	12-AUG-21	13-AUG-21	R5549936
Sodium (Na)		<1.6		1.6	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Sulfur (as SO4)		2.5		1.6	mg/kg		14-AUG-21	
Sulfur (as SO4)		7.6		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
TGR(sodic)		<0.10		0.10	t/ha		14-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		14-AUG-21	
L2622738-21	KM 58 - PLOT 3 C150M							
Sampled By:	JR/MK on 23-JUL-21 @ 12:10							
Matrix:	SOIL							
Physical Tests								
Loss on Ignition @ 375 C		<1.0		1.0	%	10-AUG-21	11-AUG-21	R5548257
Organic Matter		<1.0		1.0	%	10-AUG-21	11-AUG-21	R5548257
pH (1:2 CaCl2)		5.87		0.10	pH	13-AUG-21	13-AUG-21	R5550037
Particle Size								
% Gravel (>2mm)		8.9		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (2.00mm - 1.00mm)		7.7		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (1.00mm - 0.50mm)		18.0		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.50mm - 0.25mm)		36.8		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.25mm - 0.125mm)		23.7		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.125mm - 0.063mm)		2.3		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Silt (0.063mm - 0.0312mm)		1.1		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Silt (0.0312mm - 0.004mm)		1.0		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	11-AUG-21	R5548430
Texture		Sand				10-AUG-21	11-AUG-21	R5548430
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548494
Available Phosphate-P		12.4		2.0	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Potassium		<20		20	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Sulfate-S		<3.0		3.0	mg/kg	12-AUG-21	12-AUG-21	R5549251
Saturated Paste Extractables								

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-21	KM 58 - PLOT 3 C150M							
Sampled By:	JR/MK on 23-JUL-21 @ 12:10							
Matrix:	SOIL							
Saturated Paste Extractables								
SAR		<0.50	SAR:DL	0.50	SAR	13-AUG-21	13-AUG-21	R5550009
Calcium (Ca)		1.8		1.3	mg/kg		14-AUG-21	
Calcium (Ca)		7.2		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Chloride (Cl)		<10		10	mg/L	13-AUG-21	13-AUG-21	R5549854
Chloride (Cl)		<2.6		2.6	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	12-AUG-21	13-AUG-21	R5549936
Magnesium (Mg)		<1.3		1.3	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Potassium (K)		<1.3		1.3	mg/kg		14-AUG-21	
Potassium (K)		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
% Saturation		25.8		1.0	%	12-AUG-21	13-AUG-21	R5549936
Sodium (Na)		<1.3		1.3	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Sulfur (as SO4)		1.7		1.3	mg/kg		14-AUG-21	
Sulfur (as SO4)		6.7		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
TGR(sodic)		<0.10		0.10	t/ha		14-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		14-AUG-21	
L2622738-22	KM 58 - PLOT 3 D0M							
Sampled By:	JR/MK on 23-JUL-21 @ 09:45							
Matrix:	SOIL							
Physical Tests								
Loss on Ignition @ 375 C		1.3		1.0	%	10-AUG-21	11-AUG-21	R5548257
Organic Matter		1.3		1.0	%	10-AUG-21	11-AUG-21	R5548257
pH (1:2 CaCl2)		5.35		0.10	pH	13-AUG-21	13-AUG-21	R5550037
Particle Size								
% Gravel (>2mm)		2.8		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (2.00mm - 1.00mm)		4.3		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (1.00mm - 0.50mm)		10.2		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.50mm - 0.25mm)		32.5		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.25mm - 0.125mm)		42.5		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.125mm - 0.063mm)		4.5		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Silt (0.063mm - 0.0312mm)		1.7		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Silt (0.0312mm - 0.004mm)		1.1		1.0	%	10-AUG-21	11-AUG-21	R5548430
% Clay (<4um)		<1.0		1.0	%	10-AUG-21	11-AUG-21	R5548430
Texture		Sand				10-AUG-21	11-AUG-21	R5548430
Plant Available Nutrients								
Available Nitrate-N		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548494
Available Phosphate-P		<2.0		2.0	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Potassium		<20		20	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Sulfate-S		<3.0		3.0	mg/kg	12-AUG-21	12-AUG-21	R5549251
Saturated Paste Extractables								
SAR		<0.50	SAR:DL	0.50	SAR	13-AUG-21	13-AUG-21	R5550009

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-22 KM 58 - PLOT 3 D0M Sampled By: JR/MK on 23-JUL-21 @ 09:45 Matrix: SOIL								
Saturated Paste Extractables								
Calcium (Ca)	2.0			1.5	mg/kg		14-AUG-21	
Calcium (Ca)	6.7			5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Chloride (Cl)	<10			10	mg/L	13-AUG-21	13-AUG-21	R5549854
Chloride (Cl)	<3.0			3.0	mg/kg		14-AUG-21	
Conductivity Sat. Paste	<0.10			0.10	dS m-1	12-AUG-21	13-AUG-21	R5549936
Magnesium (Mg)	<1.5			1.5	mg/kg		14-AUG-21	
Magnesium (Mg)	<5.0			5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Potassium (K)	<1.5			1.5	mg/kg		14-AUG-21	
Potassium (K)	<5.0			5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
% Saturation	30.4			1.0	%	12-AUG-21	13-AUG-21	R5549936
Sodium (Na)	<1.5			1.5	mg/kg		14-AUG-21	
Sodium (Na)	<5.0			5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Sulfur (as SO4)	1.8			1.5	mg/kg		14-AUG-21	
Sulfur (as SO4)	5.9			5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
TGR(sodic)	<0.10			0.10	t/ha		14-AUG-21	
TGR(brine)	<0.10			0.10	t/ha		14-AUG-21	
L2622738-23 KM 58 - PLOT 3 D75M Sampled By: JR/MK on 23-JUL-21 @ 10:40 Matrix: SOIL								
Physical Tests								
Loss on Ignition @ 375 C	3.5			1.0	%	10-AUG-21	11-AUG-21	R5548257
Organic Matter	3.0			1.0	%	10-AUG-21	11-AUG-21	R5548257
pH (1:2 CaCl2)	4.31			0.10	pH	13-AUG-21	13-AUG-21	R5550037
Particle Size								
% Gravel (>2mm)	4.4			1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (2.00mm - 1.00mm)	13.3			1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (1.00mm - 0.50mm)	29.2			1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.50mm - 0.25mm)	33.5			1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.25mm - 0.125mm)	11.8			1.0	%	10-AUG-21	11-AUG-21	R5548430
% Sand (0.125mm - 0.063mm)	1.5			1.0	%	10-AUG-21	11-AUG-21	R5548430
% Silt (0.063mm - 0.0312mm)	2.7			1.0	%	10-AUG-21	11-AUG-21	R5548430
% Silt (0.0312mm - 0.004mm)	3.1			1.0	%	10-AUG-21	11-AUG-21	R5548430
% Clay (<4um)	<1.0			1.0	%	10-AUG-21	11-AUG-21	R5548430
Texture	Sand					10-AUG-21	11-AUG-21	R5548430
Plant Available Nutrients								
Available Nitrate-N	<1.0			1.0	mg/kg	11-AUG-21	11-AUG-21	R5548494
Available Phosphate-P	4.6			2.0	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Potassium	<20			20	mg/kg	12-AUG-21	12-AUG-21	R5549242
Available Sulfate-S	<3.0			3.0	mg/kg	12-AUG-21	12-AUG-21	R5549251
Saturated Paste Extractables								
SAR	<0.50	SAR:DL		0.50	SAR	13-AUG-21	13-AUG-21	R5550009
Calcium (Ca)	3.1			2.0	mg/kg		14-AUG-21	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch	
L2622738-23 KM 58 - PLOT 3 D75M Sampled By: JR/MK on 23-JUL-21 @ 10:40 Matrix: SOIL Saturated Paste Extractables Calcium (Ca) Chloride (Cl) Chloride (Cl) Conductivity Sat. Paste Magnesium (Mg) Magnesium (Mg) Potassium (K) Potassium (K) % Saturation Sodium (Na) Sodium (Na) Sulfur (as SO4) Sulfur (as SO4) TGR(sodic) TGR(brine)									
		7.9		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009	
		<10		10	mg/L	13-AUG-21	13-AUG-21	R5549854	
		<3.9		3.9	mg/kg		14-AUG-21		
		<0.10		0.10	dS m-1	12-AUG-21	13-AUG-21	R5549936	
		<2.0		2.0	mg/kg		14-AUG-21		
		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009	
		<2.0		2.0	mg/kg		14-AUG-21		
		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009	
		39.1		1.0	%	12-AUG-21	13-AUG-21	R5549936	
		<2.0		2.0	mg/kg		14-AUG-21		
		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009	
		4.0		2.0	mg/kg		14-AUG-21		
		10.3		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009	
		<0.10		0.10	t/ha		14-AUG-21		
		<0.10		0.10	t/ha		14-AUG-21		
	L2622738-24 KM 58 - PLOT 3 D150M Sampled By: JR/MK on 23-JUL-21 @ 11:20 Matrix: SOIL Physical Tests Loss on Ignition @ 375 C Organic Matter pH (1:2 CaCl2) Particle Size % Gravel (>2mm) % Sand (2.00mm - 1.00mm) % Sand (1.00mm - 0.50mm) % Sand (0.50mm - 0.25mm) % Sand (0.25mm - 0.125mm) % Sand (0.125mm - 0.063mm) % Silt (0.063mm - 0.0312mm) % Silt (0.0312mm - 0.004mm) % Clay (<4um) Texture Plant Available Nutrients Available Nitrate-N Available Phosphate-P Available Potassium Available Sulfate-S Saturated Paste Extractables SAR Calcium (Ca) Calcium (Ca)								
			3.8		1.0	%	10-AUG-21	11-AUG-21	R5548257
		3.3		1.0	%	10-AUG-21	11-AUG-21	R5548257	
		4.19		0.10	pH	13-AUG-21	13-AUG-21	R5550037	
		<1.0		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		3.6		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		13.4		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		40.1		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		34.8		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		2.0		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		2.4		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		2.3		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		<1.0		1.0	%	10-AUG-21	11-AUG-21	R5548430	
		Sand				10-AUG-21	11-AUG-21	R5548430	
		<1.0		1.0	mg/kg	11-AUG-21	11-AUG-21	R5548494	
		<2.0		2.0	mg/kg	12-AUG-21	12-AUG-21	R5549242	
		<20		20	mg/kg	12-AUG-21	12-AUG-21	R5549242	
		<3.0		3.0	mg/kg	12-AUG-21	12-AUG-21	R5549251	
		<0.50	SAR:DL	0.50	SAR	13-AUG-21	13-AUG-21	R5550009	
		3.3		2.2	mg/kg		14-AUG-21		
		7.6		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2622738-24	KM 58 - PLOT 3 D150M							
Sampled By:	JR/MK on 23-JUL-21 @ 11:20							
Matrix:	SOIL							
Saturated Paste Extractables								
Chloride (Cl)		<10		10	mg/L	13-AUG-21	13-AUG-21	R5549854
Chloride (Cl)		<4.4		4.4	mg/kg		14-AUG-21	
Conductivity Sat. Paste		<0.10		0.10	dS m-1	12-AUG-21	13-AUG-21	R5549936
Magnesium (Mg)		<2.2		2.2	mg/kg		14-AUG-21	
Magnesium (Mg)		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Potassium (K)		2.6		2.2	mg/kg		14-AUG-21	
Potassium (K)		6.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
% Saturation		43.6		1.0	%	12-AUG-21	13-AUG-21	R5549936
Sodium (Na)		<2.2		2.2	mg/kg		14-AUG-21	
Sodium (Na)		<5.0		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
Sulfur (as SO4)		5.0		2.2	mg/kg		14-AUG-21	
Sulfur (as SO4)		11.6		5.0	mg/L	13-AUG-21	13-AUG-21	R5550009
TGR(sodic)		<0.10		0.10	t/ha		14-AUG-21	
TGR(brine)		<0.10		0.10	t/ha		14-AUG-21	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
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Sample Parameter Qualifier key listed:

Qualifier	Description
SAR:DL	SAR is incalculable due to undetectable Na. Detection Limit represents maximum possible SAR value.
SAR:INC	SAR is incalculable due to Ca, Mg below detection limit.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-PASTE-COL-SK	Soil	Chloride (Cl) (Saturated Paste)	CSSS 15.2.1/ APHA 4500-Cl E
A soil extract is produced by the saturated paste extraction procedure. The extract is analyzed for Chloride by Colourimetry using a discrete analyzer.			
EC-SAR-SK	Soil	EC (Saturated Paste)	CSSS 18.2.2/CSSS 18.3.1
After saturated soil paste equilibrium, an extract is obtained by vacuum filtration with conductivity of the extract measured by a conductivity meter.			
NO3-AVAIL-SK	Soil	Available Nitrate-N	Alberta Ag / APHA 4500 NO3F
Available Nitrate and Nitrite are extracted from the soil using a dilute calcium chloride solution. Nitrate is quantitatively reduced to nitrite by passing of the sample through a copperized cadmium column. The nitrite (reduced nitrate plus original nitrite) is then determined by diazotizing with sulfanilamide followed by coupling with N-(1-naphthyl) ethylenediamine dihydrochloride. The resulting water soluble dye has a magenta color which is measured at colorimetrically at 520nm.			
OM-LOI-SK	Soil	Organic Matter by LOI at 375 deg C.	CSSS (1978) p. 160
The dry-ash method involves the removal of organic matter by combustion at 375 degrees C for a minimum of 16 hours. Samples are dried prior to combustion.			
PH-1:2CACL2-SK	Soil	pH (1:2 Soil:CaCl2 Extraction)	CSSS 2008 16.3
1 part dry soil and 2 parts de-ionized 0.01M CaCl2 (by volume) is mixed. The slurry is allowed to stand with occasional stirring for 30 - 60 minutes. pH of the soil slurry is then measured using a pH meter.			
PO4/K-AVAIL-SK	Soil	Plant Available Phosphorus and Potassium	Comm. Soil Sci. Plant Anal, 25 (5&6)
Plant available phosphorus and potassium are extracted from the soil usng Modified Kelowna solution. Phosphorous in the soil extract is determined colorimetrically at 880 nm, while potassiumis determined by flame emission at 770 nm.			
PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1
Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.			
SAL-MG/KG-CALC-SK	Soil	Detail Salinity in mg/kg	Manual Calculation
SALINITY-INTCHECK-SK	Soil		CSSS 18.4-Calculation
SAR-CALC-SO4-SK	Soil	SAR, Cations and SO4 in saturated soil	APHA 3120B
Ca, Mg, Na, K and SO4 in a saturated soil extract are determined by ICP-OES.			
SAT-PCNT-SK	Soil	Saturated Paste	CSSS Ch. 15
A saturated paste is generated by adding water to soil with mixing until the following criteria are met.: The sample paste glistens as it reflects light. The sample flows slightly when container is tipped, and slides freely and cleanly off the spatula. A trench carved in the soil surface will close readily upon jarring the container. There should be no free layer of water on top of the sample. An aliquot of the sample is obtained, dried at 105C and saturation percentage is determined.			
SO4-AVAIL-SK	Soil	Available Sulfate-S	REC METH SOIL ANAL - AB. AG(1988)
Plant available sulfate in the soil is extracted using a weak calcium chloride solution. Sulfate in the extract is determined by ICP-OES. This extraction may also produce organic sulfur in the extracts when organic soils are analyzed.			
TGR2-CALC-SK	Soil	Theoretical Gypsum Requirement	J. Ashworth et al (1999)

Theoretical Gypsum Requirement is an estimate of the gypsum amendment required to remediate brine-contaminated or sodic soils, and is provided in units of tonnes per hectare (t/ha) for a treatment depth of 15cm. TGR(brine), intended for brine-contaminated soils, is calculated using Method A from "A Comparison of Methods for Gypsum Requirement of Brine-Contaminated Soils", by J. Ashworth (Cdn J. of Soil Science, 1999), available at www.alsglobal.com. TGR(sodic), intended for naturally sodic soils, uses the Oster and Frenkel method (Method B) from the same paper. Reported TGR values are capped at 50 t/ha, considered the maximum practical gypsum amendment. To convert TGR from t/ha to tons/acre, multiply by 0.446.

Reference Information

To determine a TGR value for an alternate treatment depth, multiply by [desired treatment depth (cm) / 15 cm].

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

- mg/kg - milligrams per kilogram based on dry weight of sample
- mg/kg wwwt - milligrams per kilogram based on wet weight of sample
- mg/kg lwt - milligrams per kilogram based on lipid weight of sample
- mg/L - unit of concentration based on volume, parts per million.
- < - Less than.
- D.L. - The reporting limit.
- N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.