Algar Lake (ALG) Soils Dominant Characteristics

Extent (area / percentage)				255 h	a / 0.23%		
Soil Classification				Peaty Orthic Gleysol, and Rego Gleysols			
Parent Materi	ial			Glacio	lacustrine		
Texture (O/A/	B/C horizon)			() / C	;		
Terrain / Pero	ent Slope			Nearly	/ level / 0.05%	to 2.0%	
Surface Ston	iness			S0 (no	on-stony)		
Drainage Clas	ss			Very p	ooor		
Land Use				Borea	l forest		
Wind Erosion	n Risk			Low			
Water Erosio	n Risk			Low			
	ity Rating for F	orestry – Capa	ability				ilable water holding
Class (Limita				capac	ity, soil moistur	e and nutrient limit	tations)
Reclamation Suitability – Surface Soil / Subsurface Soil (Limitations)*				N/A / Poor (texture)			
Sensitivity to	Acidification			Medium			
		Exa	mple Pr	ofile (S	ite #WKH 48)		
Horizon	Depth (cm)	Cold	our		Texture	Structure	Consistence
Of	20-0	-			-	-	-
BCg	0-120	2.5y 4/3 - (o	live brov	vn)	Clay	Massive	Sticky
			Chemi	stry (Si	ite #WKH 48)		
Horizon	Depth (cm)	pH (sat. paste)	EC (d	IS/m)	SAR	% Saturation	Ratings **
Of/Peat	20-0	4.3	0.4	47	0.1	-	-
BCg	0-120	6.2	0.1	14	0.2	-	Good
	These soils:						
Have developed in poorly d				rained I	ow-lying landso	cape positions and	are often saturated
Soil Unit throughout the year;							
Concerns						mineral soil mater	ial;
		e unstable expo			•		
I	Are s	susceptible to ru	utting an	nd compaction due to high moisture levels.			

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Dover (DOV) Soils Dominant Characteristics

Extent (area / percentage)				1,161 ha / 1.05%			
Soil Classification			Orthic and Gleyed Gray Luvisols				
Parent Ma	aterial		Glad	ciolacustrine			
Texture (Organic/A/B/C	horizon)	() /	/ SiL / SiL / C – H	C		
Terrain /	Percent Slope		Nea	rly level to gently	undulating / 2% to 59	%	
Surface S	Stoniness		S0 (non-stony)			
Drainage	Class		Mod	lerately well to im	perfect		
Land Use)		Bore	eal forest			
Wind Ero	Wind Erosion Risk			1			
Water Ere	Water Erosion Risk			1			
	Land Capability Rating for Forestry – Capability Class (Limitations)			Class 2 – (no limitations available)			
	tion Suitability ce Soil (Limitat	Surface Soil / tions)*	Good / Fair (texture)				
Sensitivit	y to Acidificati	on	Low	,			
		Example P	Profile (Site # KH 12)				
Horizon	Depth (cm)	Colour		Texture	Structure	Consistence	
LFH	10-0	-		-	-	-	
Ahe	0-4	2.5Y 5/2 - (grayish brow	n)	Silt Loam	Platy	-	
Ae	4-28	2.5Y 5/4 - (light olive bro	wn)	Silt Loam	Platy	-	
Bt	28-53	2.5Y 6/3 - (light yellowis brown)		Clay	-	-	
ВС	53-120	2.5Y 3/1 - (very dark gra	ay)	Heavy Clay	Massive	-	
		Soil Chem	istrv	(Site # KH 12)	·		

Soil	Chemistry	(Sita #	KH 12\	
JUII	CHEIIIISHV	10116 #	K11 121	

Horizon	Depth (cm)	pH (sat. paste)	EC (dS/m)	SAR	% Saturation	Ratings **
LFH	10-0	-	-	-	-	-
Ahe	0-4	5.3	0.10	0.1	-	Good
Ae	4-28	5.4	0.09	0.2	-	Good
Bt	28-53	5.0	0.08	0.7	-	Good
ВС	53-120	4.6	0.10	1.9	-	Good

Soil	Unit
Cond	erns

Upper and lower subsoils will be very sensitive to rutting and compaction when wet.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Firebag (FIR) Soils Dominant Characteristics

Extent (area	/ percentage)			12 ha /	0.01%			
Soil Classific				Orthic and Eluviated Dystric/Eutric Brunisols				
Parent Material				Glaciof		- ,		
Texture (Org	anic/A/B/C hori	zon)		() / LS	S-S / LS-S / LS	-SCL		
Terrain / Per				` '		ting / 2% to 9%		
Surface Stor	niness			,		exceedingly stor	ny)	
Drainage Cla	ISS			Well to	rapid	·		
Land Use				Boreal	forest			
Wind Erosio	n Risk			High				
Water Erosic	n Risk			Low to	medium			
Land Capability Rating for Forestry – Capability Class (Limitations)						y productive (ava		
	Reclamation Suitability – Surface Soil / Subsurface Soil (Limitations)*			Poor (consistence, texture) / Poor (consistence, texture)				
Sensitivity to	Acidification			Low				
		Exa	ample F	rofile (S	ite #JB 92)			
Horizon	Depth (cm)	Co	lour		Texture	Structure	9	Consistence
Ae	0-18	7.5 YR 6/2 ·	- (pale ç	green)	LS-S	Single Gra	in	Loose
Bm	18-42	7.5YR 4/	6 - (brov	wn)	LS-S	Single Gra	in	Loose
ВС	42-90	10YR 5/4 bro	- (Yellov own)	wish	LS-SCL	Massive		Loose
		So	il Chem	nistry (S	ite #JB 92)			
Horizon	Depth (cm)	pH (sat. paste)	EC (c	dS/m)	SAR	% Saturation		Ratings **
Ae	0-18	-		-	-	-		-
Bm	18-42				-	-		-
BC	42-90	-		-	-	-		-
	These soils: • Have	developed on r	moderat	ely coars	se to coarse te	xtured glaciofluvi	ial soi	l material;

Have unstable exposed due to the low cohesiveness of the sandy soil material;

Soil Unit Concerns

- May have acidic pH in the top 25 cm depth;
- Can be prone to droughtiness; and
- Have been designated Firebag-ST where soils are exceedingly stony (S4).
- This site was taken from the site inspection list to describe the soils series Firebag, and was not lab tested.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Firm

Fort (FRT) Soils Dominant Characteristics

Extent (area / percentage)				75 ha / 0.07%			
Soil Classification				Brunisolic, Orthic and Gleyed Gray Luvisols			
Parent Ma	aterial		Glaciofl	uvial			
Texture (Organic/A/B/	C horizon)	() / SL	./SL/SCL/SCI	<u>L</u>		
Terrain / I	Percent Slop	е	Nearly I	evel to undulatin	g / 2% to 5%		
Surface S	itoniness		S0 (nor	n-stony) to S3 (m	oderately stony)		
Drainage	Class		Imperfe	ct to moderately	well		
Land Use			Boreal	forest			
Wind Ero	Wind Erosion Risk			1			
Water Ero	sion Risk		Low to medium				
	ability Rating	g for Forestry – Capability	Class 4 – Conditionally productive (soil moisture and nutrient limitations)				
Reclamat		y – Surface Soil / tations)*	Fair (pH) / Poor (consistence, texture)				
Sensitivit	y to Acidifica	ation	Low				
		Example F	Profile (S	ite #LP 93)			
Horizon	Depth (cm)	Colour		Texture	Structure	Consistence	
Of	12-0	-		-	-	-	
Ae	0-6	10 YR 5/3 - (brown)		Sandy Loam	Weak	Friable	
Bm	6-33	10 YR 5/8 - (yellowish br	own)	Sandy Loam	Weak	loose	
Rt	33-52	10 YR 5/6 - (vellowish br	own)	Sandy Clay	Strong	Firm	

Soil Chemistry	(Site #LP 93)	
----------------	---------------	--

Horizon	Depth (cm)	pH (sat. paste)	EC (dS/m)	SAR	% Saturation	Ratings **			
Of	12-0	4.6	0.85	<0.1	486	-			
Ae	0-6	3.3	0.17	0.2	40	Good			
Bm	6-33	4.9	0.10	0.2	39	Good			
Bt	33-52	4.6	0.07	0.5	43	Good			
BC	52-120	-	-	-	-	-			

These soils:

33-52

52-120

Soil Unit Concerns

Bt

ВС

Have developed on sandy loam to sandy clay loam textured glaciofluvial materials;

Loam Sandy Clay

Loam

Massive

- Have unstable exposed faces due to the sandy nature of the soil materials; and
- Can be prone to drought.

Notes:

* Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

10 YR 5/6 - (yellowish brown)

10 YR 3/4 - (dark yellowish brown)

** Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Hartley (HLY) Soils Dominant Characteristics

, ,				_				
Extent (area / percentage)				6,674 ha / 6.02%				
Soil Classific	ation			Terri	Terric Fibrisols and Mesisols			
Parent Materi	ial			Fen	peat Organic			
Texture (Orga	anic/A/B/C hori	zon)		Of /	L/SL			
Terrain / Pero	ent Slope			Leve	el to nearly level /	0.05% to 2%		
Surface Ston	iness			S0 (ı	non-stony)			
Drainage Clas	ss			Poor	r to very poor			
Land Use				Bore	al forest			
Wind Erosion	n Risk			Low				
Water Erosio	n Risk			Low				
Class (Limita			ability		s 5 – Non-produc ent limitations)	ctive (surface pea	t, soil moisture and	
Reclamation Suitability – Surface Soil / Subsurface Soil (Limitations)*			Uncl	Unclassified (Organic)				
Sensitivity to	Acidification			Low				
				Profile	e (Site #SN 6)			
Horizon	Depth (cm)	Cold	our		Texture	Structure	Consistence	
Oh	0-65	-			-	-	-	
Ahg	65-95	10 YR 2/1	- (black	()	Loam	-	-	
Bg	95-120	Gley 2 5/1 – gre		ish	Sandy Loam	-	-	
		Sc	oil Chen	nistry	(Site #SN 6)			
Horizon	Depth (cm)	pH (sat. paste)	EC (c	dS/m)	SAR	% Saturation	Ratings **	
Oh	0-65	5.3	0.2	27	0.2	199	-	
Ahg	65-95	5.6	0.3	38	0.2	76	Good	
Bg	95-120	5.6 0		26	0.2	50	Good	
	These soils:							
Soil Unit Concerns	enco	Have developed on organic material found in fens; in some areas mineral soil material is encountered within 160 cm of the ground surface;						

Notes:

Have unstable faces When exposed; and

Have a high wind erosion risk if organic soil material is dry.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Kinosis (KNS) Soils Dominant Characteristics

Extent (area / percentage)	26,477 ha / 23.87%				
Soil Classification	Brunisolic, Orthic and Gleyed Gray Luvisols				
Parent Material	Till				
Texture (Organic/A/B/C horizon)	() / L / SiL / CL / SL				
Terrain / Percent Slope	Level to undulating / 0.5% to 9%				
Surface Stoniness	S0 (non-stony)				
Drainage Class	Imperfect to moderately well				
Land Use	Boreal forest				
Wind Erosion Risk	Low				
Water Erosion Risk	Low to high (>9%)				
Land Capability Rating for Forestry – Capability Class (Limitations)	Class 3 – Low capability (soil moisture and nutrients limitations)				
Reclamation Suitability – Surface Soil / Subsurface Soil (Limitations)*	Fair (pH) / Fair (texture)				
Sensitivity to Acidification	Low				
Example Profile (Site #SL 57)					

	Example Profile (Site #SL 57)									
Horizon	Depth (cm)	Colour	Texture	Structure	Consistence					
Of	8-0	-	-	-	-					
Ah	0-2	10 YR 2/1 - (black)	Loam	Granular	-					
Ae	2-10	10 YR 5/2 - (grayish brown)	Silt Loam	Moderate	-					
Bm	10-25	10 YR 5/1 - (gray)	Silt Loam	Moderate	-					
Bt	25-55	10 YR 5/4 - (yellowish brown)	Clay Loam	Moderate	-					
IIC	55-100	10 YR 4/6 - (dark yellowish brown)	Sand Loam	Massive	-					

Soil Chemistry (Site #SL 57)								
Horizon Depth (cm) pH (sat. paste) EC (dS/m) SAR % Saturation Ratings **								
Of	8-0	-	-	-	-	=		
Ah	0-2	-	-	-	-	Good		
Ae	2-10	-	-	-	-	Good		
Bm	10-25	5.0	0.07	0.2	-	Good		
Bt	25-55	5.0	0.05	0.4	-	Good		
IIC	55-100	5.0	0.07	0.5	-	Good		
Soil Unit Soils are medium to moderately fine textured soils, and can be subject to rutting and compaction if								

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Livock (LVK) Soils Dominant Characteristics

Extent (area / percentage)	635 ha / 0.57%
Soil Classification	Orthic and Gleyed Gray Luvisols
Parent Material	Glaciofluvial
Texture (Organic/A/B/C horizon)	() / SL / SCL / SCL
Terrain / Percent Slope	Nearly level to undulating / 0.5% to 5%
Surface Stoniness	S0 (non stony) to S3 (very stony)
Drainage Class	Imperfect to well
Land Use	Boreal forest
Wind Erosion Risk	Low
Water Erosion Risk	Low
Land Capability Rating for Forestry – Capability Class (Limitations)	Class 3 – Low capability (organic carbon and moisture limitations)
Reclamation Suitability – Surface Soil / Subsurface Soil (Limitations)*	Poor (texture) / Fair (texture)
Sensitivity to Acidification	Low
Example Pr	rofile (Site #WKH 06)

	Example Profile (Site #WKH 06)							
Horizon	Depth (cm)	Colour	Texture	Structure	Consistence			
Of	5-0	-	-	-	-			
Ae 0-5	0-5	2.5 Y 5/2 - (grayish brown)	Sandy	Weak	Friable			
76	0-3	2.0 1 0/2 (glayisii biowii)	Loam					
			Sandy	Weak	Firm			
Bt	5-46	2.5 Y 5/4 - (light olive brown)	Clay					
			Loam					
		<u>-</u>	Sandy	Weak	Friable			
Ck	46-120	2.5Y 4/3 - (olive brown)	Clay					
			Loam					

Soil Chemistry (Site #WKH 06)								
Horizon	Horizon Depth (cm) pH (sat. paste) EC (dS/m) SAR % Saturation Ratings **							
Of	5-0	5.8	0.09	0.1	-	-		
Ae	0-5	5.3	0.11	0.1	-	Good		
Bt	5-46	5.2	0.06	0.2	-	Good		
Ck	46-120	7.3	0.26	0.1	-	Good		
Soil Unit These soils have developed on moderately coarse glaciofluvial materials overlying moderately fine till; may be unstable if the coarser surface soil material is exposed.								

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Mariana (MRN) Soils Dominant Characteristics

Extent (ar	ea / percenta	age)	16,679 ha	a / 15.03%			
Soil Class	sification		Terric Mesisols, Fibrisols and Mesisols				
Parent Ma	aterial		Organic/G	Slaciofluvial			
Texture (Organic/A/B/	C horizon)	() / SiL /	CL / SCL			
Terrain / I	Percent Slop	е	Nearly lev	el to undula	ating / 0% to 2 %		
Surface S	toniness		S0 (non-s	tony)			
Drainage	Class		Poor				
Land Use	!		Boreal for	est			
Wind Ero	sion Risk		Low				
Water Erosion Risk			Low				
	ability Rating	g for Forestry – Capability	Class 5 – Non-productive (surface peat, soil moisture and nutrient limitations)				
	ion Suitabilit ce Soil (Limit	y – Surface Soil / ations)*	Unclassified (Organic)				
Sensitivit	y to Acidifica	ation	Low				
		Example F	Profile (Site	#JB 85)			
Horizon	Depth (cm)	Colour		Texture	Structure	Consistence	
Om	0-50	-		-	-	-	
Ahbg	50-60	10YR 3/2 - (very dark b	rown)	SiL-L	Granular	Friable	
Dta	CO 75	40VD 4/2 /hrauna	١	OI.	Cultan and an Islanda	L:	

	1 - /							
Om	0-50		-	-	-	-		
Ahbg	50-60	10YR 3/2 - (ve	ry dark brown)	SiL-L	Granular	Friable		
Btg	60-75	10YR 4/3	- (brown)	CL	Subangular bloc	ky Firm		
BCg	75-120	2.5YR 4/3 - ((olive brown)	SCL	Massive	Firm		
	Soil Chemistry *** (Site #JB 85)							
1					0/			

	Soil Chemistry *** (Site #JB 85)								
Horizon	Depth (cm)	pH (sat. paste)	EC (dS/m)	SAR	% Saturation	Ratings **			
Om	-	-	-	-	-	-			
BCg	-	-	-	-	-	-			

These soils:

Soil Unit Concerns

- Have developed on poorly drained organic soils;
- Have unstable soil faces if exposed.
- This site information was extracted from the soil site inspection list to describe the soils series Mariana, and was not lab tested.
- Mineral material is encountered within 160 cm of the surface.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

^{***} Soil Series was not sampled

McLelland (MLD) Soils Dominant Characteristics

Extent (area / percentage)					28,306 ha / 25.52%			
Soil Classific	ation			Typic or Mesic Fibrisols, Typic Mesisol				
Parent Mater	ial			Fen peat Organic				
Texture (Organic/A/B/C horizon))			
Terrain / Percent Slope					to nearly level	/ 0.05% to 2%		
Surface Stoniness					on-stony)			
Drainage Class					o very poor			
Land Use				Borea	l forest			
Wind Erosion	n Risk			Low				
Water Erosio	n Risk			Low				
Land Capability Rating for Forestry – Capability Class (Limitations)				Class 5 – Non-productive (surface peat, soil moisture and nutrient limitations)				
Reclamation	Reclamation Suitability – Surface Soil / Subsurface Soil (Limitations)*			Unclassified (Organic)				
	Acidification	•		Low				
		Exa	ample F	rofile (Site #JB 18)			
Horizon	Depth (cm)	Cold	our		Texture	Structure	Consistence	
Of	0-130	-			-	-	-	
Om	130-220	-			-	-	-	
Soil Chemi:				mistry (Site #JB 18)				
						1		
Horizon	Depth (cm)	pH (sat. paste)		dS/m)	SAR	% Saturation	Ratings **	
Horizon Of	Depth (cm) 0-20	рН	EC (c		SAR 0.3	, ,	Ratings ** -	
		pH (sat. paste)	EC (0.2	dS/m)		Saturation		
Of	0-20	pH (sat. paste) 3.6	0.: 0.:	dS/m) 29	0.3	Saturation 1,630		

130-220 These soils:

Soil Unit Concerns

Have developed on organic material found in fens; in some areas mineral soil material is encountered within 220 cm of the ground surface;

Are saturated throughout the year;

- Have unstable faces when exposed; and
- Have a high wind erosion risk if organic soil material is dry.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Mikkwa aa*** (MKWaa) Soils Dominant Characteristics

Extent (area /	percentage)			79 ha	/ 0.07%			
Soil Classific				Humic, Mesic and Fibric Organic Cryosols				
Parent Materi	ial			Organic (frozen)				
Texture (O/A/				()				
Terrain / Pero				Level to nearly level/ 0.05% to 2%				
Surface Ston	•				on-stony)			
Drainage Cla	SS			,	o very poor			
Land Use				Borea	l forest			
Wind Erosion	n Risk			Low				
Water Erosio	n Risk			Low				
Land Capabil	ity Rating for F	orestry – Capa	ability	Class	5 – Non-produc	tive (Surface pe	at, soi	I moisture and
Class (Limita				nutrie	nt limitations)			
Reclamation Suitability – Surface Soil / Subsurface Soil (Limitations)*			Unclassified (Organic)					
Sensitivity to Acidification				Low				
Example Prof			ofile (S	ite #WKH 15)			T	
Horizon	Depth (cm)	Cold	our		Texture	Structure		Consistence
Of	0-20	-			-	-		-
Omz	20-75	-			-	-		Frozen
BCg	75-120	2.5Y 4/2 - (d brov		/ish	SCL	Massive		Firm
		Soil	Chemi	stry (S	ite #WKH 15)			
Horizon	Depth (cm)	pH (sat. paste)	EC (c	IS/m)	SAR	% Saturation		Ratings **
Of/Omz	0-40	4.4	0.4	43	0.1	-		-
Soil Unit Concerns These soils: Occur in organic soil enviro surface; within 1 m of grour Have unstable faces when Are saturated throughout the				d surfac xposed	e;	ermanently froze	en laye	er beneath the

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Mildred (MIL) Soils Dominant Characteristics

Extent (ar	ea / percenta	age)	3,783 ha / 3.41%			
Soil Class	sification		Orthic and Eluviated Dystric / Eutric Brunisols			
Parent Ma	aterial		Glaciofluv	rial		
Texture (0	Organic/A/B/	C horizon)	() / S / S	s/S		
Terrain / F	Percent Slop	e	Nearly lev	el to Undula	ating / 2% to 9%	
Surface S	toniness		S0 (non-s	tony)		
Drainage	Class		Well to ve	ry rapid		
Land Use	1		Boreal for	est		
Wind Ero	sion Risk		Medium			
Water Ero	sion Risk		Low to High (>9%)			
Land Capability Rating for Forestry – Capability Class (Limitations)			Class 4 – Conditionally productive (water holding capacity, soil moisture, structure, and organic carbon limitations)			
	ion Suitabilit ce Soil (Limit	y – Surface Soil / ations)*	Poor (texture) / Poor (texture)			
Sensitivit	y to Acidifica	ntion	Medium			
		Example Pr	Profile (Site #WKH 16)			
Horizon	Depth (cm)	Colour		Texture	Structure	Consistence
Of	10-0			-	-	-
Ae	0-6	10 YR 5/3 - (brown	1)	Sand	Single grain	Loose
Bm	6-14	10 YR 4/2 - (dark grayish	brown)	Sand	Single grain	Loose
BC	14-120	2.5 Y 5/4 - (yellowish b	rown)	Sand	Single grain	Loose

50	11120	2.0 1 0/1 (9011	owion brown)		99.				
	Soil Chemistry (Site #WKH 16)								
Horizon	Depth (cm)	pH (sat. paste)	EC (dS/m)	SAR	% Saturation	Ratings **			
Of	10-0	4.3	0.35	0.1	-	-			
Ae	0-6	6.3	0.27	0.2	-	Good			
Bm	6-14	6.8	0.22	0.2	-	Good			
BC	14-120	6.4	0.11	0.2	-	Good			

T	h	ese	e s	oi	ls:

Soil Unit Concerns

- Have developed on coarse to very coarse glaciofluvial materials;
- Have unstable soil faces if exposed; and
- May have acidic soil pH within 25 cm of soil surface.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Muskeg (MUS) Soils Dominant Characteristics

Extent (are	a / percentage)			4,515	ha / 4.07%						
Soil Classif	ication			Typic Mesisols, Typic Fibrisols							
Parent Mate	erial			Bog peat and bog peat / till							
Texture (Or	ganic/A/B/C hor	izon)		() / ()							
Terrain / Pe	rcent Slope			Level	to nearly level /	0.05% to 2%					
Surface Sto	niness			S0 (no	on-stony)						
Drainage C	lass			Poor t	o very poor						
Land Use				Borea	l forest						
Wind Erosi	on Risk			Low							
Water Eros	ion Risk			Low							
Land Capal Class (Limi	bility Rating for l tations)	Forestry – Capa	ability	Class 5 – Non-productive (surface peat, soil moisture and nutrient limitations)							
	n Suitability – S Soil (Limitation			Uncla	ssified (Organic	:)					
	to Acidification	,		Low							
		Exa	ample F	Profile (Site #JB 45)							
Horizon	Depth (cm)	Colo	ur		Texture	Structure)	Consistence			
Of	0-20	-			-	-		-			
Of	20-40	-			-	-		-			
Om	40-220	-			-	-		-			
		So	il Chen	nistry (S	Site #JB 45)		,				
Horizon	Horizon Depth (cm) pH (sat. paste) EC				SAR	% Saturation		Ratings **			
Of	0-20	3.5	0.	20	0.2	1680		-			

40-2	220
These	soils

20-40

Soil Unit Concerns

Of

Om

Are organic soils developed in sphagnum peat bogs and are saturated throughout the year;

0.1

<0.1

980

574

Good

Good

Can have mineral soil material contact within 160 cm of the ground surface;

0.17

0.25

Have unstable soil faces if exposed; and

3.5

4.1

Have a high wind erosion risk if soil materials are dry.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Very Sticky

Steepbank (STP) Soils Dominant Characteristics

Extent (a	rea / percenta	ige)	6,645 ha	/ 5.99%							
Soil Class	sification		Peaty Orthic and Rego Gleysols and Orthic Luvic Gleysols								
Parent Ma	aterial		Till								
Texture (Organic/A/B/	C horizon)	SL/SL/	SCL							
Terrain / I	Percent Slop	е	Undulatin	g / 0.05% to	5%						
Surface S	Stoniness		Non to ve	ry stony							
Drainage	Class		Poor								
Land Use			Boreal for	est							
Wind Ero	sion Risk		Low								
Water Ero	sion Risk		Low								
	ability Rating	g for Forestry – Capability	Class 5 – nutrient lii		ctive (surface peat, soil	moisture and					
Reclamat		y – Surface Soil / ations)*	N/A / Poor (Carbonate equivalence)								
Sensitivit	y to Acidifica	ition	Low								
		Example	Profile (Site	e #SA 5)							
Horizon	Depth (cm)	Colour		Texture	Structure	Consistence					
Ah	0-10	10YR 2/1 - (black))	Sandy Loam	Platy	-					
Bg	10-40	10 YR 5/4 - (yellowish b	orown)	Sandy Loam	Subangular Blocky	Slightly Sticky					

	Loam
Soil Chemistry (Site	#SA 5)

10 YR 4/4 - (dark yellowish brown)

Horizon	Depth (cm)	pH (sat. paste)	EC (dS/m)	SAR	% Saturation	Ratings **
Ah	0-10	6.2	0.29	0.1	269	Good
Bg	10-40	6.6	0.20	0.2	40	Good
BCg	40-110	6.6	0.20	0.2	40	Good

These soils:

40-110

Soil Unit Concerns

BCg

• Have developed in poorly drained low-lying landscape positions and are saturated throughout the year;

Sandy

Clay

Massive

- Can have between 10 cm and 30 cm of peat overlying mineral soil material;
- Have unstable faces when exposed due to high moisture levels; and
- Are susceptible to rutting and compaction due to high moisture levels.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Surmont (SRT) Soils Dominant Characteristics

Extent (area / percentage)	4,562 ha / 4.11%							
Soil Classification	Orthic and Gleyed Gray Luvisols							
Parent Material	Till and Colluviated Till							
Texture (Organic/A/B/C horizon)	() / SiL / CL / CL							
Terrain / Percent Slope	Undulating / 5% to >45%							
Surface Stoniness	Non to very stony							
Drainage Class	Moderately well to well							
Land Use	Boreal forest							
Wind Erosion Risk	Low							
Water Erosion Risk	Low to High (>9%)							
Land Capability Rating for Forestry – Capability Class (Limitations)	Class 2 – (no limitations available)							
Reclamation Suitability – Surface Soil / Subsurface Soil (Limitations)*	Not rated (surface peat) / Poor (Carbonate equivalence)							
Sensitivity to Acidification	Low							
Example Profile (Site #LP 33)								

Horizon	Depth (cm)	Colour	Texture	Structure	Consistence
LFH	8-0	-	-	-	-
Ae	0-25	10YR 7/1 - (light gray)	Silt Loam	Platy	Friable
Bt	25-45	10YR 3/4 - (dark yellowish brown)	Clay Loam	Subangular Blocky	Firm
ВС	45-100	10YR 4/6 - (dark yellowish brown)	Silty Clay Loam	Massive	Firm
Ck	110+	10YR 4/6 - (dark yellowish brown)	Silty Clay Loam	Massive	Firm

Soil Chemistry *** (Site #LP 33)	trv *** (Site #LP 33)
----------------------------------	-----------------------

		3011	Cilcilistry	(Site #EF 33)		
Horizon	Depth (cm)	pH (sat. paste)	EC (dS/m)	SAR	% Saturation	Ratings **
LFH	18-0	-	-	-	-	-
Ae	0-11	-	-	-	-	-
Bt	11-80	-	-	-	-	-
BC	80-100	-	-	-	-	-

These soils:

Soil Unit Concerns

- Have developed in moderately well drained steep sloped landscape positions with underlying clay;
- Have between 4 cm and 20 cm of LFH overlying mineral soil material;
- Have unstable faces when exposed due to slope steepness.
- This site information was extracted from the Nexen site inspection list to describe the soils series Surmont.

^{*} Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)

^{**} Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

^{***} Soil Series was not sampled

Miscellaneous Landscape Units

Rough Broken (RB) map units - These map units have extremely steep slopes and are associated with river channels. These map units cover about 76 ha or 0.07 percent of the LSA.

Stream Channel (SC) map units - These map units are associated with slow moving stream channels that are composed predominantly of deep and shallow organic soils with slow moving water in the centre of the map unit. These map units cover about 6,242 ha or 5.63 percent of the study area.



TABLE 9B-1a. SOIL QUALITY RESULTS DETAILED SALINITY

Sample	Soil	Sample	Sample	Matrix Sample	Lab	Lab	SAR	TGR	Na	Ca	Mg	K	Soil O	uality Guide	lines***	Saturation
Name	Series	Depth	Date	Number	pН	EC	JAIN	101	ING	Ca	IVIG	IX.	Soil	Salinity	Sodicity	Percentage
Hamo	/ Horizon	Борин	Duto	rtumbo.	ρ	dS/m	mg/L	mg/L	meq/L	meg/L	meg/L	meg/L	Horizon	Rating	Rating	%
WKH01	MLD 0f	0-40	21-Sep-06	4455060921301	6.10	0.32	0.6	<0.1	0.53	1.02	0.49	1.22	Topsoil			
JB18	MLD Of	0-20	19-Oct-05	4455051019012	3.60	0.29	0.3	<0.1	0.10	0.15	0.12	1.32	Topsoil			1630
JB18	MLD Of	20-50	19-Oct-05	4455051019013	4.70	0.17	0.1	<0.1	0.14	1.35	0.56	0.12	Topsoil			815
JB18	MLD Of	50-130	19-Oct-05	4550051019014	5.10	0.22	0.1	<0.1	0.15	1.81	0.71	0.18	Subsoil			806
JB18	MLD Om	130-220	19-Oct-05	4455051019015	5.60	0.19	<0.1	<0.1	0.11	2.07	0.94	<0.03	Subsoil			499
LP68	MLD Of	0-20	23-Oct-05	4455051023221	4.00	0.32	0.1	<0.1	0.11	0.70	0.59	1.44	Topsoil			1280
LP68	MLD Of	20-220	23-Oct-05	4455051023222	4.50	0.29	0.2	<0.1	0.19	1.83	0.96	0.32	Subsoil			413
2. 00	25 0.	20 220	20 00.00			0.20	0.2	10	01.0	1.00	0.00	0.02	00000			
SL22	LVKAe	0-10	22-Sep-06	4455060922001	4.6	0.12	0.2	<0.1	0.12	0.67	0.31	0.18	Topsoil	Good	Good	
SL22	LVK Bt	10-50	22-Sep-06	4455060922002	4.9	0.05	0.5	<0.1	0.14	0.07	0.07	0.05	Subsoil	Good	Good	
SL22	LVK BC	50-100	22-Sep-06	4455060922003	5.0	0.04	0.7	<0.1	0.19	0.07	0.07	0.03	Subsoil	Good	Good	
LP32	LVK LHF	8-0	19-Oct-05	4455051019211	4.20	0.67	0.1	<0.1	0.18	2.08	1.06	3.63	Topsoil			624
LP32 LP32	LVK LHF	0-12	19-Oct-05	4455051019211	4.20	0.07	0.1	<0.1	0.16	1.02	0.49	0.22	Topsoil	Good	Good	42
LP32 LP32	LVK Ae	12-28	19-Oct-05	4455051019212	4.70	0.19	0.2	<0.1	0.16	0.37	0.49	0.22	Subsoil	Good	Good	44
LP32	LVK BC	28-96	19-Oct-05	4455051019214	5.30	0.00	0.4	<0.1	0.21	0.37	0.19	0.05	Subsoil	Good	Good	39
LP32 LP32	LVK Ck	96-120	19-Oct-05	4455051019214	7.30	0.1	0.4	<0.1	0.24	3.08	1.42	0.03	Subsoil	Good	Good	40
LF 32	LVKCK	90-120	19-061-03	4433031019213	7.30	0.44	0.2	<0.1	0.30	3.00	1.42	0.04	Subsoli	Good	Good	40
SA75	LVK LFH	10-0	22-Oct-05	4455051022450	3.60	0.75	0.2	<0.1	0.25	2.43	1.25	3.42	Topsoil			471
SA75	LVK Ahe	0-3	22-Oct-05	4455051022451	4.00	0.22	0.4	<0.1	0.29	0.44	0.46	0.22	Topsoil	Good	Good	52
SA75	LVK Bt	3-40	22-Oct-05	4455051022452	5.00	0.08	0.4	<0.1	0.21	0.27	0.18	0.10	Subsoil	Good	Good	32
SA75	LVK BC	40-80	22-Oct-05	4455051022453	4.80	0.07	0.6	<0.1	0.24	0.18	0.11	0.09	Subsoil	Good	Good	31
SA75	LVK C	80-110	22-Oct-05	4455051022454	5.10	0.08	0.7	<0.1	0.31	0.28	0.11	0.07	Subsoil	Good	Good	42
WKH06	LVK Of	5-0	21-Sep-06	4455060921302	5.80	0.09	0.1	<0.1	0.05	0.67	0.25	0.19	Topsoil			
WKH06	LVK Ae	0-5	21-Sep-06	4455060921303	5.30	0.11	0.1	<0.1	0.09	0.55	0.25	0.15	Topsoil	Good	Good	
WKH06	LVKBt	5-46	21-Sep-06	4455060921304	5.20	0.06	0.2	<0.1	0.10	0.22	0.10	0.07	Subsoil	Good	Good	
WKH06	LVKCk	46-120	21-Sep-06	4455060921305	7.30	0.26	0.1	<0.1	0.13	1.91	0.61	<0.03	Subsoil	Good	Good	
WKH15	MKWaa	0-40	22-Sep-06	4455060922300	4.4	0.43	0.1	<0.1	0.12	1.92	0.64	2.45	Topsoil			
WKH16	MIL Of	10-0	22-Sep-06	4455060922301	4.3	0.35	0.1	<0.1	0.11	1.16	0.56	2.00	Topsoil			
WKH16	MIL Ae	0-6	22-Sep-06	4455060922302	6.3	0.27	0.2	<0.1	0.22	1.78	1.01	0.04	Topsoil	Good	Good	
WKH16	MIL Bm	6-14	22-Sep-06	4455060922303	6.8	0.22	0.2	<0.1	0.21	1.61	0.80	0.03	Subsoil	Good	Good	
WKH16	MIL BC	14-120	22-Sep-06	4455060922304	6.4	0.11	0.2	<0.1	0.20	0.85	0.39	0.04	Subsoil	Good	Good	
LP12	MIL Of	8-0	19-Oct-05	4455051019206	4.20	0.52	<0.1	<0.1	0.09	2.22	0.96	1.82	Topsoil			380
LP12	MIL Ae	0-22	19-Oct-05	4455051019207	4.80	0.06	0.2	<0.1	0.09	0.21	0.09	0.07	Topsoil	Good	Good	32
LP12	MIL Bm	22-42	19-Oct-05	4455051019208	5.60	0.06	0.2	<0.1	0.10	0.32	0.12	0.07	Subsoil	Good	Good	35
LP12	MIL BC	42-82	19-Oct-05	4455051019209	5.80	0.05	0.3	<0.1	0.12	0.19	0.09	0.08	Subsoil	Good	Good	30
LP12	MIL C	82-120	19-Oct-05	4455051019210	5.20	0.08	0.5	<0.1	0.22	0.23	0.13	0.10	Subsoil	Good	Good	34
WKH48	ALG Of	20-0	23-Sep-06	4455060923300	4.3	0.47	0.1	<0.1	0.08	0.61	0.48	3.57	Topsoil			
WKH48	ALG OI	0-120	23-Sep-06	4455060923001	6.2	0.47	0.1	<0.1	0.08	0.68	0.48	0.05	Subsoil	Good	Good	
VVI (110	, inco bog	0 120	20 Gep-00	1-000000320001	0.2	0.14	0.2	~U. I	0.10	0.00	0.04	0.00	Gubauli	5500	5000	

TABLE 9B-1a. SOIL QUALITY RESULTS DETAILED SALINITY

Sample	Soil	Sample	Sample	Matrix Sample	Lab	Lab	SAR	TGR	Na	Ca	Mg	K	Soil O	uality Guide	lines***	Saturation
Name	Series	Depth	Date	Number	pН	EC	07.11		110	- Ju	9		Soil	Salinity	Sodicity	Percentage
	/ Horizon				P***	dS/m	mg/L	mg/L	meg/L	meg/L	meg/L	meg/L	Horizon	Rating	Rating	%
SL57	KNSxc Bm	10-25	23-Sep-06	4455060923004	5.0	0.07	0.2	<0.1	0.12	0.32	0.16	0.06	Subsoil	Good	Good	
SL57	KNSxc Bt	25-55	23-Sep-06	4455060923005	5.0	0.05	0.4	<0.1	0.12	0.12	0.09	0.05	Subsoil	Good	Good	
SL57	KNSxc IIC	55-100	23-Sep-06	4455060923006	5.0	0.07	0.5	<0.1	0.20	0.20	0.11	0.08	Subsoil	Good	Good	
JB8	KNS Of	13-0	18-Oct-05	4455051018001	5.40	1.05	<0.1	<0.1	0.12	10.50	2.65	3.77	Topsoil			385
JB8	KNS Ae	0-14	18-Oct-05	4455051018002	5.10	0.2	0.2	<0.1	0.16	1.46	0.54	0.16	Topsoil	Good	Good	45
JB8	KNS Bt	14-50	18-Oct-05	4455051018003	5.40	0.16	0.2	<0.1	0.17	1.21	0.44	0.13	Subsoil	Good	Good	46
JB8	KNS BC	50-80	18-Oct-05	4455051018004	6.90	0.38	0.2	<0.1	0.26	3.20	1.37	0.07	Subsoil	Good	Good	43
JB8	KNS CK	80-120	18-Oct-05	4455051018005	7.60	0.42	0.2	<0.1	0.31	3.47	1.34	0.06	Subsoil	Good	Good	46
SA53	KNS LFH	8-0	20-Oct-05	4455051020430	4.10	0.87	0.2	<0.1	0.31	2.39	1.38	5.18	Topsoil			609
SA53	KNS Ae	0-20	20-Oct-05	4455051020431	4.90	0.08	0.4	<0.1	0.22	0.36	0.19	0.09	Topsoil	Good	Good	38
SA53	KNS Bt1	20-50	20-Oct-05	4455051020432	4.70	0.08	0.5	<0.1	0.19	0.20	0.14	0.07	Subsoil	Good	Good	44
SA53	KNS Bt2	50-80	20-Oct-05	4455051020433	4.90	0.07	0.7	<0.1	0.25	0.16	0.10	0.05	Subsoil	Good	Good	39
SA53	KNS BC	80-110+	20-Oct-05	4455051020434	5.00	0.09	0.6	<0.1	0.29	0.25	0.14	0.07	Subsoil	Good	Good	30
ID 45	MUO Of	0.00	04 0-4 05	4455054004005	2.5	0.00	0.0	0.4	0.00	0.44	0.08	0.40	T			4000
JB45	MUS Of	0-20	21-Oct-05	4455051021025	3.5 3.5	0.20	0.2	<0.1	0.08	0.14		0.48	Topsoil			1680
JB45 JB45	MUS Of	20-40 40-220	21-Oct-05	4455051021026	3.5 4.1	0.17	0.1	<0.1	0.09 0.09	0.55	0.18	0.08	Subsoil			980 574
JB45	MUS Om	40-220	21-Oct-05	4455051021027	4.1	0.25	<0.1	<0.1	0.09	1.72	0.64	<0.03	Subsoil			5/4
LP38	HRR LFH	5-0	20-Oct-05	4455051020216	6.0	1.75	<0.1	<0.1	0.12	9.87	6.29	8.99	Topsoil			356
LP38	HRR Ae	0-5	20-Oct-05	4455051020217	7.2	0.35	0.1	<0.1	0.20	2.78	1.78	0.05	Topsoil	Good	Good	39
LP38	HRR Bt	5-55	20-Oct-05	4455051020218	5.4	0.19	0.3	<0.1	0.29	1.08	0.80	0.09	Subsoil	Good	Good	42
LP38	HRR BCg	55-73	20-Oct-05	4455051020219	7.2	0.37	0.2	<0.1	0.34	2.81	1.50	0.05	Subsoil	Good	Good	47
LP38	HRR CKg	73-110	20-Oct-05	4455051020220	7.6	0.32	0.2	<0.1	0.28	2.39	1.16	0.07	Subsoil	Good	Good	42
LP93	FORT Of	12-0	24-Oct-05	4455051024236	4.6	0.85	<0.1	<0.1	0.14	4.90	1.80	4.09	Topsoil			486
LP93	FORT Ae	0-6	24-Oct-05	4455051024237	3.7	0.03	0.2	<0.1	0.13	0.32	0.23	0.18	Topsoil	Good	Good	40
LP93	FORT Bm	6-33	24-Oct-05	4455051024238	4.9	0.10	0.2	<0.1	0.12	0.36	0.20	0.20	Subsoil	Good	Good	39
LP93	FORT Bt	33-52	24-Oct-05	4455051024239	4.6	0.07	0.5	<0.1	0.18	0.18	0.09	0.12	Subsoil	Good	Good	43
SN6	HLY Oh	0-65	23-Oct-05	4455051023460	5.3	0.27	0.2	<0.1	0.21	1.96	0.71	0.07	Topsoil			199
SN6	HLY Ahg	65-95	23-Oct-05	4455051023461	5.6	0.38	0.2	<0.1	0.29	2.71	1.17	0.06	Subsoil	Good	Good	76
SN6	HLY Bg	95-120	23-Oct-05	4455051023462	5.6	0.26	0.2	<0.1	0.26	1.55	0.74	0.14	Subsoil	Good	Good	50
Burned Sites																
SA5	STP Ah	0-10	18-Oct-05	4455051018400	6.2	0.29	0.1	<0.1	0.16	2.50	1.33	0.12	Topsoil	Good	Good	269
SA5	STP Bg	10-40	18-Oct-05	4455051018401	6.6	0.20	0.2	<0.1	0.20	1.51	0.78	0.12	Subsoil	Good	Good	40
SA5	STP BCg	40-110+	18-Oct-05	4455051018402	6.6	0.20	0.3	<0.1	0.32	1.06	0.64	0.16	Subsoil	Good	Good	40
SA26	MUS Of	0-20	19-Oct-05	4455051019409	3.50	0.19	0.2	<0.1	0.08	0.15	0.10	0.31	Topsoil			1440
SA26	MUS Of	20-200	19-Oct-05	4455051019410	3.50	0.18	0.2	<0.1	0.12	0.56	0.29	0.11	Subsoil			616
SA26	MUS Bq	200-220	19-Oct-05	4455051019411	4.20	0.3	0.2	<0.1	0.12	1.26	0.23	0.29	Subsoil	Good	Good	49
0.120	55 59	200 220			0	0.0	0.0		0.01	20	3.01	0.20	2 2 2 2 2 2 2 2	5500	2300	

TABLE 9B-1a. SOIL QUALITY RESULTS DETAILED SALINITY

North American Oil Sands Corporation

Sample	Soil	Sample	Sample	Matrix Sample	Lab	Lab	SAR	TGR	Na	Ca	Mg	K	Soil Q	uality Guidel	ines***	Saturation
Name	Series	Depth	Date	Number	pН	EC							Soil	Salinity	Sodicity	Percentage
	/ Horizon					dS/m	mg/L	mg/L	meq/L	meq/L	meq/L	meq/L	Horizon	Rating	Rating	%
Burned Sites																
SA28	KNSzb LFH	5-0	19-Oct-05	4455051019412	3.90	0.3	0.1	<0.1	0.11	1.20	0.83	0.80	Topsoil			432
SA28	KNSzb Ae	0-18	19-Oct-05	4455051019413	4.00	0.13	0.4	<0.1	0.18	0.28	0.22	0.31	Topsoil	Good	Good	27
SA28	KNSzb Bm	18-50	19-Oct-05	4455051019414	5.10	0.07	0.3	<0.1	0.13	0.21	0.10	0.12	Subsoil	Good	Good	26
SA28	KNSzb Bt	50-90	19-Oct-05	4455051019415	4.90	0.09	0.8	<0.1	0.34	0.22	0.14	0.17	Subsoil	Good	Good	32
SA28	KNSzb BC	90-140	19-Oct-05	4455051019416	5.00	0.16	0.8	<0.1	0.49	0.46	0.27	0.19	Subsoil	Good	Good	41
CCME Indust	rial Guidelines	s*			6-8.5**	4	12	NS	NS	NS	NS	NS	NS	NS	NS	NS
Alberta Tier I	criteria**				6-8.5	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

--- - not analyzed

NA - not applicable

NS - not specified

* - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 2006)

** - Alberta Tier I Criteria for Contaminated Soil Assessment and Remediation (AENV, 1994)

Italics - indicates that values exceed specified guideline

*** - Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Good topsoil - EC <2 dS/m; SAR <4

Good subsoil - EC <3 dS/m; SAR <4

Fair topsoil - EC 2 dS/m to 4 dS/m; SAR 4 to 8

Fair subsoil - EC 3 dS/m to 5 dS/m; SAR 4 to 8

Poor topsoil - EC 4 dS/m to 8 dS/m; SAR 8 to 12

Poor subsoil - EC 5 dS/m to 10 dS/m; SAR 8 to 12

Unsuitable topsoil - EC >8 dS/m; SAR >12

Unsuitable subsoil - EC >10 dS/m; SAR >12

TABLE 9B-1a. SOIL QUALITY RESULTS DETAILED SALINITY - mg/kg

										Solub	le lons		Soil Q	uality Guidel	lines***	
Sample Point	Soil Series / Horizon	Depth cm	Sample Date	MSI Sample Number	Lab pH	Lab EC dS/m	SAR	TGR tons/ac	Na mg/kg	Ca mg/kg	Mg mg/kg	K mg/kg	Soil Horizon	Salinity Rating	Sodicity Rating	Saturation Percentage
WKH01	MLD 0f	0-40	21-Sep-06	4455060921301	6.10	0.32	0.6	<0.1	67	111	32.6	258	Topsoil			<u>%</u>
VVICIOI	IVILD OI	0-40	21-3ep-00	4433000921301	0.10	0.32	0.0	<0.1	07	111	32.0	230	Topson			
JB18	MLD Of	0-20	19-Oct-05	4455051019012	3.60	0.29	0.3	<0.1	39	49.0	22.8	842	Topsoil			1630
JB18	MLD Of	20-50	19-Oct-05	4455051019013	4.70	0.17	0.1	<0.1	25	220.0	55.5	38	Topsoil			815
JB18	MLD Of	50-130	19-Oct-05	4550051019014	5.10	0.22	0.1	<0.1	27	292.0	69.0	56	Subsoil			806
JB18	MLD Om	130-220	19-Oct-05	4455051019015	5.60	0.19	<0.1	<0.1	13	206.0	56.5	<5	Subsoil			499
LP68	MLD Of	0-20	23-Oct-05	4455051023221	4.00	0.32	0.1	<0.1	32	178.0	91.8	717	Topsoil			1280
LP68	MLD Of	20-220	23-Oct-05	4455051023222	4.50	0.29	0.2	<0.1	18	151.0	47.7	52	Subsoil			413
SL22	LVKAe	0-10	22-Sep-06	4455060922001	4.60	0.12	0.2	<0.1	2	7.7	2.1	4	Topsoil	Good	Good	
SL22	LVK Bt	10-50	22-Sep-06	4455060922002	4.90	0.05	0.5	<0.1	1	0.5	0.3	<1	Subsoil	Good	Good	
SL22	LVK BC	50-100	22-Sep-06	4455060922003	5.00	0.04	0.7	<0.1	1	0.4	0.2	<1	Subsoil	Good	Good	
LP32	LVK LFH	8-0	19-Oct-05	4455051019211	4.20	0.67	0.1	<0.1	26	260.0	80.0	884	Topsoil			624
LP32	LVK Ae	0-12	19-Oct-05	4455051019212	4.00	0.19	0.2	<0.1	2	8.6	2.5	4	Topsoil	Good	Good	42
LP32	LVK Bt	12-28	19-Oct-05	4455051019213	4.70	0.08	0.4	<0.1	2	3.3	1.0	1	Subsoil	Good	Good	44
LP32	LVK BC	28-96	19-Oct-05	4455051019214	5.30	0.1	0.4	<0.1	2	3.6	1.2	<1	Subsoil	Good	Good	39
LP32	LVK Ck	96-120	19-Oct-05	4455051019215	7.30	0.44	0.2	<0.1	3	24.6	6.9	<1	Subsoil	Good	Good	40
SA75	LVK LFH	10-0	22-Oct-05	4455051022450	3.60	0.75	0.2	<0.1	27	229.0	71.2	629	Topsoil			471
SA75	LVK Ahe	0-3	22-Oct-05	4455051022451	4.00	0.22	0.4	<0.1	4	4.6	2.9	4	Topsoil	Good	Good	52
SA75	LVK Bt	3-40	22-Oct-05	4455051022452	5.00	0.08	0.4	<0.1	2	1.7	0.7	1	Subsoil	Good	Good	32
SA75	LVK BC	40-80	22-Oct-05	4455051022453	4.80	0.07	0.6	<0.1	2	1.1	0.4	1	Subsoil	Good	Good	31
SA75	LVK C	80-110	22-Oct-05	4455051022454	5.10	0.08	0.7	<0.1	3	2.4	0.6	1	Subsoil	Good	Good	42
WKH06	LVK Of	5-0	21-Sep-06	4455060921302	5.80	0.09	0.1	<0.1	9	94.0	21.0	51	Topsoil			
WKH06	LVK Ae	0-5	21-Sep-06	4455060921303	5.30	0.11	0.1	<0.1	1	6.9	1.9	4	Topsoil	Good	Good	
WKH06	LVKBt	5-46	21-Sep-06	4455060921304	5.20	0.06	0.2	<0.1	1	2.0	0.6	1	Subsoil	Good	Good	
WKH06	LVKCk	46-120	21-Sep-06	4455060921305	7.30	0.26	0.1	<0.1	2	20.9	4.1	<1	Subsoil	Good	Good	
WKH15	MKWaa	0-40	22-Sep-06	4455060922300	4.40	0.43	0.1	<0.1	26	355	71.3	884	Topsoil			
WKH16	MIL Of	10-0	22-Sep-06	4455060922301	4.30	0.35	0.1	<0.1	26	234	68.7	788	Topsoil			
WKH16	MIL Ae	0-6	22-Sep-06	4455060922302	6.30	0.27	0.2	<0.1	2	11.3	3.9	<1	Topsoil	Good	Good	
WKH16	MIL Bm	6-14	22-Sep-06	4455060922303	6.80	0.2	0.2	<0.1	2	10.3	3.1	<1	Subsoil	Good	Good	
WKH16	MIL BC	14-120	22-Sep-06	4455060922304	6.40	0.11	0.2	<0.1	1	4.8	1.3	<1	Subsoil	Good	Good	
LP12	MIL Of	8-0	19-Oct-05	4455051019206	4.20	0.52	<0.1	<0.1	8	169.0	44.0	269	Topsoil			380
LP12	MIL Ae	0-22	19-Oct-05	4455051019207	4.80	0.06	0.2	<0.1	1	1.4	0.4	<1	Topsoil	Good	Good	32
LP12	MIL Bm	22-42	19-Oct-05	4455051019208	5.60	0.06	0.2	<0.1	1	2.2	0.5	<1	Subsoil	Good	Good	35
LP12	MIL BC	42-82	19-Oct-05	4455051019209	5.80	0.05	0.3	<0.1	1	1.1	0.3	<1	Subsoil	Good	Good	30
LP12	MIL C	82-120	19-Oct-05	4455051019210	5.20	0.08	0.5	<0.1	2	1.6	0.5	1	Subsoil	Good	Good	34
WKH48	ALG Of	20-0	23-Sep-06	4455060923300	4.30	0.47	0.1	<0.1	16	107	50.8	1220	Topsoil			
WKH48	ALG BCg	0-120	23-Sep-06	4455060923001	6.20	0.14	0.2	<0.1	2	7.3	3.5	1	Subsoil	Good	Good	

TABLE 9B-1a. SOIL QUALITY RESULTS DETAILED SALINITY - mg/kg

	1	I	1							Solub	le lons		Soil Q	uality Guidel	lines***	1
Sample	Soil	Depth	Sample	MSI Sample	Lab pH	Lab EC	SAR	TGR	Na	Ca	Mg	К	Soil	Salinity	Sodicity	Saturation
Point	Series	cm	Date	Number	p	dS/m		tons/ac	mg/kg	mg/kg	mg/kg	mg/kg	Horizon	Rating	Rating	Percentage
SL57	KNSxc Bm	10-25	23-Sep-06	4455060923004	5.00	0.07	0.2	<0.1	1	3.1	1.0	1	Subsoil	Good	Good	
SL57	KNSxc Bt	25-55	23-Sep-06	4455060923005	5.00	0.05	0.4	<0.1	2	1.3	0.6	<1	Subsoil	Good	Good	
SL57	KNSxc IIC	55-100	23-Sep-06	4455060923006	5.00	0.07	0.5	<0.1	2	1.8	0.6	1	Subsoil	Good	Good	
JB8	KNS Of	13-0	18-Oct-05	4455051018001	5.40	1.05	<0.1	<0.1	11	810.0	123.0	566	Topsoil			385
JB8	KNS Ae	0-14	18-Oct-05	4455051018002	5.10	0.2	0.2	<0.1	2	13.2	2.9	3	Topsoil	Good	Good	45
JB8	KNS Bt	14-50	18-Oct-05	4455051018003	5.40	0.16	0.2	<0.1	2	11.2	2.4	2	Subsoil	Good	Good	46
JB8	KNS BC	50-80	18-Oct-05	4455051018004	6.90	0.38	0.2	<0.1	2	27.8	7.2	1	Subsoil	Good	Good	43
JB8	KNS CK	80-120	18-Oct-05	4455051018005	7.60	0.42	0.2	<0.1	3	32.2	7.5	1	Subsoil	Good	Good	46
SA53	KNS LFH	8-0	20-Oct-05	4455051020430	4.10	0.87	0.2	<0.1	44	291.0	102.0	1230	Topsoil			609
SA53	KNS Ae	0-20	20-Oct-05	4455051020431	4.90	0.08	0.4	<0.1	2	2.8	0.9	1	Topsoil	Good	Good	38
SA53	KNS Bt1	20-50	20-Oct-05	4455051020432	4.70	0.08	0.5	<0.1	2	1.7	0.7	1	Subsoil	Good	Good	44
SA53	KNS Bt2	50-80	20-Oct-05	4455051020433	4.90	0.07	0.7	<0.1	2	1.2	0.5	<1	Subsoil	Good	Good	39
SA53	KNS BC	80-110+	20-Oct-05	4455051020434	5.00	0.09	0.6	<0.1	2	1.5	0.5	<1	Subsoil	Good	Good	30
JB45	MUS Of	0-20	21-Oct-05	4455051021025	3.50	0.2	0.2	<0.1	29	45.8	16.8	318	Topsoil			1680
JB45	MUS Of	20-40	21-Oct-05	4455051021026	3.50	0.17	0.1	<0.1	20	107.0	22.0	31	Subsoil			980
JB45	MUS Om	40-220	21-Oct-05	4455051021027	4.10	0.25	<0.1	<0.1	12	198.0	44.8	6	Subsoil			574
LP38	HRR LFH	5-0	20-Oct-05	4455051020216	6.00	1.75	<0.1	<0.1	10	702.0	270.0	1250	Topsoil			356
LP38	HRR Ae	0-5	20-Oct-05	4455051020217	7.20	0.35	0.1	<0.1	2	21.8	8.5	<1	Topsoil	Good	Good	39
LP38	HRR Bt	5-55	20-Oct-05	4455051020218	5.40	0.19	0.3	<0.1	3	9.2	4.1	2	Subsoil	Good	Good	42
LP38	HRR BCg	55-73	20-Oct-05	4455051020219	7.20	0.37	0.2	<0.1	4	26.7	8.6	<1	Subsoil	Good	Good	47
LP38	HRR CKg	73-110	20-Oct-05	4455051020220	7.60	0.32	0.2	<0.1	3	20.1	5.9	1	Subsoil	Good	Good	42
LP93	FORT Of	12-0	24-Oct-05	4455051024236	4.60	0.85	<0.1	<0.1	15	476.0	106.0	774	Topsoil			486
LP93	FORT Ae	0-6	24-Oct-05	4455051024237	3.70	0.17	0.2	<0.1	1	2.6	1.1	3	Topsoil	Good	Good	40
LP93	FORT Bm	6-33	24-Oct-05	4455051024238	4.90	0.1	0.2	<0.1	1	2.8	1.0	3	Subsoil	Good	Good	39
LP93	FORT Bt	33-52	24-Oct-05	4455051024239	4.60	0.07	0.5	<0.1	2	1.6	0.4	2	Subsoil	Good	Good	43
SN6	HLY Oh	0-65	23-Oct-05	4455051023460	5.30	0.27	0.2	<0.1	10	78.0	17.0	5	Topsoil			199
SN6	HLY Ahg	65-95	23-Oct-05	4455051023461	5.60	0.38	0.2	<0.1	5	41.0	10.7	2	Subsoil	Good	Good	76
SN6	HLY Bg	95-120	23-Oct-05	4455051023462	5.60	0.26	0.2	<0.1	3	15.6	4.5	3	Subsoil	Good	Good	50
Burned Sites	l															
SA5	STP Ah	0-10	18-Oct-05	4455051018400	6.20	0.29	0.1	<0.1	10	135.0	43.3	13	Topsoil	Good	Good	269
SA5	STP Bg	10-40	18-Oct-05	4455051018401	6.60	0.2	0.2	<0.1	2	12.2	3.8	2	Subsoil	Good	Good	40
SA5	STP BCg	40-110+	18-Oct-05	4455051018402	6.60	0.2	0.3	<0.1	3	8.6	3.1	2	Subsoil	Good	Good	40
1																

TABLE 9B-1a. SOIL QUALITY RESULTS DETAILED SALINITY - mg/kg

North American Oil Sands Corporation

										Solub	le lons		Soil Q	uality Guidel	ines***	
Sample	Soil	Depth	Sample	MSI Sample	Lab pH	Lab EC	SAR	TGR	Na	Ca	Mg	K	Soil	Salinity	Sodicity	Saturation
Point	Series	cm	Date	Number		dS/m		tons/ac	mg/kg	mg/kg	mg/kg	mg/kg	Horizon	Rating	Rating	Percentage
Burned Sites																
SA26	MUS Of	0-20	19-Oct-05	4455051019409	3.50	0.19	0.2	<0.1	25	43.1	17.2	175	Topsoil			1440
SA26	MUS Of	20-200	19-Oct-05	4455051019410	3.50	0.18	0.2	<0.1	17	68.6	21.4	26	Subsoil			616
SA26	MUS Bg	200-220	19-Oct-05	4455051019411	4.20	0.3	0.3	<0.1	3	12.4	5.4	6	Subsoil	Good	Good	49
SA28	KNSzb LFH	5-0	19-Oct-05	4455051019412	3.90	0.3	0.1	<0.1	11	103.0	43.4	134	Topsoil			432
SA28	KNSzb Ae	0-18	19-Oct-05	4455051019413	4.00	0.13	0.4	<0.1	1	1.5	0.7	3	Topsoil	Good	Good	27
SA28	KNSzb Bm	18-50	19-Oct-05	4455051019414	5.10	0.07	0.3	<0.1	1	1.1	0.3	1	Subsoil	Good	Good	26
SA28	KNSzb Bt	50-90	19-Oct-05	4455051019415	4.90	0.09	0.8	<0.1	2	1.5	0.5	2	Subsoil	Good	Good	32
SA28	KNSzb BC	90-140	19-Oct-05	4455051019416	5.00	0.16	0.8	<0.1	5	3.8	1.4	3	Subsoil	Good	Good	41
CCME Indust	rial Guidelines	S*			6-8.5**	4	12	NS	NS	NS	NS	NS	-	-	-	NS
Alberta Tier I	criteria**				6-8.5	NA	NA	NS	NS	NS	NS	NS	-	-	-	NS

Notes:

--- - not analyzed

NA - not applicable

NS - not specified

* - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 2006)

** - Alberta Tier I Criteria for Contaminated Soil Assessment and Remediation (AENV, 1994)

Italics - indicates that values exceed specified guideline

*** - Salt Contamination Assessment and Remediation Guidelines (AENV, 2001)

Good topsoil - EC <2 dS/m; SAR <4

Fair topsoil - EC 2 to 4 dS/m; SAR 4 to 8

Poor topsoil - EC 4 to 8 dS/m; SAR 8 to 12

Unsuitable topsoil - EC >8 dS/m; SAR >12

Good subsoil - EC <3 dS/m; SAR <4

Fair subsoil - EC 3 to 5 dS/m; SAR 4 to 8

Poor subsoil - EC 5 to 10 dS/m; SAR 8 to 12

Unsuitable subsoil - EC >10 dS/m; SAR >12

TABLE 9B-1a. SOIL QUALITY RESULTS PARTICLE SIZE DISTRIBUTION AND INDICATOR PARAMETERS

	Soil	Sample	Sample	Matrix	CEC	TEC	ESP	OM	TKN	TOC		Texture		Classification
Name	Series / Horizon	Depth	Date	Sample Number	meq/100g	meq/100g	%	%	%	%	% Sand	% Silt	% Clay	(CSSC)
WKH01	MLD Of	0-40	21-Sep-06	4455060921301	71.6	58	0.78	75	1.43	37.5				
JB18	MLD Of	0-20	19-Oct-05	4455051019012	140	10	0.20	88.4	0.55	44.2				
LP68	MLD Of	0-20	23-Oct-05	4455051023221	76.4	26	0.40	87.2	0.80	43.6				
SL22	LVKAe	0-10	22-Sep-06	4455060922001	3.33	<2	<2	1	0.03	0.70	61.4	34.2	4.4	Sandy Loam
SL22	LVK Bt	10-50	22-Sep-06	4455060922002	12.6	6	< 0.4	<1	0.02	0.24	44.4	36.6	19.0	Loam
SL22	LVK BC	50-100	22-Sep-06	4455060922003	7.87	4	<0.7	<1	0.03	0.15	70.0	18.0	12.0	Sandy Loam
LP32	LVK LFH	8-0	19-Oct-05	4455051019211	54.2	21	<0.5	66.1	0.71	33.0				
LP32	LVK Ae	0-12	19-Oct-05	4455051019212	7.3	<2	< 0.7	1.5	0.05	0.8	53.6	5.6	40.8	Sandy Loam
LP32	LVK Bt	12-28	19-Oct-05	4455051019213	13.7	9	0.50	0.48	0.02	0.2	52.6	26.0	21.4	Sandy Clay Loam
LP32	LVK BC	28-96	19-Oct-05	4455051019214							55.6	24.0	20.4	Sandy Clay Loam
LP32	LVK Ck	96-120	19-Oct-05	4455051019215							53.6	22.6	23.8	Sandy Clay Loam
SA75	LVK LFH	10-0	22-Oct-05	4455051022450	114	17	0.30	71.8	0.96	35.9				
SA75	LVK Ahe	0-3	22-Oct-05	4455051022451	13.8	<2	<0.4	3.94	0.09	2.0	22.6	15.6	61.8	Silt Loam
SA75	LVK Bt	3-40	22-Oct-05	4455051022452	0.38	<2	<10	0.42	0.05	0.2	22.6	13.6	63.8	Silt Loam
SA75	LVK BC	40-80	22-Oct-05	4455051022453							56.6	18.6	24.8	Sandy Loam
SA75	LVK C	80-110	22-Oct-05	4455051022454							51.6	25.6	22.8	Sandy Clay Loam
WKH06	LVK Of	5-0	21-Sep-06	4455060921302	69	49	<0.4	86	0.69	42.8				
WKH06	LVK Ae	0-5	21-Sep-06	4455060921303	10.8	5	<0.5	4	0.10	1.85	55.4	36.6	8.0	Sandy Loam
WKH06	LVKBt	5-46	21-Sep-06	4455060921304	18.3	10	<0.3	1	0.05	0.64	47.4	27.6	25.0	Sandy Clay Loam
WKH06	LVKCk	46-120	21-Sep-06	4455060921305	14	26	<0.4	1	0.04	0.62	49.4	27.0	23.6	Sandy Clay Loam
WKH15	MKWaa Of	40-0	22-Sep-06	4455060922300	83.9	43	<0.3	84	0.59	42				
WKH16	MIL Of	10-0	22-Sep-06	4455060922301	74.2	25	<0.4	86	0.45	42.8				
WKH16	MIL Ae	0-6	22-Sep-06	4455060922302	8.85	7	<0.6	2	0.04	0.87	73.4	19.6	7.0	Sandy Loam
WKH16	MIL Bm	6-14	22-Sep-06	4455060922303	6.25	6	<0.8	<1	0.02	0.49	74.8	18.2	7.0	Sandy Loam
WKH16	MIL BC	14-120	22-Sep-06	4455060922304	8.42	7	<0.6	<1	0.03	0.20	69.4	17.0	13.6	Sandy Loam
LP12	MIL Of	8-0	19-Oct-05	4455051019206	61.2	10	<0.4	70.4	0.60	35.2				
LP12	MIL Ae	0-22	19-Oct-05	4455051019207	2.87	<2	<2	< 0.2	0.01	0.1	93.6	2.6	3.8	Sand
LP12	MIL Bm	22-42	19-Oct-05	4455051019208							91.6	5.6	2.8	Sand
LP12	MIL BC	42-82	19-Oct-05	4455051019209							89.6	6.6	3.8	Sand
LP12	MIL C	82-120	19-Oct-05	4455051019210							80.6	11.6	7.8	Sandy Loam
WKH48	ALG Of	20-0	23-Sep-06	4455060923300	90.1	24	<0.3	88	0.88	43.9				
WKH48	ALG BCg	0-120	23-Sep-06	4455060923001	16.6	15	<0.3	2	0.06	0.78	20.4	53.2	26.4	Silt Loam
SL57	KNSxc Bm	10-25	23-Sep-06	4455060923004	11.7	3	<0.4	1	0.05	0.63	18.0	61.6	20.4	Silt Loam
SL57	KNSxc Bt	25-55	23-Sep-06	4455060923005	18.9	7	<0.3	<1	0.04	0.48	25.4	45.6	29.0	Clay Loam
SL57	KNSxc IIC	55-100	23-Sep-06	4455060923006	15.6	6	0.40	<1	0.07	0.42	57.4	25.0	17.6	Sandy Loam

TABLE 9B-1a. SOIL QUALITY RESULTS PARTICLE SIZE DISTRIBUTION AND INDICATOR PARAMETERS

S Of S Ae S Bt S BC	13-0 0-14 14-50 50-80	18-Oct-05 18-Oct-05 18-Oct-05	4455051018001 4455051018002 4455051018003	meq/100g 111 8.61	meq/100g 81	% <0.2	%	%	%	% Sand	% Silt	% Clay	(CSSC)
S Of S Ae S Bt S BC	0-14 14-50 50-80	18-Oct-05 18-Oct-05	4455051018002		81	.0.0							
S Ae S Bt S BC	0-14 14-50 50-80	18-Oct-05 18-Oct-05	4455051018002		81	.0.0							
S Bt S BC	14-50 50-80	18-Oct-05		8.61			52	1.26	26.0				
SBC	50-80		4455051018003	0.0.	4	<0.6	1.6	0.05	0.8	57.6	9.6	32.8	Sandy Loam
_		40.0-4.05	770001010000							50.0	29.6	20.4	Sandy Clay Loam
SCK	00 100	18-Oct-05	4455051018004							51.6	25.6	22.8	Sandy Clay Loam
	80-120	18-Oct-05	4455051018005							49.6	26.6	23.8	Sandy Clay Loam
SLFH	8-0	20-Oct-05	4455051020430	372	28	0.10	88	0.64	44.0				
S Ae	0-20	20-Oct-05	4455051020431	29.1	<2	<0.2	0.49	0.03	0.2	32.6	14.6	52.8	Silt Loam
S Bt1	20-50	20-Oct-05	4455051020432							31.6	30.4	38	Clay Loam
S Bt2	50-80	20-Oct-05	4455051020433							46.0	21.4	32.6	Loam
S BC 8	80-110+	20-Oct-05	4455051020434							59.0	16.8	24.2	Sandy Loam
S Of	0-20	21-Oct-05	4455051021025	154	8	0.20	88.4	0.46	44.2				
R LFH	5-0	20-Oct-05	4455051020216	82	64	<0.3	48.1	0.93	24.0				
R Ae	0-5	20-Oct-05	4455051020217	10.7	9	0.99	1	0.05	0.5	21.6	15.6	62.8	Silt Loam
R Bt	5-55	20-Oct-05	4455051020218	21.3	14	0.42	0.72	0.03	0.4	25.2	30.0	44.8	Clay Loam
R BCg	55-73	20-Oct-05	4455051020219							35.6	21.6	42.8	Loam
R CKg	73-110	20-Oct-05	4455051020220							35.6	16.0	48.4	Loam
RT Of	12-0	24-Oct-05	4455051024236	78.8	36	0.72	73.6	1.16	36.8				
RT Ae	0-6	24-Oct-05	4455051024237	6.99	<2	< 0.7	1.2	0.04	0.6	62.0	5.2	32.8	Sandy Loam
T Bm	6-33	24-Oct-05	4455051024238	15	<2	< 0.3	1.2	0.05	0.6	56.6	17.6	25.8	Sandy Loam
RT Bt	33-52	24-Oct-05	4455051024239							53.2	22.0	24.8	Sandy Clay Loam
Y Oh	0-65	23-Oct-05	4455051023460	341	37	<0.08	33.8	1.34	16.9				
/ Ahg	65-95	23-Oct-05	4455051023461							38.7	20.0	41.3	Loam
	95-120	23-Oct-05	4455051023462							54.6	16.6	28.8	Sandy Loam
SISISIS RERECTORY OF A CONTROL	LFH Ae Bt1 Bt2 BC Of LFH Ae Bt3Cg CKg TOf Ae Bm TBt Oh	LFH 8-0 Ae 0-20 Bt1 20-50 Bt2 50-80 BC 80-110+ Of 0-20 LFH 5-0 Ae 0-5 Bt 5-55 BCG 55-73 CKG 73-110 C Of 12-0 C Ae 0-6 Bm 6-33 C Bt 33-52 Oh 0-65 Ahg 65-95	LFH	LFH 5-0 20-Oct-05 4455051020430 Ae 0-5 20-Oct-05 4455051020431 Bt 5-55 20-Oct-05 4455051020218 BC 73-110 20-Oct-05 4455051020219 CKg 73-110 20-Oct-05 4455051020220 CT Of 12-0 24-Oct-05 4455051024236 CT Ae 0-6 24-Oct-05 4455051024237 CT Of 12-0 24-Oct-05 4455051024237 CT Of 12-0 24-Oct-05 4455051024237 CT Of 12-0 24-Oct-05 4455051024238 CT Of 12-0 24-Oct-05 4455051024239	LFH 8-0 20-Oct-05 4455051020430 372 Ae 0-20 20-Oct-05 4455051020431 29.1 Bt1 20-50 20-Oct-05 4455051020432 Bt2 50-80 20-Oct-05 4455051020433 BC 80-110+ 20-Oct-05 4455051020434 Of 0-20 21-Oct-05 4455051020216 82 Ae 0-5 20-Oct-05 4455051020217 10.7 Bt 5-55 20-Oct-05 4455051020218 21.3 BCg 55-73 20-Oct-05 4455051020219 CKg 73-110 20-Oct-05 4455051020220 Of 12-0 24-Oct-05 4455051020220 Of 12-0 24-Oct-05 4455051020220 T Of 12-0 24-Oct-05 4455051024236 78.8 Bm 6-33 24-Oct-05 4455051024237 6.99 Bm 6-33 24-Oct-05 4455051024238 15 Bt 33-52 24-Oct-05 4455051024239 Oh 0-65 23-Oct-05 4455051023460 341 Ahg 65-95 23-Oct-05 4455051023460 341	Ae 0-5 20-Oct-05 4455051020430 372 28 BLFH 5-0 20-Oct-05 4455051020431 Bt 5-55 20-Oct-05 4455051020217 10.7 9 Bt 5-55 20-Oct-05 4455051020218 21.3 14 BCG 73-110 20-Oct-05 4455051020219 CKg 73-110 20-Oct-05 4455051020220 COf 12-0 24-Oct-05 4455051020220 COf 12-0 24-Oct-05 4455051020210 CMB 6-33 24-Oct-05 4455051020238 15 <2 Bm 6-33 24-Oct-05 4455051024238 15 <2 Bm 6-33 24-Oct-05 4455051024239 COh 0-65 23-Oct-05 4455051024236 341 37 Ahg 65-95 23-Oct-05 4455051023460 341 37 Ahg 65-95 23-Oct-05 4455051023461	LFH 8-0 20-Oct-05 4455051020430 372 28 0.10 Ae 0-20 20-Oct-05 4455051020431 29.1 <2 <0.2 Bt1 20-50 20-Oct-05 4455051020432 Bt2 50-80 20-Oct-05 4455051020433 BC 80-110+ 20-Oct-05 4455051020434 Of 0-20 21-Oct-05 4455051020434 CFH 5-0 20-Oct-05 4455051020216 82 64 <0.3 Ae 0-5 20-Oct-05 4455051020217 10.7 9 0.99 Bt 5-55 20-Oct-05 4455051020218 21.3 14 0.42 BCG 73-110 20-Oct-05 4455051020219 CKG 73-110 20-Oct-05 4455051020220 COf 12-0 24-Oct-05 4455051020220 TOf 12-0 24-Oct-05 4455051020220 Bm 6-33 24-Oct-05 4455051024236 78.8 36 0.72 CKG 73-15 20-Oct-05 4455051024237 6.99 <2 <0.7 Bm 6-33 24-Oct-05 4455051024238 15 <2 <0.3 CKG 73-55 23-Oct-05 4455051024238 15 <2 <0.3 CKG 73-55 23-Oct-05 4455051024239 Oh 0-65 23-Oct-05 4455051024239 Oh 0-65 23-Oct-05 4455051023460 341 37 <0.08 CKG 23-Oct-05 4455051023461	LFH 8-0 20-Oct-05 4455051020430 372 28 0.10 88 Ae 0-20 20-Oct-05 4455051020431 29.1 <2 <0.2 0.49 Bt1 20-50 20-Oct-05 4455051020432 Bt2 50-80 20-Oct-05 4455051020433 BC 80-110+ 20-Oct-05 4455051020434 Of 0-20 21-Oct-05 4455051021025 154 8 0.20 88.4 LFH 5-0 20-Oct-05 4455051020216 82 64 <0.3 48.1 Ae 0-5 20-Oct-05 4455051020217 10.7 9 0.99 1 Bt 5-55 20-Oct-05 4455051020218 21.3 14 0.42 0.72 BCKg 73-110 20-Oct-05 4455051020220 Of 12-0 24-Oct-05 4455051020220 TOf 12-0 24-Oct-05 4455051020220 TOf 12-0 24-Oct-05 4455051020220 TOR 12-0 24-Oct-05 4455051020220 TOR 13-5 20-Oct-05 4455051020220 TOR 12-0 24-Oct-05 4455051024236 78.8 36 0.72 73.6 TAR 0-6 24-Oct-05 4455051024237 6.99 <2 <0.7 1.2 Bm 6-33 24-Oct-05 4455051024238 15 <2 <0.3 1.2 TBT 33-52 24-Oct-05 4455051024239 Oh 0-65 23-Oct-05 4455051024239 Oh 0-65 23-Oct-05 4455051023460 341 37 <0.08 33.8 Ahg 65-95 23-Oct-05 4455051023461	LFH 8-0 20-Oct-05 4455051020430 372 28 0.10 88 0.64 Ae 0-20 20-Oct-05 4455051020431 29.1 <2 <0.2 0.49 0.03 Bt1 20-50 20-Oct-05 4455051020432 Bt2 50-80 20-Oct-05 4455051020433 BC 80-110+ 20-Oct-05 4455051020434 Of 0-20 21-Oct-05 4455051021025 154 8 0.20 88.4 0.46 LFH 5-0 20-Oct-05 4455051020216 82 64 <0.3 48.1 0.93 Ae 0-5 20-Oct-05 4455051020217 10.7 9 0.99 1 0.05 Bt 5-55 20-Oct-05 4455051020218 21.3 14 0.42 0.72 0.03 BCG 73-110 20-Oct-05 4455051020219 CKg 73-110 20-Oct-05 4455051020220 TOf 12-0 24-Oct-05 4455051024236 78.8 36 0.72 73.6 1.16 Ae 0-6 24-Oct-05 4455051024237 6.99 <2 <0.7 1.2 0.04 Bm 6-33 24-Oct-05 4455051024238 15 <2 <0.3 1.2 0.05 FBt 33-52 24-Oct-05 4455051024239 Ch 0-65 23-Oct-05 4455051023460 341 37 <0.08 33.8 1.34 Ang 65-95 23-Oct-05 4455051023461	LFH 8-0	LFH 8-0 20-Oct-05 4455051020430 372 28 0.10 88 0.64 44.0 Ae 0-20 20-Oct-05 4455051020431 29.1 <2 <0.2 0.49 0.03 0.2 32.6 Bt1 20-50 20-Oct-05 4455051020432	FH 8-0 20-Oct-05 4455051020430 372 28 0.10 88 0.64 44.0 A6.0 0.20 20-Oct-05 4455051020431 29.1 <2 <0.2 0.49 0.03 0.2 32.6 14.6 14.6 14.0 14.5 14.5 14.5 14.5 14.5 14.5 14.5 14.5	FH 8-0 20-Oct-05 4455051020430 372 28 0.10 88 0.64 44.0

TABLE 9B-1a. SOIL QUALITY RESULTS

PARTICLE SIZE DISTRIBUTION AND INDICATOR PARAMETERS

North American Oil Sands Corporation

Site	Soil	Sample	Sample	Matrix	CEC	TEC	ESP	OM	TKN	TOC		Texture		Classification
Name	Series	Depth	Date	Sample Number	meq/100g	meq/100g	%	%	%	%	% Sand	% Silt	% Clay	(CSSC)
	/ Horizon													
Burned Sites														
SA5	STP Ah	0-10	18-Oct-05	4455051018400	149	122	<0.2	30.8	1.00	15.4	59.2	4.0	36.8	Sandy Loam
SA5	STP Bg	10-40	18-Oct-05	4455051018401	13.7	12	0.99	1.2	0.05	0.6	59.6	18.0	22.4	Sandy Loam
SA5	STP BCg	40-110+	18-Oct-05	4455051018402							43.6	32.6	23.8	Clay Loam
SA26	MUS Of	0-20	19-Oct-05	4455051019409	377	8	0.08	86.9	0.48	43.4				
SA26	MUS Of	200-220	19-Oct-05	4455051019411							29.6	23.0	47.4	Loam
SA28	KNSzb LFH	5-0	19-Oct-05	4455051019412	443	10	0.06	38.4	0.60	19.2				
SA28	KNSzb Ae	0-18	19-Oct-05	4455051019413	16.9	<2	< 0.3	0.63	0.02	0.3	84.6	3.0	12.4	Loamy Sand
SA28	KNSzb Bm	18-50	19-Oct-05	4455051019414							81.6	6.0	12.4	Loamy Sand
SA28	KNSzb Bt	50-90	19-Oct-05	4455051019415							59.6	20.0	20.4	Sandy Clay Loam
SA28	KNSzb BC	90-140	19-Oct-05	4455051019416							57.6	19.0	23.4	Sandy Loam
Laboratory de	 etection limit			l	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCME Agricul	ltural Guidelir	nes*			NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCME Resident	ial/Parkland Gu	iidelines*			NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCME Commo	ercial Guidelin	nes*			NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCME Industr	ial Guidelines	*		•	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

NS - not specified

* - Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 2006)

Italics - indicates that values exceed CCME guidelines

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position		Slope .ength	Aspect	Drainage	Surface Stoniness	Land Use	Comments
1	JB01	N	N	469504	6184762	FORT	GLFL	5			Ae	0-10	VF-SL	Bt	10-40	VF-SCL	BC1 BC2	40-90 90-120	SCL SL-LS				3-4	U	М	4	3	SW	w	S0	w	v.f sand> increasing coarseness with depth at 95 cm pine, lab tea, aspen
2	JB02	N	N	469612	6184306	HLY	O/GLFL		Oh Om	0-40 40-105				Bg	105-120	LS								L	Е	2			VP	S0	М	black spruce, lab tea, tamarack, blueberry, fireweed, sphagnum, sedge grass
3	JB03	N	N	49335	6184152	MUS	0		Om	0-200														h	L	2			VP	S0	М	tamarack, grass, willow, (big open area by creek)
4	JB04	N	N	469589	6184090	MIL	GLFL	4			Ae	0-8	LS	Bm	8-50	LS	ВС	50-83	LS-S	С	83-120	LS-S	3 topo to west 4-5 to west	R - U	U	4	3	SW	R -VR	S0	W	-decreasing fine content with depth, J.pine, wt. spruce, rein lichen
5	JB05	N	N	470238	6184322	MIL	GLFL	6			Ae	0-16	LS	Bm	16-52	LS	BC1 BC2	52-95 95	LS-S LS-S				5	R - U	М	5	3	W	R	S0	W	dominated by jack pine, some wt spruce, lichen
6	JB06	N	N	470084	6184543	MKWaa	0		Of Om Omz	0-50 50-120 120+													3	U	L	3	3	NW	VP	S0	W	black spruce and tamarack; frozen at 120 cm, lab tea
7	JB07	N	N	469946	6184899	FORTgr	GLFL	6			Ae	0-13	LS	Bm grBt	13-28 28-51	SL-SCL SCL	grBCg	51-87	grSCL	grCk	87-120	SCL	3-4	U	М	4	3	SE	MW - I	S0	W	black spruce and jack pine, labrador tea, bog cranberry, sphagnum
8	JB08	Υ	Y	469695	6185299	KNS	TILL		Of	13-0	Ae	0-14	SL	Bt	14-50	SCL	ВС	50-80	SCL	СК	80-120	SCL	3-4	U	С	4	3		MW	S1	W	till indicators in BC - c/f base of AeJack Pine/Aspen Forested, bl wt spruce,
9	JB09	N	N	469324	6186000	MRN	O TILL		Of Om	0-110 110-130				Bg	130+	CL							1-2	L	L	2	4		Р	S0	W	poor black spruce bog, nice till with till indicators
10	JB10	N	N	469028	6185977	HLY	O/GLFL		Of Om	0-30 30-110				Bg	110-120+	SCL-SL							1-2	L	L	2	4		Р	S0	W	black spruce forest
11	JB11	N	N	468506	6185901	KNS	TILL		Of	12-0	Ae1 Ae2	0-10 10-15	LS	Bt	15-52	CL	BCgj BC2	52-90 90-120	CL SCL				3-4	U	М	4	1	SE	MW-W	S1	W	site is washed till sand lens @100-110 J.Pine/Bk Spruce, lichen, lab tea
12	JB12	N	N	467933	6186002	KNS	TILL		Of	10-0	Ae	0-10	LS	Bt	10-65	CL	ВС	65-120	CL				6	R	U	6	3	SE	MW-W	S2	w	(Fe stone, coal flecks Photos (DC 27): 100-1321, 100-1322 - v. of steep slopes, till exposed or cutline, J.pine, wt spruce, aspen
13	JB13	N	N	468258	6185728	HLY	O/GLFL/TILL		Om Oh	0-75 75-85				Bg	85-120	SL-SCL							1-2	L	L	2	4		VP	S0	М	Black Spruce Bog/Fen, tamarack
14	JB14	N	N	467803	6185393	FIR	GLFL	10			Ae	0-13	LS	Bm grBt	13-34 34-55	LS SCL							2 and 6	S - R	L	2	3	SW	R	S1	W	aUer refusal @ 55cm - gr> cobbles, birch, aspen, wt spruce, j.pine
15	JB15	N	N	469046	6186390	MUS	0		Of	0-220													1-2	L	E	2	4		VP	S0	М	Black Spruce Bog, lab tea, sphagnum, open canopy
16	JB16	N	Y	468483	6187080	KNSgl	TILL	6			Ahe Ae	0-10 10-18	SiL-L SL	Btgj	18-47	SiCL-CL	BCgj	47-70	SiCL-CL	Ckg	70-120	SiCL-CL	2 and 6	U - R	L	3	3-4		MW-IMP	S0	w	Mottles stongest at 60-65 cm, could be HLG but gleying and mottling below 50, Aspen, j.pine, wt spruce
17	JB17	N	N	467980	6187502	MUS	0		Om	0-220													1-2	L	L	2	4		VP	S0	М	shells in profile @ > 150 cm in mesic peat, sedge grass, end of a lake
18	JB18	Υ	Y	466930	6187495	MLD	0		Of Om	0-130 130-220													1-2	L	L	2	4		VP	S0	W	intermittent frozen layers 0-130 thoUht it was perma frost but broke throUh frost @120 cm, thawed to 2.2 m
19	JB19	N	Y	466460	6187154	MIL	GLFL		Of	5-0	Ae	0-21	LS	Btj Bm	21-22 22-45	SL-L LS	BC1 BC2						2 and 6 (overall)) R	U - C	6	3	Е	R	S0	W	clay layers in BC horizon, lichen, jackpine, canberry, bearberry
20	JB20	N	N	465949	6186665	KNS	TILL	9			Ae	0-10	LS	Bt	19268	SiCL-CL	BC1 BCg	52-75 75-90	SiCL-CL SiCL-CL	Ckg	90-120	SiCL-CL	2-3	U	U	3	3-4	N	I	S0	w	Aspen, wt spruce, open canopy
21	JB21	N	N	467427	6188719	KNS	TILL		Of	10-0	Ae1 Ae2	0-11 11-23	SiL SiL	Bt	23-45	CL	ВС	45-120	CL				3-4	U	С	3	3-4		MW	S0	W	J.pine, bl spruce, bearberry, bog cran, sphagnum
22	JB22	N	N	467304	6188719	KNS	TILL	12			Ae	0-30	SiL	Bt	30-47	CL	ВС	47-120	CL				3-4	U	D	4	2-3		MW	S0	W	Till indicators reall good , iron stones, aspen, alder, rose, j.pine
23	JB23	N	N	466194	6188704	KNS	TILL		Of	6-0	Ae1 Ae2	0-12 12-20	SiL SiCL	Bt	20-55	SiCL-CL	BC1 BC2	55-65 65-120	SiCL-CL CL				3	U	U - M	3	1	W	W	S0	W	c/f (gravels at 65 cm) 6-8m jackpine, lichen, lab tea
24	JB24	N	N	469263	6188664	MUS	0		Of	0-220													1-2	L	L	2	4		VP	S0	М	some forzen/nearly frozen layers, 60% cover, poor bog, bl spruce, lab tea, sphagnum
25	JB25	N	N	469815	6188731	HLY	O/GLFL		Om	0-40				Bg	40-85	SL	BCg	85-120	SL-L				1-2	L	L	2	4		VP	S0	М	bl spruce, lab tea and sphagnum, jackpine
26	JB26	N	N	469526	6189096	KNS	TILL	8			Ae	0-15	LS	Bt	15-54	SCL-CL	ВС	54-120	CL				3-4	U	U	4	3	SW	MW	S0	W	Till indicators Fe stone coal c.f%, aspen, j.pine, wt spruce, lab tea
27	JB27	N	N	469332	6189386	MLD	0		Of	0-220													1-2	L	L	2	4		VP	S0	М	sedge grass, bl spruce, sphagnum, bog birch
28	JB28	N	N	469121	6189531	KNS	TILL	6			Ahe Ae	0-2 2-20	LS LS	Bt	20-44	CL	BC1 BCgj	44-65 65-115	CL CL	Ck	115-120	CL	4	U	С	4	2-3		MW-W	S2	W	stone size of c/f near surface, mottling at 65 cm, j.pine, wt spruce, sphagnum
29	JB29	N	N	469239	6190013	STPptzh	TILL		Of	22-0	Ahg Aeg	0-10 10-20	SiL-L SiL-L	Btg	20-45	SiCL-CL	BCg	45-120	SiCL-CL				2-3	U	D	3	3		I	S0	W	aspen, jackpine, bl spruce, sphagnum
30	JB30	N	N	468381	6188608	KNS	TILL	7	Of	0-100	Ae	0-15	SiL	Bt	15-47	SiCL-CL	ВС	47-120	SiCL-CL				4-5	U	U	4	3	WSW	MW	S0	W	feather moss aspen, bog cranberry
31	JB31	N	N	465924	6188718	MRN	O/GLFL		Oh	100-105				Bmg	105-120	SL-LS							1-2	L	L	2	4		VP	S0	М	black spruce, jackpine, sphagnum
32	JB32	N	N	465501	6188745	MLD	0		Of	0-200														L	L	2	4		VP	S0	М	W= hydraulic layer, sedge grass tamarack, willow

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depti	h A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
33	JB33	N	N	464842	6188806	KNS	TILL	7			Ae1 Ae2	0-4 4-17	SiL-L SiL-L	Bt	17-48	SiCL	ВС	48-92	CL	Ck	92-	CL	4	U	М	4	3	S	MW	S0	w	Bt is high in Fe, lots of ppt's in Ck, aspen, j.pine, wt spruce
34	JB34	N	N	464278	618818	HRR	TILL		Of	10-0	Ae	0-15	SiL	Bt	15-44	SiCL-CL	ВС	44-61	CL	Ck	61-100	CL	4	U	U	4	2	E	MW	S1	w	willow, wt spruce, feather moss
35	JB35	N	N	463918	6188831	MRN	O/GLLC		Of	0-100				Bg	100-120	SiCL								L	L	2	4		VP	S0	М	bl spruce, lab tea and sphagnum
36	JB36	N	N	463733	6188801	MUS	0		Of	0-220													1-2	L	L	2	4		VP	S0	М	bl spruce, sphagnum, tamarack
37	JB37	N	N	463497	6188829	MUS	0		Of	0-220													1-2	L	Е	2	4		VP	S0	М	bl spruce, poor bog
38	JB38	N	N	463247	6188840	MUS	0		Of	0-220														L	L	2	4		VP	S0	М	bl spruce, sedge grass
39	JB39	N	N	463579	6189046	MUS	0		Of	0-220														L	L	2			VP	S0	М	lab tea, sedge grasses
40	JB40	N	N	463467	6189316	KNS	TILL		Of	4-0	Ae	0-24	SiL	Bt	24-47	SiCL	BC1 BC2	47-85 85-	SiCL-SiC SCL-CL				1-2	L	L	3	4		MW	S0	W	j. pine, lab tea, wt spruce
41	JB41	N	N	463283	6189850	KNS	TILL	7			Ae1 Ae2	0-7 7-18	SiL SiL	Bt	18-49	CL	вс	49-120	CL				3-4	U	U	3	3	E	MW	S0	W	J.pine, aspen, low bush cranberry
42	JB42	N	N	463181	6190059	ВМТ	GLFL		Of	0-30	Aeg	30-40	SCL	Bg	40-120	SCL							1-2	U	D	2	4		VP	S0	М	
43	JB44	N	N	464498	6186805	HLY	O/GLFL		Om	0-140				Bg	140-220	SCL								L	L	2			VP	S0	М	tamarack, bog birch, sedge grass
44	JB45	Y	Y	463784	6186983	MUS	0		Of Om	0-40 40-													1-2	L	L	2			VP	S0	М	frozen @100cm, sphagnum, lichen
45	JB46	N	N	463531	6186993	KNSptgl	TILL		Of Oh	6-0	Ahe	0-10	L-CL	Bt	10-40	CL				Ckg	40-110	CL	2-3	L-U	L	3			Р	S0	W	CaCO3 starts @ 40, gleying starts at 40cm
46	JB47	N	N	463981	6186980	MUS	0		Of Om	0-65 65-220														L	L	2			VP	S0	М	sedge grass, very wet, bl spruce dying off
47	JB48	N	N	464671	6186971	MUS	0		Of Om	0-150 150-220													1-2	L	L	2			VP	S0	М	bl spruce, lab tea, sphagnum
48	JB49	N	N	465263	6187026	KNS	TILL		Of Om	7-0 0-30	Ae1 Ae2	0-5 5-20	SiL SiL	Bt IIBt	20-32 32-46	SiL-SiCL CL	IIBC	46-	CL				3-4	U	С	3	3		MW	S0	W	washed till with sand lenses loess, silty material on top
49	JB50	N	N	465483	6187001	MRN	O/GLLC		Oh Om	30-100 100-120				Bg	120-	CL							1-2	L	L	2			VP	S0	М	willow, bog birch, bl spruce
50	JB51	N	N	464807	6187128	KNSgl	TILL		Of	8-0	Ae	0-8	SiL	Bt	8-52	CL	BC	52-63	CL	CK(g)	63-	CL	3-4	U	U	4	3	SW		S0	W	Fe concutions in Ck or Ig, bright mottles, j.pine, bl spruce
51	JB52	N	N	464208	6187450	KNS	TILL	6	Of	0-100	Ae	0-6	SL	Bt	6-42	CL	BC	42-97	CL	CK(g)	97-120	CL	4-5	R	М	5	3	S	MW	S0	W	aspen, bl spruce, paper birch
52	JB53	N	N	463992	6187658	HLY	0		Om Of	100-155				Bg	155-	CL							1-2	L	L	2			VP	S0	М	bl spruce, sphagnum,, lab tea
53	JB54	N	N	463633	6187677	MLD	0		Om Om	120-220													1-2	L	D	2	2		VP	S0	М	willow, sphagnum, bl spruce, sedge grass
54	JB55	N	N	464736	6187608	MRN	TILL		Oh	30-95	Ahg	95-100		Bg	100-120								1-2	L	L	2	2-3		VP	S0	М	open canopy, bl spruce, poor bog mottling at 110cm, some varving
55	JB56	N	N	465033	6187649	DOV	GLLC O	6-0	Of	0-60	Ae	0-6	SiL	Bt	6-37	SiCL	BC	37-95	SiCL	CKgj	95-120	SiCL-SiC	3-4	U .	U - M	4	3	W	MW	S0	W	*No coarse fragments or till factors varving evident in BC, aspem, willow, alder
56	JB59	N	N	464085	6187860	HLY	TILL		Om	60-80				Bg	80-120	SiCL-CL							1-2	L	L	2			VP	S0	M	bl spruce, bog birch, grasses
57	JB60	N	N	463674	6188564	HLY	O/GLLC O		Of	0-135				Bg	135-160	SiCL							1-2	L	L	2			VP	S0	M	bl spruce, sedge grass, bog
58	JB61 JB62	N N	N N	462972 478160	6190563 6218829	HLY MRN	TILL O		Of Of	0-100				Bg Bg	100-120 60-120	CL SiCL							1-2	L	L 	2	4		VP VP	S0 S0	M	sedge grass, sphagnum, bog birch bl spruce, lab tea, sphagnum, lichens
60	JB62 JB63	N	N	477813	6218820	LVKpt	TILL GLFL/TILL		Om Of	40-60 20-0	Ahe	0-8	SiL	Bg Bt	17-45	SiCL	IIBC	45-80	LS				4 TOPO	I- U	м	4	3	 F	MW	S0 S0	W	wet profile could be gleyed but not gleying and no mottling
61	JB63 JB64	N	N	477813	6219148	STPptxszh	GLFL/TILL		Of/Om	15-0	Ae Aheg	8-17 0-8	SiL	Btg	8-42	SiCL	IIIBC	80-120 42-80	CL LS				2-3	U	E	2	4		P	S0 S0	w	black spruce forest bk spruce forest
62	JB65	N	N	478487	6220056	STPptzh	TILL		Of	30-10	Ahg	0-30		Bg	30-80	SiCL-SiC	IIIBCg 	80-120	CL 				2-3	U		2	4	N	VP	S0	w	Bg = gleyed throgh out
63	JB66	N	N	478492	6220478	MUS	0		Oh Of	10-0 0-220	Alig												1-2	L	L	2			VP	S0	м	black spruce forest bk spruce bog/fen
64	JB67	N	N	478500	6221342	MRN	TILL		Of	0-220				Bg	70-120	SiCL							1-2	L	L	2			VP	S0	M	bk spruce bog (poor)
04	JD01	IN .	IN	410000	0221342	IVIPAIN	TILL		J 51	0-70				- By	10-120	SICL							1-2				-2-		VF	30	IVI	ny shidre nod (hooi)

Site # LME	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope _ength	Aspect	Drainage	Surface Stoniness	Land Use	Comments
65	JB68	N	N	477699	6221323	KNS	TILL		Of	12-0	Ahe Aegj	0-4 4-22	SiL SiL	Bt	22-52	SiCL-CL	IBC IIBC	52-79 79-120	CL CL				3	U	М	3	4	NE	MW	S0	W	Mixed Wood Forest, aspen, bl spruce, willow
66	JB70	N	N	477045	6221403	MLD	O TILL		Of Om	0-160 160-195				Bg	195-210	CL							1-2	L		2	4		VP	S0	М	bl spruce, sphagnum, bog birch
67	JB71	N	N	476822	6221375	LVKpt	GLFL/TILL		Of	25-0	Ahe Ae	0-4 4-11	SiL SiL-SiCL	Bt	11-42	SiCL	BC1 IIBC2	42-95 95-120	SL-LS CL				2-3 TOPO	U	М	3	2	NE	MW	S0	М	bl spruce, sphagnum, lab tea
68	JB72	N	N	476227	6221405	MRN	O TILL		Of	0-60	Ah	60-70	SiL-SiCL	Bg	70-85	SiCL	ВС	85-120	CL				1-2	L	М	2	4	E	Р	S0	М	bl spruce, sphagnum, lab tea
69	JB73	N	N	475519	6221368	STPpt	TILL		Of	0-25				Bg	25-50	SiCL	BCg	50-90	SiCL	Cg	90-120	С	2-3	U	М	3	2-3	N	Р	S0	М	black spruce, bog, closed canopy
70	JB74	N	N	475218	6221422	MUS	O/GLLC		Of Om	0-120 120-200							BCg	200-220	SiC-SiCL				1-2	L		2	4		VP	S0	М	bl spruce, peat, sphagnum, lab tea
71	JB75	N	N	474938	6221412	KNS	TILL	12			Ae	0-9	SiL	Bt	17411	SiCL	ВС	47-120	CL				2-3	U	М	3	1-2	W	MW	S0	W	bl spruce, sphagnum, lichen
72	JB76	N	N	474428	6221440	MLD	0		Of	0-220													1-2	L		2	4		VP	S0	М	sedge fen black spruce
73	JB77	N	N	474297	6221439	KNS	TILL	10			Ae	0-10	SiL	Bt	10-35	SiCL	ВС	35-120	SiCL				2-3	U	М	3	2	W	MW	S0	W	sphagnum, feather moss, lab tea, mosity understory
74	JB78	N	N	473766	6221447	MRN	O GLTL		Of	0-70				Bg	70-120	SCL-CL							1-2	L		2	4		VP	S0	М	bl spruce, sphagnum, lab tea
75	JB79	N	N	473388	6221491	KNS	TILL	15			Ahe	0-5	SiL	Bt	5-35	SiCL-CL	ВС	35-120	SICL-CL				3	U	М	3	1-2	SE	WM	S0	W	bl spruce, understory sphagnum, peat,
76	JB80	N	N	472888	6221476	MUS	0		Of	0-220													1-2	L		2	4		VP	S0	М	bl spruce, sphagnum, lab tea
77	JB81	N	N	473562	6221857	MLD	0		Of	0-220													1-2	L		2	4		VP	S0	М	tamarack, sphagnum, peat
78	JB82	N	N	473717	6222524	DOV	GLLC		Of	12-0	Ahe	0-15	SiL	Bt	15-37	SiCL-SiC	ВС	37-120	SiCL-SiC				2-3	U	М	3	2	S	MW	S0	W	jackpine, bl spruce, lichen
79	JB83	N	N	474887	6222891	KNS	TILL	6			Ahe	0-14	SiL-L	Bt	14-42	CL	ВС	42-120	CL				4	U	E	4	3	S	MW	S0	W	jackpine, bl spruce, club moss
80	JB84	N	N	475493	6222771	LVKgl	GLFL/TILL		Of	0-10	Ahe	0-7	SiL	Btgj	7-40	SiCL-CL	I BC III BC	40-75 75-120	LS CL-SL				3	U	М	3	3	N	IMP MW	S0	W	bl spruce, poplar, lab tea
81	JB85	N	N	475778	6222824	MRN	O TILL		Om	0-50	Ahbg	50-60	SiL-L	Btg	60-75	CL	BCg	75-120	SCL				1-2	L		2	4		IMP-P	S0	М	till indicators, bl spruce
82	JB86	N	N	476213	6222789	LVKptgl	GLFL/TILL	20			Ahegj	0-6	SiL	Bt	20-35	SiCL-SCL	I BCg	35-100	CL				2-3	U	М	3	3-4	E	IMP-MW	S0		bl spruce 100%, feather moss
83	JB87	N	N	476881	622812	MLD	0		Of	0-220													1-2	L		2	4		VP	SO	М	bl spruce, sphagnum, bog birch, tamarack
84	JB88	N	N	477130	6222784	DOV	GLLC/GLFL	2			Ae	0-8	SiL-L	Bt	8-34	CL	I BC II BC	34-55 55-120	CL-SCL LS				3	U	М	3	2	N	MW-W	S0	W	bl spruce, jackpine, bog cran
85	JB89	N	N	467741	6221563	MUS	0		Of	0-220													1-2	L		2	4		VP	S0	М	lab tea, bl spruce, sphagnum
86	JB90	N	N	467964	6221540	MLD	0		Of Om	0-170 170-220													1-2	L		2	4		VP	S0	М	aspen, bl spruce, leather leaf
87	JB91	N	N	468276	6221555	KNSpt	TILL		Of	0-21	Ae Ae2	0-8 8-16	SiL-L SiL-L	Bt	16-42	CL	ВС	42-120	CL				4-5	R	М	4	2	Е	MW	S1-2	w	bl spruce, feather moss, bunchberry
88	JB92	N	N	468733	6221549	FIR	GLFL				Ae	0-18	LS-S	Bm	18-42	LS-S	ВС	42-90	LS-SCL				3-4	R	М	4	3	W	R	S1-2	W	bl spruce, jackpine, lichen
89	JB93	N	N	469039	6221522	MLD	0		Of	0-220													1-2	L		2	4		VP	S0	М	bl spruce, moss, lab tea
90	JB94	N	N	469024	6221264	HLY	O/GLFL		Of	0-130	Ahg	130-140	SiCL-SCL	Bg	140-150	SCL							1-2	L		2	4		VP	S0	М	sedge grass, sphagnum, bog birch
91	JB95	N	N	468985	6220926	DOV	GLLC		Of	20-0	Ae	0-6	SiL	Bt	14-34	SiCL	вс	34-120	SiCL				3	U	M-L	3	2-3	W	MW	SO	W	bl spruce , feather moss
92	JB96	N	N	468948	6220668	HLY	O/GLFL		Of	0-80				Bg	80-120	CSC-SCL							1-2	L		2	5		VP	SO	М	bl spruce, sedge grass, sphagnum
93	JB97	N	N	468991	6220210	MLD	O/GLFL		Of Om	0-40 40-160				Bg	160-180	MA SCL-SL			-				1-2	L		2	5	-	VP	S0	М	bl spruce, sedge grass, sphagnum
94	JB98	N	N	468980	6219697	HLY	O/GLFL		Of	0-90				Bg	90-120	SCL-SC							1-2	L		2	5		VP	S0	М	bl spruce, sedge grass, sphagnum
95	JB99	N	N	468978	6218953	ВМТ	GLFL		Of/Om	0-35	Aeg	35-45	SL	Btg	45-60	SCL	ВС	60-	SCL-SC				2-3	U	М	3	1-2	SW	I-P	S1	W	bl spruce, lab tea, lichen
96	JB100	N	N	468931	6218485	MLD	O/GLFL		Of	0-160				Bg	160-170	SiCL							1-2	L		2	5		VP	S0	М	dead tamarack, bl spruce, leather leaf, sphagnum

				1							, ,		1									1			1			•	1			
Site # LMB Site	Name /	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
97 JB	B101	N	N	470685	6221503	MLD	0		Of	0-220													1-2	L		2	4		VP	S0	М	leather leaf, sedge grass, sphagnum
98 JB	B102	N	N			MUS																		f		2					М	Floating bog 50 cm thick by where 2 lakes meet
99 JE	B103	N	N	469161	6221580	KNS	TILL		Of	6-0	Ae	0-15	SiL-SiCL	Bt	15-35	CL	BC1 BC2	35-85 85-110	CL CL	Ck	110-120	CL	6	R	U	6	1-2	SW	MW	S2	W	good till, lots od
100 JB	B104	N	N	469501	6221563	FORT	GLFL	5			Ae	0-3	LS	Bm Bt	3-19 19-39	LS L-SL	вс	39-120	SC-SL				6	R	U	6	1-2	SE	R	S0	W	
101 JB	B105	N	N	469727	6221459	MUS	0		Of Om	0-130 130-220													1-2	L		2	3		VP	S0	М	
102 JB	B106	N	N	469873	6222186	HLY	O/GLLC		Of	0-140				Bg	140+	SiCL							1-2	L		2	4		VP	S0	М	
103 JE	B107	N	N	470423	6222121	MLD	0		Of	0-220													1-2	L		2	5		VP	S0	М	hydaulic layer water under peat, tamarack, bl spruce, leather leaf
104 JE	B108	N	N	469929	6221936	HLY	O/GLLC		Of Om	0-120 120-130				Bg	130+	SiCL							1-2	L		2	4		VP	S0	М	bl. Spruce, tamrack, sedge
105 JE	B109	N	N	469709	6221287	KNS	TILL	7			Ae	0-12	SiL-L	Bt	12-35	SiCL	BC BC2	35-65 65-120	CL-SCL CL				5-6	R	М	5	2	SW	MW	S1	W	bl spruce, feather moss, tamarack
106 JE	B110	N	N	469692	6220866	MLD	0		Of	0-220													1-2	L		2	5		VP	S0	М	sedge, black spruce, sphagnum, tamarack
107 J E	B111	N	N	469726	6220196	MLD	0		Of	0-220													1-2	L		2	4		VP	S0	М	jackpine, sphagnum, sedge
108 K	KS1	N	N	471992	6221751	KNS	FLEO TILL		Of	0-52	Aeg	52-62	SiL-Si	Bg	62-92	SiCL	BCg	92-120+	CL				1-2	L	М	2	4		Р	S0	M/W	bl spruce, lab tea, sphagnum
109 K	KS2	N	N	472018	6222035	STPpt	TILL		Of	0-53				Bg1 Bg2	53-63 63-110	SiC CL							1-2	L	М	2	4		Р	S0	M/W	bl spruce, moss, lichen
110 K	квз	N	N	472023	6221432	LVKpt	GLFL/TILL		Of	17-0	Ae	0-7	SiL	Bt	7-26	SiCL	II BC1 BC2	26-90 90-120+	LS CL				2-3	U	U	3	2-3	W	MW	S0	W	jackpine, moss, lichen
111 K	KS4	N	N	472102	6221236	MLD	0		Of	0-220													1-2	L	М	2	1-2		VD	S0	М	bl spruce, moss, grass
112 K	KS5	N	N	471671	6221491	STPpt	TILL		Of	0-55	Aheg	55-75	SiL	Btg	75-90	SiCL	II BCg	90-120	SCL				2-3	U	М	3	4	S	Р	S0	W	bl spruce, lackpine, lab tea
113 K	KS6	N	N	471340	6221500	LVKptgl	FLEO TILL		Of	0-50	Aegj	50-60	SiL-SiCL	Bt	60-90	SiC	вс	90-120	CL				2-3	U	М	3	4	E	MW	S0	W	bl spruce, moss, lab tea
114 K	KS7	N	N	472140	6220960	MUS	0		Of Om	0-190 190-220													1-2	L	е	2	4		VP	S0	М	bl spruce, leather leaf, sedge
115 K	KS8	N	N	472252	6221466	LVKgl	GLFL/TILL		Of	16-0	Aeg	0-11	SL	II Btg	11-41	SiC	вс	41-	SiC-CL				2-3	U	М	3	3	Е	Р	S0	W	bl spruce, moss, lichen, lab tea
116 K	KS9	N	N	470898	6221508	MUS	0		Of	0-220													1-2	L	M - L	2	4		Р	S0	М	bl; spruce, lab tea, moss
117 K	(S10	N	N	470432	6221435	KNS	TILL		Of	10-0	Ae	0-32	SiL	Bt1 Bt2	32-52 52-88	SiC SCL	BC	88-120+	CL				4-5	R	M - U	4	3	N		S0	W	bl; spruce, lab tea, moss
118 K	(S11	N	N	470116	6221275	MUS	O TILL		Of Om	0-98 98-170							BCg	170+	SiCL				1-2	L	М	2	3		VP	S0	М	bl spruce, bog birch, lab tea
119 K	(S12	N	N	469935	6221325	MUS	0		Of Om	0-190 190-220													1-2	L	М	2	4		VP	S0	М	bl spruce, grass, moss
120 L	LP1	N	N	473343	6182679	LVK	GLFL/TILL	8			Ae Aej	0-7 7-28	SiL SiCL	Bt	28-38	CL	BC	38-120	CL-SiC	Ck	120+	CL-SiC	4-5	M - T	U	5	3	E	W-MW	S0	W	Bl spruce, jackpine, aspen
121 L	LP2	N	N			MLD	O/GLLC		Of	210-0										Cg	0-10	С		L	E	2			P-VP	S0	W	sedge, bog birch, tamarack, willow
122 L	LP3	N	N	472895	6183501	LVK	GLFL/TILL	12			Ae	0-13	LS	Bm Bt	13-36 36-43	LS SCL	BC	43-92	SL	С	92-120	SCL	2-4	M - T	U	3	1-3		MW	S0	W	sedge, bog birch, tamarack, willow
123 L	LP4	N	N	472712	6183657	MLD	0		Of Om	0-100 100-170	Ah	170-185	SiC							Cg	185-220			L	E	2			Р	S0	W	Ah- LOTS OF ORGANICS, bl spruce, lab tea sphagnum
124 L	LP5	N	Y	472698	6183740	KNS	TILL	6			Ae	0-14	SL	Bt1 Bt2	14-36 36-53	SCL SCL				Ck	53-120+	CL	4	Н	С	4	1		W	S0	W	Cutline, esker, aspen
125 L	LP6	N	N	474044	6184079	KNS	TILL	10			Ae	0-27	SiL	Bt	27-108	SCL				CK II CK	108-110 110+	CL SL	5	I-T	L	5	2	E	MW-W	S0-1	W	Aspen, wt spruce, willow, rose
126 L	LP7	N	N	473887	6184071	STPptxs	GLFL/TILL		Of Om Of	0-30 30-40 0-36	Ah	40-50	С							I Cg II Cg	50-110 110+	LS SiL-SiCL		L	E	2			Р	S0	W	black spruce, willow
127 L	LP8	N	N	473633	6184103	MRN	O/GLLC		Om Oh	36-100 100-105										I Cg II Cg	105-140 140-220+	SiL CL-C		L	E	2			P-VP	S0	W	bl spruce, lab tea, sphagnum, willow, bog birch
128 L	LP9	N	N	473264	6184057	KNS	TILL	11			Ae	0-25	LS-SL	Bt	25-51	SiCL	BC	51-104	SCL-CL	Ck	104+	CL	4-5	М	Т	5	1-2	N	MW	S1	W	Aspen, rose, wt spruce

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
129	LP10	N	N	472823	6184127	MLD	O/GLFL		Of Om Oh	0-105 105-115 115-144	Ah	144-160		Bg	160-175	SL-SCL	BCg	175-	CL-C					L	E	2			Р	S0	W	bl spruce, burned area, sedge bad tea, sphagnum
130	LP11	N	N	470829	6184168	HLY	O TILL		Of Om Oh	0-80 80-90 90-100							BCg	100+	CL					L	E	2			P-VP	S0	W	black spruce, tamarack, sedge, sphagnum, bog birch, willow
131	LP12	Y	Y	471165	6184105	MILxt	GLFL/TILL		Of	8-0	Ae	0-22	LS	Bm	22-42	LS	ВС	42-82	LS	С	82-120	SCL	5	М	U	5	1	Е	W-R	S0	W	jack pine, black spruce; possible esker
132	LP13	N	N	471466	6184159	MLD	O/GLFL		Of Om Oh	0-115 115-165 165-180	Aeg	180-210	SCL				BCg	210-220+	CL					L	E	2			Р	S0	W	black spruce, tamarack, sedge, sphagnum, bog birch, willow, labrador tea
133	LP14	N	N	471775	6184712	KNS	TILL		Of	10-0	Ahe	0-7	CL	Bt	14793	CL	ВС	40-65	CL-sSiCL				2	M - R	С	3	3	-	MW-W	S0	W	aspen, lab tea, bl spruce
134	LP15	N	N	471926	6184096	MLD	O/GLLC		Of Om	0-170 170-185														L	E	2			Р	S0	W	tamarck, sedge, bog birch
135	LP16	N	N	472328	6184148	LVKgl	GLFL/TILL	9			Ae1 Ae2	0-7 7-22	SiL SL	Bt	22-35	CL	С	35-46	S				3	U	L-T	3	1	N	MW-IMP	S0	W	aspen, bla spruce, feather moss
136	LP17	N	N	472377	6184310	MRN			Om	0-110														L	E				Р	S0	W	bl spruce, sphagnum, horse tail, burned area
137	LP18	N	N	472445	6184339	KNS	TILL	5			Ae	0-9	LS	Bt	9-38	CL	вс	38-105	SCL				4-5	М	С	5	1	SW	MW	S1	W	burned area, bl spruce, most veg dead
138	LP19	N	N	472322	6184401	LVK	GLFL/TILL	5			Ae	0-6	LS	Bt	9-50	SCL	BC	50-120	LS				4-5	М	С	5			MW	S1	W	wt spruce, aspen, paper birch, burned area
139	LP20	N	N	471912	6185171	KNS	TILL	8			Ae	0-14	SiL	Bt	14-35	SCL	BC1 BC2 BC3	35-71 71-108 108-	SCL SCL SL				4	М	U	4	4-5	W	MW	S0	W	edge of burned area; white spruce and aspen; gravel percentage increases with depth
140	LP21	N	N	471869	6185369	KNS	TILL	6			Ae	0-18	SiL	Bt	18-42	SiCL	ВС	42-115	CL	Ck	115-120	CL	3-4	М	M - U	4	2-3	NW	MW	S1	W	lots of deadfall; aspen overstory with young white spruce, willow, alder, bunchberry, rose
141	LP22	N	N	471632	6185834	STPpt	TILL		Of	0-36							BCg	36-75	SiL	Cg	75-120	SiL	3	U - M	T	2	3	W	VP	S0	W	burn area, dead black spruce, coarse fragments increase at 105 cm
142	LP23	N	N	471022	6185955	KNS	TILL				Ae	0-10	LS	Bt	15615	SCL	ВС	42-120	SCL				6	М	С	6	1	S	W-MW	S0	W	Burned area, mostly J.Pine, was esker
143	LP24	N	N	471226	6186516	MUS	0		Of Om	0-90 90-220														L-U	Т	2			Р	S0	W	aspen, birch, rose, fireweed, continuous ridge
144	LP24.1	N	N	471446	6186216	KNS	GLFL	16			Ae	0-15	SiL	Bt	15-39	CL	BC1 BC2	39-80 80-120	CL LS				4	М	М	4	2-3	NE	MW-I	S0	W	phagnum, feather moss, bl spruce, lab tea, area surrounded by aspen
145	LP25	N	N	470960	6187018	KNS	TILL	19			Ae	0-16	SiL	Bt	16-41	SiCL	BC	41-	SCL				3-4	М	L	4	2-3	NW	MW	S0	W	aspen, rose, bunchberry, some wt spruce
146	LP26	N	N	470892	6187375	MIL	GLFL				Ahe Ae	0-12 12-32	LS LS	Btj	32-60	SL				С	60+	S-LS	4	М	T	4	3	NW	W	S0	W	burned area, j.pine, wt spruce, rose, grasses
147	LP27	N	N			KNSgr	TILL	7			Ae	0-20	SiL	Bt	20-45	CL	BC	45-105	CL	Ck	105-	CL	3	U	L	3	3	NE	MW	S0	W	No info written, stones between Ae and Bt jack pine, black spruce, paper birch, labrador
148	LP28	N	N	474009	6185065	KNS	TILL		Of	19-0	Ae	0-5	SL-LS	Bt	5-23	CL	BC	23-85	SiC	Ck	85-	SCL	4-5	М	Т	5	1	SE	MW	S0	W	tea, some aspen, sand lenses with strong reaction aspen, fireweed, rose; auger refusal at 57 cm
149	LP29	N	N	473429	6185053	LVKgr	GLFL/TILL	14			Ae	0-8	SL	Bt	8-26	SCL	BC	26-57	LS				6	Н	U	6	2-3	S	W	S1	W	due to gravel burn area, dead black spruce, all peat has
150	LP30	N	N	472680	6185060	KNS	TILL		Of	0-150	Ae	0-17	SL	Bt	17-37	SiCL	BCg	37-54	SL	Ckg	54-	SiCL	4	U	M _	4	2	S	I-P	S0	W	burned off, some grasses growing black spruce, tamarack, sphagnum, sedges,
151	LP31	N	N	476053	6184012	MLD	O/GLFL		Om	150-170	Ah	170-190	SL		40.00		BCg	190-	SCL-SL					L	E .	2			P-VP	S0	W	labrador tea
152	LP32	Y	Y	476316	6183954	LVK	GLFL/TILL COLLUVIATED	8-0			Ae	0-12	SL	Bt	12-28	SCL	BC	28-96	SCL	Ck	96-120+	SCL	2	U	L	2			<u>'</u>	S0		black spruce, jack pine, sphagnum, labrador teal aspen, jack pine, white spruce, rose, labrador
153	LP33	N N	N	476591	6184049	MLD	TILL	8	Of	0.245	Ae	0-25	SiL 	Bt	25-45	CL 	BC	45-110	SiC	Ck C	110+	SiC	5-6	H	C E	6	2	SW	W P-VP	S0		tea, low bush cranberry, feather mosses; gravel increases with depth
154	LP34	N N	N	476577	6184003 6183981	SRT	O/GLFL COLLUVIATED	10		0-215	Αο			 Bt	31-56		BC	 EC 0E	SiC		215+	SCL		L M - H	C	6	2			S0		black spruce, labrador tea, sphagnum, sedges
156	LP35 LP36	N N	N N	476971 477201	6183981	MLD	TILL		Of	0-220	Ae 	0-31	SiL 	 Bt	31-56	CL 	 BC	56-95		Ck 	95-110	SIC	5-6	M-H L	F	2			 P	S0 S0	w	jack pine, some aspen, feather mosses, willow sphagnum mosses
157	LP36	N	N	477853	6183888	SRT	COLLUVIATED	10		0-220	Ae	0-17	SiL	Bt	17-37	CL	BC	37-110	CL	Ck	110-120+	CL-C	4-5	М	M	5	2	N	MW	S0	w	hill cut, aspen, white spruce, rose, lycopodium
158	LP38	Y	Y	478271	6183878	SRT	TILL	5			Ae	0-5	SiL	Bt	5-55	CL	BCg	55-73	L	Ckg	73-110+	L	5	M	M	5	3	N	MW-I	SO	w	(club moss), bunchberry, some black spruce aspen, white spruce, rose, fireweed, bunchberry, red willow, feather moss, labrador
159	LP39	N N	N	479200	6183791	HLY	O/GLLC		Of	0-50										Cg	55-120	CL		L	E	2					w	tea black spruce, tamarack, paper birch, labrador
160	LP40	N	N	479660	6183757	KNS	TILL		Oh Of	50-55 0-20	Ahe Ae	20-38 38-70	SiL SiL	Btg	85-100	SCL	BCg	100+	SiC				3	М	D	3	2-3	NE	P	SO	w	tea, sphagnum, willow, alder paper birch, white spruce, feather and club
100	Lr 40	''	"	77 3000	5100701	1410	1122		- 51	0 20	Ae2	70-85	SiL	Jig	55 100		Dog	100+	0.0					141			20	111		55		mosses

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
161	LP41	N	N	479944	6183733	FORTzb	GLFL	(cm)	Of	0-3	Ae	0-18	LS	Bm Bt	18-38 38-78	LS SCL	BC	(cm) 78+	SC				4	U	U	4	1	NW	W-R	S0	w	jack pine, white spruce, labrador tea; auger refusal at 78 cm due to gravel
162	LP42	N	N	457004	6192549	LVKgr	GLFL/TILL		Of	13-0	Ae	0-11	SiL	Bt	11-37	CL	ВС	37-88	SC	Ck	88-120+	SC	3	U	L	3	2	NE	MW-I	S0	w	bl spruce, feather moss, jackpine
163	LP43	N	N			MLD	0		Of	0-220														L	E	2			VP	S0	W	bl spruce, tamarack, lab tea
164	LP44	N	N	456210	6193024	LVKgI	GLFL/TILL	11			Ae	0-26	SiL	Bt	26-42	CL	вс	42-72	SiC	Ck	72-120+	SiCL		L	E	2			MW	S0	w	wt spruce, aspen, lots of dead fall
165	LP45	N	N	455742	6193350	MRN	O TILL		Of	0-58							BCg	58-110	CL	Cg	110-	SCL		L	E	2				S0	w	bl spruce, lab tea, bog birch, willow, sedge
166	LP46	N	N	455353	6193847	KNSgl	TILL	5			Ahe Ae	0-8 8-28	SiL SiL	Bt	28-41	CL	вс	41+	SCL-CL				2	U	М	2	4	SW	MW	S0	W	wt spruce, aspen, paper birch, rose
167	LP47	N	N	455310	6194486	MLD	O/GLLC		Of Om	0-150 150-165										Cg	165+	SiCL		L	E	2			P-VP	S0	W	bl spruce, willow, sedge, lab tea
168	LP48	N	N	455363	6194838	MRN	O/GLLC		Of Oh	0-52 52-63							BCg	63-120+	SC					L	E	2						bl spruce, sphagnum, lab tea
169	LP49	N	N	455129	6195052	MLD	0		Of	0-220														L	E	2			VP.VP	S0	W	bl spruce, sedge, sphagnum
170	LP50	N	N	455389	6195575	MLD	O/GLLC		Of Om Oh	0-100 100-115 115-125							BCg	125-185	SiC				2	U	Т	2	5-6	NW	VP	S0	W	bl spruce, sedges, sphagnum
171	LP51	N	N	455866	6195610	LVKgl	GLFL/TILL		Of	15-0	Ae1 Ae2	0-14 14-38	SiL SiCL	Bt	38-52	CL	ВС	52-120+	SiC				3	M - U	М	3	4	E-SE	MW		W	j. pine, bl spruce, feather moss, lab tea
172	LP52	N	N	456291	6195494	MUS	0		Of	0-220+														L	E	2			VP	S0	W	
173	LP53	N	N	456379	6195465	MUS	0		Of	0-125														L	E	2			VP	S0	W	
174	LP54	N	N	456604	6194424	MLD	0		Of	0-320														L	E	2			Р	S0	W	bl spruce, lab tea, sedges
175	LP55	N	N	456093	6194447	KNS	Till	14			Ae	0-21	SiL	Bt	21-45	SiCL	ВС	45-	CL	Ck		CL	3	М	U	3	3	N	MW	S0	W	aspen, wt spruce, alder, lab tea
176	LP56	N	N	478411	6218873	MRN	O TILL		Of	0-60										Cg	60-120	SiC		L	E	2			Р	S0	W/M	bl srpuce, lab tea, horsetail
177	LP57	N	N	478419	6218439	FORTpt	GLFL		Of	15-0	Ae	0-9	SL	Bt	9-32	SCL	ВС	32-82	SL	С		SL-vcS		L	E	2			MW	S0	W	bl spruce, lab tea, feather moss, rose
178	LP58	N	N	478470	6218285	LVK	GLFL/TILL		Of	6-0	Ahej	0-8	SiL	Bt	8-32	SiCL	ВС	32-54	SCL	С	54-120+	CL		L	E	2			Р	S0	W	bl spruce, j.pine, lab tea
179	LP59	N	N	478445	6219280	LVK	GLFL/TILL	10			Ahe Ae	0-11 11-38	SiL SiL	Bt	38-58	SiCL-CL	ВС	58-110	SiC	С	110+	С	3	M - U	L-T	3	3-4	W	MW	S0	W	Aspen, wt spruce, willow
180	LP60	N	N	478486	6219868	KNS	TILL	3			Ae	0-3	SiL	Bt	3-31	SiCL	ВС	31+	CL				3	M - U	L-T	3	4	E	I-MW	S0	W	bl spurce, poplar, paper birch, feather moss
181	LP61	N	N	478479	6220258	MRN	0		Of	0-100										Cg	100+	SiL-SiCL		L	E	2			Р	S0	W	bl spruce, lab tea, sphagnum
182	LP62	N	N	478490	6220832	STPzh	TILL		Of	14-0	Ahe Ae	0-4 4-12	SiCL SiL	Btg	12-42	SiCL	BCg	42+	SCL				3	U	L	3	3-4	S	I-P	S0	W	bl; spruce, lab tea, bog cran
183	LP63	N	N	478087	6221287	STPzh	TILL		Of	38-0	Ahe Ae	0-4 4-12	SiCL SiL	Btg	12-31	SiCL	ВС	31-75	CL	С	75-120	CL		L	E	2			Р	S0	W	bl; spruce, lab tea, feather moss
184	LP64	N	N	473178	6227609	MUS	O TILL		Of Om Oh	0-85 85-100 100-130	Ah	130-145	SiCL-CL	Bt	145-160	CL	BCg	160-180	CL-C					L	E	2			Р	S0	W	bl; spruce, lab tea, feather moss
185	LP65	N	N	472767	6231249	FORT	FLEOGLFL		Of Of	13-0 0-50	Ae	0-8	SiL	Bt	38593	SiCL-CL	ВС	29-85	CL	С	85-120+	S	3-4	М	U	4	3-4	N	MW	S0	W	bl; spruce, lab tea, feather moss
186	LP66	N	N	472517	6230882	MRN	O TILL		Om Oh Of	50-65 65-75 0-40	Ah	75-85	SiC	Bg	85-110	SiC				С	110+	С		L	E	2			Р	S0	W	bl; spruce, lab tea, feather moss
187	LP67	N	N	472529	6230486	MRN	O TILL		Om Oh	40-55 55-75	Ah	75-95	SiC	Bg	95-110	SC				С	110+	SiC		L	E	2			VP	S0	W	bl; spruce, lab tea, feather moss
188	LP68	Υ	Υ	472443	6229737	MLD	0		Of	0-220+														L	E	2			VP	S0	W	bl spruce, lab tea, sphagnum
189	LP69	N	N	471973	6229598	HLY	O TILL		Of	0-83				Bg	83-120+	SiC								U-L	E	2			VP	S0	W	bl spruce, lab tea, sphagnum
190	LP70	N	N	471702	6229623	KNS	TILL		Of	14-0	Ae	0-8	SiL	Bt	8-41	CL	ВС	41-65	CL	C II C	65-82 82+	SiC SC	7	Н	M - U	6	1	S	MW	S0	W	bl spruce, poplar feather moss
191	LP71	N	Y	473226	6229612	MLD	0		Of	0-220														L	D	2			VP.VP	S0	М	feather moss, sedge, sphagnum, no trees
192	LP72	N	N	473124	6229585	KNS	TILL	9			Ahe	0-6	SL	Bt	6-33	CL	ВС	33-110	SiC	С	110+	SiC	3	Н	U	3	3-4	NE	MW-I	S0	W	bl spruce, rose, poplar

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
193	LP73	N	N	472457	6229426	MLD	0		Of	0-220														L	E	2			VP	S0	М	bl spruce, lab tea, sphagnum
194	LP74	N	N	472420	6229049	STPptzh	TILL		Of	0-51	Ae	51-56	SiL	Btg	56-72	SiCL	BCg	72-120+	SiC					L	E	2			VP	S0	W	bl spruce, feather moss, lab tea
195	LP75	N	N	472382	6228801	HLY	O TILL		Of	0-61							BCg	61-90	SiCL	С	90-		2	U	Т	2	4	S	VP	S0	М	
196	LP76	N	Y	472356	6228631	MLD	0		Of Om	0-90 90-220														L	D	2			VP	S0	М	mineral content incresed with depth but is still distinctly organic, sedge willow, feather moss
197	LP77	N	N	472343	6228273	MLD	O TILL		Of Om	0-155 155-220										Cg	220+	SiC		L	D	2			VP	S0	М	bl spruce, bog birch, sedges
198	LP78	N	N	472359	6228088	LVKzb	GLFL/TILL		Of	11-0	Ae	0-8	SL	Bm Bt	8-20 20-52	LS-SL SCL	ВС	52-82	SL	Ck	82-120+		5	M - H	M - L	5	2-3	N-NE	MW	S0	w	bl spruce, feather moss, lab tea
199	LP79	N	N	472333	6227837	MLD	0		Of	0-220					-									h	E	2		1				bl spruce, sedge, sphagnum
200	LP80	N	N	472599	6228185	MUS	O TILL		Of Om	0-115 115-164					-		ВС	164-200	CL	Cg	200	SiC-C		L	D	2		1	VP	S0	М	bl spruce, sphagnum, lab tea, frozen at 65cm
201	LP81	N	N	473193	6228100	KNS	TILL		Of	7-0	Ae	0-7	SL	Bt	7-45	SCL	ВС	45-70	CL	С	70-120	C-CL		L	E	2		1	MW	S0	W	bl spruce, lab tea, dead j.pine
202	LP82	N	Y	473411	6228144	KNS	TILL	16			Ae	0-8	SiL	Bt	8-32	SiCL	ВС	32-75	CL	С	75-80	cs	5	M - H	U	5	3	NW	MW	S0	W	bl spruce, paper birch, lab tea
203	LP83	N	N	473612	6228143	MUS	0		Of	0-220+														L	D	2			Р	S0	W	bl spruce, lab tea, sphagnum
204	LP84	N	N	473932	6228110	MUS	О		Of	0-220+														L	D	2			VP	S0	W	bl spruce, feather moss, lab tea
205	LP85	N	N	474456	6228102	MLD	0		Of	0-220+														L	D	2			VP	S0	М	sedge, feather moss, bog cran
206	LP86	N	N	474842	6228120	MUS	0		Of	0-220+														L	E	2			VP	S0	M/W	bl. Spruce, larch, sedge
207	LP87	N	N	475196	6228100	KNS	TILL		Of	13-0	Ae	0-11	SiL	Bt	11-37	SiCL	вс	37-120	CL-SiCL				6	M - H	U	6	3-4	N	MW	S0	W	bl spruce, poplar, club moss
208	LP88	N	N	475467	6228123	KNS	TILL		Of	14-0	Ae1 Ae2	0-12 12-25	SL SL	Bt	25-45	CL	вс	45-75	SL	С	75-120+	CL-SCL	5-6	M - H	С	5	2	N	MW	S0	W	bl spruce, lab tea, jackpine
209	LP89	N	Y	475583	6228096	KNSpt	TILL		Of	16-0	Ahe/Ae	0-9	SiL	Bt	9-48	CL	ВС	48-62	CL	С	62-		2	М	Т	2	3	NE	MW-I	S0	W	bl spruce, feather moss, jackpine
210	LP90	N	N	475989	6228110	MRN	O TILL		Of	0-105	Ah Ae	105-115 115-120	SiCL SiL										variable	М	М		4	Е	MW	S0	M/W	frozen 75-105, bl spruce, lab tea
211	LP91	N	N	475904	6227835	MUS	0		Of	0-220+														L	D-E	2			VP	S0	M/W	bl spruce, lab tea, sphagnum
212	LP92	N	N	476064	6627693	KNS	TILL		Of	12-0	Ae	0-11	SL	Bt	11-36	CL	ВС	36-74	SCL	С	74-	SCL		M - H	L - M		2	SE	MW	S0	M/W	bl spruce, jackpine, feather moss
213	LP93	Υ	Y	476459	6227575	FORTzb	GLFL		Of	12-0	Ae	0-6	SL	Bm Bt	6-33 33-52	SL SCL	ВС	52-120	SCL-SL				6	М	U	6	3	N	MW	S0	W	bl spruce, feather moss, lab tea
214	LP94	N	N	475966	6227542	KNS	TILL		Of	5-0	Ae	0-11	SL	Bt	11-37	CL	ВС	37-110	CL	С	1100-120+	SiC	6	М		6	3	Е	MW	S0	W	aspen, wt spruce, feather moss
215	LP95	N	N	475661	6227313	MUS	O/GLFL		Of	0-149										Cg	149-220	LS		L	D	2			VP	S0	M/W	bl spruce, lab tea sphagnum
216	LP96	N	N	475686	6226904	MUS	O TILL		Of Om	0-160 160-170	Ah Aeg	170-195 195-210	SiCL SiL	Btg	210-220	SiC								L	D	2			VP	S0	M/W	bl spruce, sphagnum, lab tea
217	LP97	N	N	475639	6227508	MUS	0		Of	0-220														L	D	2			VP	S0	M/W	bl spruce, sphagnum, lab tea
218	LP98	N	N	475410	6227498	MUS	0		Of	0-220+														L	D	2			VP	S0	M/W	bl spruce, sphagnum, lab tea
219	LP99	N	N	475095	6227487	MUS	0		Of	0-220+														L	D	2				S0	M/W	bl spruce, sphagnum, lab tea
220	LP100	N	N	474899	6227480	MUS	0		Of	0-220+														L	E	2			VP	S0	М	bl spruce, lab tea, leather leaf
221	LP101	N	N	474690	6227471	MLD	0		Of	0-220+														L	E	2			VP	S0	М	lab tea, sphagnum, bog birch, no trees
222	LP102	N	N	474250	6227453	MLD	0		Of	0-220+														L	D	2			VP	S0	W	sedge, leather leaf, sphagnum
223	LP103	N	N	474271	6227015	MLD	O/GLLC		Of	0-200							BCg	200-220	CL					L	D	2			VP	S0	M/W	bl spruce, sphagnum, lab tea
224	LP104	N	N	474044	6227180	MRN	O/GLLC		Of Om	0-70 70-90	Ah	90-100	CL	Bg	100-120	SCL-CL								L	D	2			VP	S0	M/W	bl spruce, lab tea, feather moss

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
225	LP105	N	N	473749	6227067	MLD	0		Of	0-220														L	D	2			VP	S0	M/W	sedge, leather leaf, sphagnum
226	LP106	N	N	473600	6227430	MLD	0		Of	0-220+														L	D	2			VP	S0	M/W	
227	LP107	N	N	473556	6227435	MRN	O/GLLC		Of Om	0-66 66-80	Ae	80-100	SiC											L	D	2			VP	S0	w	black spruce, lab tea, feather moss
228	LP108	N	N	472248	6626541	KNSpt	TILL		Of	16-0	Ae	0-7	SiL	Bt	7-25	SiCL	ВС	25-62	CL	C II C	62-110 110+	SiC SC	5	M - H	U	4	2	SW	MW	S0	w	bl spruce, feather moss, bunchberry
229	LP109	N	N	472274	not on datashee	e MRN	O/GLLC		Of Om	0-60 60-90				Bg	90-120	CL-SiCL								L	D	2			VP	S0	w	bl spruce, feather moss, sphagnum
230	LP110	N	N	472264	6227320	MLD	0		Of	0-220+														L	D	2			VP		w	sedge, sphagnum, bog birch
231	LP111	N	N	472766	6226882	KNS	TILL		Of	14-0	Ae	0-12	SiL	Bt	12-32	SiCL	ВС	32-75	CL	С	75-	SCL	3	M - H	Т	3	1	Ν	I	S0	W	bl spruce, feather moss, lab tea
232	LP112	N	N	472773	6227368	KNS	TILL		Of	7-0	Ahe	0-9	SiL	Bt	9-42	CL-SiCL	ВС	42-62	CL	Cg	62-120+	SiC		L	E	2		1	I-P	S0	W	bl spruce, leather leaf, sphagnum
233	LP113	N	N	473012	6227409	MRN	O TILL		Of	0-75				Bg	75-110	SiC				Cg	110-	SiCL		L	D	2			Р	S0	W	
234	LP114	N	N	473248	6227415	MRN	0		Of Om	0-85 85-90				Btg	90-120	SCL								L	E	2			P-VP	S0	W	frozen 50-70, bl spruce, lab tea, feather moss
235	SA1	N	N	470850	6180641	MKWaa	0		Of Om Omz	0-40 40-60 60+														L	E	2			P-VP	S0	М	bl spruce, bog birch, sedge
236	SA2	N	N	470916	6180486	HLY	0		Of Om Of	0-40 40-120 120-220+														L	E	2			VP	S0	М	bl spruce, lab tea, bog cran
237	SA3	N	N	470819	6180764	KNS	TILL		Of	10-0	Ae	0-8	SL	Bt	18-60	CL-C	вс	60-110	CL				4	Н	М	4	2	S	MW	S1-2	W	bl spruce, tamarack, sedge
238	SA4	N	N	470500	6180939	DOVgl	GLLC	5			Ae	0-5	SiL	Btgj	15-70	С	ВС	70-100	С	Ck	100-110+	С	2-3	U	M - U	3	3	S	MU-I	S0	W	bl spruce, tamarack, sphagnum
239	SA5	Y	Y	470027	6180948	STP	TILL				Ah	0-10	SL	Bg	10-40	SL	BCg	40-110+	CL					L	E	2			Р	S0	М	bl srpuce, lab tea, sedge, burnt
240	SA6	N	N	469451	6180952	HLY	O TILL		Of Om	0-10 10-50				Bg	50-75	SL	BCg	75-100	SCL				2-3	U	L	3	4	S	Р	S0	М	bl spruce, tamarack, alder
241	SA7	N	N	468995	618094	MRN	O TILL		Of Om	0-10 10-80				Bg	80-110+	CL								L	E	2			Р	S0	М	bl spruce, tamarack, moss
242	SA8	N	N	468475	6180966	MIL	GLFL				Ae	0-10	LS	Bm	10-120	LS				С	120-130	LS	4-5	Н	С	4	4-5		W-R	S0	W	j.pine, bl spruce, aspen
243	SA9	N	N	467946	6180967	HLY	O TILL		Of Om	0-20 20-120				Bg	120-130	CL							2	L	E	2	3		Р	S0	М	j.pine, black spruce, sphagnum
244	SA10	N	N	4677472	6181380	KNS	TILL				Ae	0-10	SiL	Bt	40-90	SiCL	ВС	90-110+	CL				4-5	Н	С	4	2-3		MW	S0	W	aspen, j.pine, bl spruce
245	SA11	N	N	466992	6182015	HLY	O TILL		Of Om	0-100 100-120				Bg	120-130	CL							2	L	E	2	3		Р		М	bl spruce, lab tea, moss
246	SA12	N	N	466519	6182611	STPpt	TILL		Of Om	0-40 40-50				Bg	50-100								3	U	М	3	2	N	Р	S1	М	sedge, tamarack, bl spruce
247	SA13	N	N	467223	6182702	MUS	0		Of	0-200				Bg	200-210	CL								L	E	2			VP	S0	М	bl spruce, tamarack, willow
248	SA14	N	N	467846	6182693	MUS	0		Of Om	0-80 80-100				Bg	100-110+	CL							2	L	E	2			VP	S0	М	j.pine, bl spruce, moss
249	SA15	N	N	468807	6182688	MRN	O TILL		Of	0-75				Bg	75-85+	CL							2-3	ı	М	3	4	Е	Р	S0	М	bl spruce, j.pine, moss
250	SA16	N	N	470014	6182678	MIL	GLFL	3			Ae	0-5	SL	Bm1 Bm2	5-45 45-100	SL SL	ВС	100-120	L				3	ı	М	3	4	Е	Р	S0	М	aspen, bl spruce, fireweed
251	SA17	N	N	470254	6182000	MRN	0		Of Om	0-20 20-110				Bg	110-120	SCL							3-4	ı	Т	4	3	N	VO	S0	М	bl spruce, lab tea, moss
252	SA18	N	N	499306	6157035	MUS	0		Of	0-220														L	E	2			VP	S0	М	bl spruce, sphagnum, lab tea
253	SA19	N	N	499297	6156944	MRN	0		Of	0-110				Bg	110-150	SL								L	E	2			Р	S0	М	bl spruce, lab tea, moss
254	SA20	N	N	499266	6156863	MIL	GLFL	3			Ae	0-15	LS	Bjm	15-70	LS	ВС	70-120	LS				4	ı	М	4	4	S	R	S0	W	bl spruce, lab tea, moss
255	SA21	N	N	464672	6169907	втм	GLFL		Ofm	0-10				Bg1 Bg2	10-50 50-100	LS LS							1-2	L	E	2			Р		М	bl spruce, carex, lab tea
256	SA22	N	N	465534	6169898	STPpt	TILL		Of Om	0-23 23-45				Bg	45-110	CL							1-2	L	Е	2			Р		М	bl spruce, carex, lab tea

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position		Slope _ength	Aspect	Drainage	Surface Stoniness	Land Use	Comments
257	SA23	N	N	465513	6169908	KNSgl	TILL		Ofm	0-10				Bg	10-120	SCL									М				Р	S2	М	moss, sedge, few bl spruce
258	SA24	N	Υ	466339	6169939	HLY	O TILL		Of	0-120				Bg	120-140	CL								L	Е	2			Р	S0	М	bl spruce, sedge, moss
259	SA25	N	N	466948	6169944	STPpt	TILL		Of	0-20	Ahg Aeg	20-22 22-45	SiL SiL	Btg	45-85	HCL	BCg	85-110	CL					L	E	2			Р	S1-2	М	bl spruce, moss, j.pine
260	SA26	Υ	Y	466949	6168934	MUS	O TILL		Of	0-200				II Bg	200-220	CL								h	E	2			Р			bl spruce, moss, j.pine, burnt
261	SA27	N	N	466927	6168123	HLY	O/GLFL		Of	0-135				Bg	135-150	SC								L	E	2			Р	S0	М	bl spruce, moss, j.pine
262	SA28	Υ	Y	465853	6168132	KNSzb	TILL	5			Ae	0-18	SL-LS	Bm Bt	18-50 50-90	SL CL	ВС	90-140	CL				3	U	М	3	3	NW	MW	S2	М	bl spruce, carex, bog birch,burnt
263	SA29	N	N	464826	6168142	MUS	O TILL		Of Om	0-190 190-220				Bg	220-230	SCL								L	E	2			Р		М	bl spruce, j.pine, moss
264	SA30	N	N	464023	6168490	KNSgl	TILL	10			Aeg	0-5	SiL	Bt	5-45	CL	ВС	45-110	CL				3	U	L	3	3	S	I	S1	М	bl spruce, lab tea, moss
265	SA31	N	N	463576	6168823	MRN	O TILL		Of	0-80				Bg	80-100	CL							3-4	L-T	М	2	4		Р	S2	М	bl spruce, moss
266	SA32	N	N	463096	6169193	MUS	0		Of	0-200+													1-2	h	Е	2			Р	S0		aspen, bl spruce, j.pine
267	SA33	N	N	462895	6169768	MUS	O/TILL		Of Om	0-40 40-200				Bg	200-210	CL					-			L	E	2			Р		М	bl spruce, larch, sedge
268	SA34	N	N	462899	6170504	MRN	0		Of	0-220													1-2	h	E	2			VP	S0	М	bl spruce, tamarack, sedge
269	SA35	N	N	463627	6170922	STPpt	TILL		Of	0-50				II Bg	50-90	CL					-			L	E	2			Р		М	burned area
270	SA36	N	N	463103	6170967	MUS	0		Of	0-220											-			h	E	2						sedge, bog birch
271	SA37	N	N	463414	6171267	MUS	0		Of Om	0-100 100-220													1-2	L	E	2			VP	S0	М	bl spruce, birch, grasses
272	SA38	N	N	463689	6171676	MRN	O TILL		Of	0-100	Ahg	100-110	CL	Bg	110-130	CL							1-2	L	E	2			Р	S0	М	bl spruce, lab tea, moss
273	SA39	N	N	463459	6172025	MRN	O/GLLC		Of	0-80	Ahg	80-90	SiCL	Bg	90-110	С							1-2	L	E	2	1-2		Р	S0	М	bl spruce, lab tea, peat moss
274	SA40	N	N	463133	6172546	KNS	TILL	10			Ae	0-10	SiL	Bt	45-90	С	ВС	90-120	CL				2-3	U	М	3	4	NE	MW	S0	М	j.pine alder, grass
275	SA41	N	N	462871	6172973	KNS	TILL	5			Ae	0-12	SiL	Bt	45-100	С	ВС	100-120+	CL				2-3	U	М	3	4	N	MW	S1	М	j.pine, fireweed, grass
276	SA42	N	N	462927	6172864	MRN	O TILL		Of	0-80	Ahg	80-90	CL	Bg	90-100	CL							1-2	L	М	2			Р	S0	М	bl spruce, lab tea, bog cran
277	SA43	N	N	480263	6201853	KNS	TILL	7			Ae	0-10	SiL	Bt1 Bt2	10-50 50-120+	CL CL							2-3	U	М	3	3	NE	MW	S0	М	j.pine, bl spruce, bog cran
278	SA44	N	N	480203	6202386	KNS	TILL	5			Ae	0-10	SiL	Bt1 Bt2	10-70 70-130+	SiCL CL							3-4	U	М	4	2	E	MW	S0	М	Bt2 is definitely till but the top 70cm could be Eolian or Lacustrine Overlay, j.pine, bl spruce, lab tea
279	SA45	N	N	480188	6203048	KNS	TILL				Ae	0-15	SiL	Bt	50-110	CL-C							2-3	U	М	3	3	N	MW	S1	М	bl spruce, lab tea, moss
280	SA46	N	N	480121	6203693	KNS	TILL	10			Ae	0-15	SiL	Bt	25-70	CL	BCg	70-110	CL				2	U	М	2	3	E	I	S0	М	bl spruce, moss, bunchberry
281	SA47	N	N	480759	6203707	KNS	TILL	15			Ae	0-30	SiL	Bt	30-80	CL	ВС	80-120	CL				3-4	U	М	4	4	S	MW	S0	М	bl spruce, j.pine, moss
282	SA48	N	N	481119	6203768	HLY	O TILL		Of	0-140				Bg	140-150	CL							1-2	L	E	2			VP	S0	М	bl spruce, tamarack, grass
283	SA49	N	N	481715	6203766	HLY	O TILL		Of	0-80				Bg	80-100	CL								L	E	2			Р		М	bl spruce, lab tea
284	SA50	N	N	482053	6203789	ALGpt	GLLC		Of	0-50	II Ahg	50-60	CL	Bg	60-80	CL								L	E	2			Р		М	bl spruce, lab tea, bog cran, moss
285	SA51	N	N	482613	6203830	ALGpt	GLLC		Of	0-50	Ahg	50-60	CL	Bg	60-80	CL	BCg	80-90	CL					L	E	2			Р	S0	М	bl spruce
286	SA52	N	N	483081	6203867	KNS	TILL	10			Ae	0-25	SiL	Bt	25-75	CL	ВС	75-100	CL				2-3	U	М	3	4	E	MW	S0	М	bl spruce, j.pine, moss, lab tea
287	SA53	Y	Υ	483731	6203918	KNS	TILL	8			Ae	0-20	SiL	Bt1 Bt2	20-50 50-80	CL L	ВС	80-110+	SL				2-3	U	М	3	4	NE	MW	S0	М	j.pine, lab tea, bl spruce
288	SA54	N	N	484143	6203519	KNS	TILL	15			Ae	0-20	SiL	Bt1	20-70	SiCL	ВС	70-110	CL				2-3	U	М	3	3	N	MW	S0	М	j.pine, bl spruce, moss

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope _ength	Aspect	Drainage	Surface Stoniness	Land Use	Comments
289	SA55	N	N	484426	6203269	KNS	TILL	12			Ae	0-25	SiL	Bt	25-60	SiCL	ВС	60-100	CL				2-3	U	М	3	3	s	MW	S0	М	bl spruce, aspen, j.pine
290	SA56	N	N	484171	6203947	KNS	GLLC/TILL		Of	0-20	Aeg	20-35	SiL	Btg	35-70	SiCL	II BCg	70-100	CL					L	E	2			Р	S0	М	j.pine, aspen, moss
291	SA57	N	N	484442	6203953	MRN	O TILL		Of	0-80	Ahg	80-90	L	Bg	90-120	CL							1-2	L	E	2			р	S0	М	bl spruce, lab tea, moss
292	SA58	N	N	485082	6204002	MRN	O TILL		Of	0-70	AhG	70-80	L	Bg	80-110	SiCL							1-2	L	E	2			Р	S0	М	bl spruce, lab tea, moss
293	SA59	N	Y	485477	6203919	LVK	GLLC TILL	8			Aegj	0-30	SiL	Btgjl II Bt	30-40 40-80	SiCL CL	ВС	80-120	CL				3	U	M-U	3	3	N	MW	S0	М	aspen, bl spruce, j.pine
294	SA60	N	N	485569	6204102	MUS	0		Of Om	0-160 160-220													4-5	U	L	4	3	N	VP	S0	М	bl. Spruce, tamrack, willow
295	SA61	N	N	485827	6204686	LVK	FLEO TILL	8			Ae	0-20	SiL	Bt	20-80	SiCL	ВС	80-95	CL				3	U	М	3	3	N	MW	S0	М	aspen, bl spruce, moss
296	SA62	N	N			LVK	FLEO TILL	8			Ae	0-25	SiL	Bt1 II Bt2	25-50 50-80	SiCL CL	ВС	80-100	CL				3	U	М	3	3	S	MW	S0	М	bl spruce, j.pine, moss
297	SA63	N	N	485767	6205178	LVK	FLEO TILL	7			Ae	0-22	SiL	Bt1 II Bt2	22-50 50-80	SiCL CL	ВС	80-100	CL				3	U	М	3	3	E	MW	S1	М	aspen, j.pine, bl spruce
298	SA64	N	N	486273	6204993	LVK	FLEO TILL	10			Ahe Ae	0-10 10-22	SiL SiL	II Bt	22-90	CL	ВС	90-110	CL				2-3	U	М	3	3	NW	MW	S1	М	birch, j.pine bl spruce
299	SA65	N	N	486595	6204653	LVK	FLEO TILL	20			Ae	0-30	SiL	Bt1 II Bt2	30-50 50-90	SiCL CL	ВС	90-110	CL				2-3	U	М	3	4	S	MW	S1	М	j.pine, bl spruce, aspen
300	SA66	N	N	487340	6203903	LVK	FLEO TILL	12			Ae	0-23	SiL	II Bt	23-70	CL-SCL	ВС	70-110	CL-SCL				2-3	U	М	3	3	NW	MW	S0	М	bl spruce, j.pine, moss
301	SA67	N	N	487863	6204052	LVK	FLEO TILL	8			Ae	0-30	SiL	Bt1 II Bt2	30-50 50-80	SiCL SCL	ВС	80-100	CL				3-4	U	С	3	4		MW	S0	М	birch, bl spruce, aspen
302	SA68	N	N	488532	6204047	HLY	O TILL		Of	0-100				Ву	100-110	CL							1-2	L	E	2	4		V	S0	М	bl spruce, birch, alder
303	SA69	N	N	488470	6204837	LVK	FLEO TILL	20			Ae	0-10	SiL	Bt1 II Bt	10-30 30-80	SiCL CL	ВС	80-100	CL				3	U	М	3	3	S	MW		М	j.pine, birch, aspen,bl spruce
304	SA70	N	N	487913	6204763	STPpt	TILL		Of	0-40				Bg	40-60	CL							6	U	D	6	3	S	VP	S0	W	alder, marsh grass
305	SA71	N	N	488081	6204781	KNS	TILL	4			Ae	0-20	SL	Bt	40-80	CL	ВС	80-100	SCL				2-3	U	С	3	3	SW	MW	S1	М	aspen, bl spruce, rose
306	SA72	N	N	489146	6204780	KNS	TILL	7			Ae	0-25	SL	Bt	25-80	CL	ВС	80-100	CL				2-3	U	М	3	4	W	MW	S1	М	bl spruce, aspen, moss
307	SA73	N	N	488523	6204563	LVKpt	FLEO TILL		Of	30-0	Ae	0-20	SiL	Bt	40-80	CL	BCgj	80-90	CL				3-4	U	L	4	3	N	MW	S1	М	bl spruce, moss, bunchberry
308	SA74	N	N	485779	6205602	LVK	FLEO TILL	25			Ahe Ae	0-5 5-25	SiL SiL	II Btgj	40-90	CL	ВС	90-100	CL				2-3	U	М	3	4	NW	MW	S0	М	j.pine, aspen, bl spruce
309	SA75	Y	Y	485712	6206191	LVK	FLEO TILL	10			Ahe Ae	0-3 3-40	SiL SiL	Bt1 II Bt2	40-80 80-110+	SCL CL							2-3	U	М	3	3	E	MW	S1	М	j.pine, aspen, bl spruce, silly putty Ae
310	SA76	N	N	485721	6207292	LVK	FLEO TILL	8			Ae	0-27	SiL	Bt1 II Bt2	27-45 45-80	SiCL SCL	ВС	80-110	CL				2-3	U	М	3	3	Е	MW	S1	М	j.pine, bl spruce, moss
311	SA77	N	N	485474	6207262	MRN	O TILL		Of	0-90				Bg	90-100	CL							1-2	L	E	2	4		VP	S0	М	bl spruce, mos, grass
312	SA78	N	N	484757	6207263	LVK	FLEO TILL	10			Ae	0-30	SiL	Bt1 II Bt2	30-50 50-70	SiCL CL	ВС	70-110+	CL				1-2	L	E	2	4		MW	S0	М	jackpine, bl spruce, moss
313	SA79	N	N	484257	6207272	HLY	O/GLLC		Of	0-80				Bg	80-100	SiL							1-2	L	E	2	4		VP	S0	М	bl spruce, grass
314	SA80	N	N	483649	6207273	ALG	GLLC		Of	0-40	Ahg Aeg	40-50 50-80	SiL SiL	Btg	80-100	CL							1-2	L	E	2	4		VP	S0	М	tamarack, bl spruce, alder
315	SA81	N	N	483186	6207286	HLY	O/GLLC		Of Oh	0-80 80-90				Bg	90-100	SiL							1-2	L	E	2	4		VP	S0	М	grasses, tamarack, bl spruce
316	SA82	N	N	482571	6207277	ALGpt	GLLC		Of Om	0-15 15-25	Ahg	25-30	SiL	Bg	30-80	SiCL								L	E	2			Р		М	lab tea, sphagnum, moss
317	SA83	N	N	481733	6207280	STP	TILL		Of	0-25				Bg	25++	CL							1-2	L	E	2	4		Р	S0	М	bl spruce, moss, lab tea
318	SA84	N	N	481383	6207305	ALG	GLLC TILL		Of	0-50	Ahg	50-60	SiL	Bg II Bg	60-80 80-100	SiL CL							1-2	L	E	2	4		Р	S0	М	bl spruce, moss, lab tea
319	SA85	N	N	480907	6207292	HLY	O/GLLC		Of Om	0-130 130150				Bg	150-170	SiL							1-2	L	E	2	4		VP	S0	М	bl spruce, grass
320	SA86	N	N	480580	6207100	LVK	GLLC TILL	25			Ae	25-40	SiL	Bt1 II Bt2	40-60 60-100	SiCL SCL							2-3	U	С	3	4		MW	S1	W	j.p bl spruce, tamarack

North American Kai Kos Dehseh SAGD Project
Volume 4, Appendix 9B

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
321	SA87	N	N	480225	6206880	LVK	GLLC TILL	5			Ae	0-25	SiL	Bt1 II Bt2	25-50 50-70	SiCL CL	BC	70-100	CL				2	L	М	2			MW	S1	М	j.pine, bl spruce, lab tea
322	SA88	N	N	479884	6206680	MRN	O/GLLC		Of	0-80			-	Bg	80-100	SiL							1-2	L	E	2	4		Р	S0	М	bl spruce, bog birch, grasses
323	SL1	N	N	472976	6185755	KNSzb	TILL	7-0			Ae	0-14	SiL	Bm Bt	14-35 35-100	CL CL								М	U	4	3	NW	MW	S1	W	aspen, rose, grass
324	SL2	N	N	471900	6185783	STPptzh	TILL		Of	30-0	Ahg	0-20	CL	Bg	20-70	CL								h	Е	2	4		Р	S0	В	bl spruce, lab tea, peat moss
325	SL3	N	N	471884	6185628	KNS	TILL	7-0			Ae	0-26	SiC	Bt	26-80	CL	ВС	80-100	CL					М	М	4	4	NNE	MW	S1	W	aspen, alder, rose
326	SL4	N	N	471811	6185526	HLY	O/GLLC		Of	0-130	Ah	130-140	CL							Cg	140-150	CL		L	E	2	4		VP	S0	В	bl spruce, willow, grass
327	SL5	N	N	471904	6185575	KNS	TILL	5-0			Ae	0-39	SiL	Bt	39-75	CL	ВС	75-100	CL					М	М	4	3	E	MW	S1	W	aspen, poplar, alder, rose
328	SL6	N	N	471941	6185613	KNS	TILL	5-0	-		Ae	0-25	SiL	Bt	25-80	CL	ВС	80-100	CL					М	М	4	ш	W	MW	S1	W	aspen, alder, rose
329	SL7	N	N	472047	6185642	KNS	TILL	5-0	-		Ae	0-30	SiL	Bt	30-85	CL	ВС	85-100	CL					М	U	4	4	W	MW	S1	W	aspen, alder, rose
330	SL8	N	N	472111	6185688	KNSzb	TILL	6-0			Ae	0-8	SiL	BM Bt	8-26 26-75	SiL CL	вс	75+	CL					М	М	4	4	NE	MW	S1	W	aspen, alder, rose
331	SL9	N	N	471950	6185558	KNSzb	TILL	7-0			Ae	0-11	SiL	BM Bt	11-25 25-80	L CL	ВС	80-100	CL					U	U	3	3	N	MW	S1	W	aspen, alder, rose
332	SL10	N	N	472057	6185562	KNSzb	TILL	9-0			Ae	0-10	SL	BM Bt	10-24 24-85	SL CL	ВС	85-100	SCL					R	U	6	1	E	MW	S1	W	aspen, alder, rose
333	SL11	N	N	472213	6185574	KNSzb	TILL	8-0			Ae	0-7	SL	BM Bt	7-27 27-85	SL CL	ВС	85-100	CL					М	М	4	3	ENE	MW	S1	W	aspen, alder, rose
334	SL12	N	N	472285	6185584	MLD	O/GLLC		Of	0-165										Cg	165-180	CL		h	М	2	5		Р	S0	В	burned - formerly bl spruce, lab tea
335	SL13	N	N	472169	6185662	KNSgl	TILL	12-0			Aeg	0-15	SL	Btgj	15-90	CL	вс	70-100	CL					U	Т	6	3	Е	I	S0	w	aspen, alder, rose
336	SL14	N	N	472193	6185740	KNS	TILL	7-0			Ae	0-20	SiL	Bt	20-70	CL	BC1 BC2	70-90 90+	SL CL					М	М	5	3	S	MW	S1	w	aspen, alder, rose
337	SL15	N	N	472382	6185746	KNSzb	TILL	6-0			Ae Ae	0-14 29-39	SiL	BM Bt	14-29 39-85	SiL CL	BC	85-100	CL					М	U	4	3	N	MW	S1	W	aspen, alder, rose
338	SL16	N	N	472379	6185723	KNSzb	TILL	4-0			Ae	0-10	SiL	BM Bt	10-25 25-55	CL	BC	55-100	CL					U	М	3	3	SE	MW	S0	W	aspen, alder, rose
339	SL17	N	N	472386	6185660	KNSptgl	TILL		Of	15-0	Aeg	0-12	SiCL	Btg	12-45	CL	BCg	45-100	CL					h	E	2	5		I	S0	В	bl spruce, lab tea
340	SL18	N	N	452380	6185771	LVKgl	GLFL/TILL	4-0			Ae1 Ae2	0-20 20-50	SL FSL	Btg	50-80	L				IIC	80-100	CL		U	Т	3	2	N	I	S1	W	aspen rose grass
341	SL19	N	N	472283	6185786	KNS	TILL	7-0			Ahe Ae	0-5 5-45	fSL SiL	Bt	45-100	CL								M-R	М	5	3	E	MW	S0	W	aspen, rose, alder
342	SL20	N	N	452186	6185775	KNS	TILL	6-0			Ae	0-30	SiL	Bt	30-65	CL	BC	65-100	CL					U	М	4	3	W	MW	S1	W	aspen rose grass
343	SL21	N	N	469482	6184783	DOVzb	GLLC		Of/Om	20-0	Ae	0-14	SiL	Bm Bt	14-44 44-90	SiL SiCL	ВС	90-100	SCL					U	U	3	3	SW	MW	S0	W	j.pine, wt spruce, moss
344	SL22	Y	Y	469342	6184745	LVK	GLFL/TILL		Of	14-0	Ae	0-10	SL	Bt	10-50	CL	BC	50-100	SL-SCL					U	М	3	4	S	MW	S0	W	aspen, j.pine, wt spruce
345	SL23	N	N	469230	6184737	MIL	GLFL		Of	12-0	Ae	0-11	SL	Bmj	11-31	L	BC	31-100	SL-LS					Н	U	5	2	W	W	S0	W	j.pine, wt spruce, rein lichen
346	SL24	N	N	469032	6184769	MILpt	GLFL		Of	22-0	Ae	0-6	SL	Bm	6-70	SL	BC	70-100	SL-SCL					R	М	7	2	W	R	S0	W	jackpine, bl spruce, lab tea
347	SL25	N	N	468896	6184760	MLD	0		Of	0-200														h	E	2	4		VP	S0	В	bl spruce, sedge, lab tea
348	SL26	N	N	468535	6184746	HLY	0		Of	0-60	Ah	60-75	L							Cz	75+	SL		d	E	2	5		MW	S0	В	Refusal due to permafrost @ 75 cm, bl spruce, lab tea, sphagnum
349	SL27	N	N	468469	6184757	MILxt	GLFL/TILL		Of	10-0	Ae	0-12	SL-LS	Bm	12-520	SL-LS	BC	50-90	SL-LS	IIC	90-100	CL		Н	М	5		S	R	S0	W	jackpine, bl spruce, lab tea
350	SL28	N	N	468449	6184724	MILxc	GLFL	8-0			Ae	0-9	SL-LS	Bm IIBt	9-50 50-80	SL-LS CL	BC	80-100	SL-LS					R	С	7	1	E	MW	S0	W	jackpine, rein lichen blueberry
351	SL29	N	N	470635	6183742	MLD	O/GLFL		Of	0-140										Cg	140+	SL		h	E	2	5		Р	S0	В	bl spruce, lab tea, tamarack
352	SL30	N	N	470673	6183747	MIL	GLFL	3-0			Ae	0-6	LS	Bm	6-40	LS	ВС	40-100	SL					U	М	4	3	NE	R	S0	W	j.pine, lichen, wt spruce

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture % Slop	Surfa	Slope Sosition (Slope Slo		ct Drainag	Surface Stoniness	Land Use	Comments
353	SL31	N	N	470681	6183801	MLD	0	(cm)	Of	0-200								(cm)					h	Е	2 5		Р	S0	В	bl spruce, lab tea, sphagnum
354	SL32	N	N	470728	6183810	BTMpt	GLFL		Om	30-0	Aeg	0-40	LS	Btg	40-70	SL							L	E	2 5		P	S0	В	bl spruce, lab tea, feather moss
355	SL33	N	N	470777	6183791	MRN	0		Om Oh	35-10 10-0										Cg	0-110	SL	L	E	2 4		Р	SO	В	bl spruce, lab tea, bog cran
356	SL34	N	N	470775	6183729	HLY	O/GLFL		Of Om Oh	0-25 25-50 50-65	Ah	65-80	L							Cg	80-100	SL	h	Е	2 5		Р	S0	В	bl spruce, willow, feather moss
357	SL35	N	N	470768	6183671	MLD	O/GLLC		Of	0-210										Cg	210-220	CL	h	Е	2 5		Р	S0	В	bl spruce, tamarack, lab tea
358	SL36	N	N	470840	6183673	MLD	0		Of	0-220													h	Е	2 4		Р	S0	В	bl spruce, lab tea, sphagnum
359	SL37	N	N	470719	6183674	MLD	0		Of	0-200													h	Е	2 4		Р	S0	В	bl spruce, lab tea, sphagnum
360	SL38	N	N	470606	6183682	HLY	O/GLFL		Of	0-75										Cg	75-100	SL	h	Е	2 4		Р	S0	В	bl spruce, lab tea, sphagnum
361	SL39	N	N	469956	6181607	HLY	O/GLFL		Of Om	0-60 60-135										Cg	135-150	SCL	h	Е	2 4		VP	S0	В	bl spruce, lab tea, sphagnum
362	SL40	N	N	469920	6181602	MIL	GLFL/GLLC	1-0			Ae	0-8	SL	BM1 BM2	8-23 23-55	SL				IIC	55+	CL	R	С	6 1		MW	S0	W	j.pine, rein lichen, moss
363	SL41	N	N	469868	6181644	MLD	0		Of	0-200													h	Е	2 5		VP	S0	F	bl spruce, lab tea, larch
364	SL42	N	N	469820	6181651	MLD	0		Of	0-200													h	Е	2 5		VP	S0	F	tamrack, bl spruce, bog cran
365	SL43	N	N	469753	6181654	MIL	GLFL	1-0			Ae	0-8	LS	Bm	8-60	LS	ВС	60-100	LS-S				R	М	4 1	E	R	S0	W	j.pine, grass
366	SL44	N	N	ot on datashee	et	HLY	0		Of	0-175										Cg	175-190	SL	h	E	2 4		Р	S0	В	burned - formerly bl spruce, lab tea
367	SL45	N	N	469765	6181587	MLD	0		Of	0-200													h	E	2 5		VP	S0	F	tamarack, bl spruce, bog birch
368	SL46	N	N	469829	6181567	HLY	O/GLLC		Of	0-70										Cg	70-100	С	h	Е	2 5		Р	S0	В	burned - formerly bl spruce, lab tea
369	SL47	N	N	469886	6181590	MIL	O/GLFL		Of	0-15				Bm	15-55	CL	BCg	CL					М	Т	5 1		ı	S0	W	j.pine, wt spruce, lab tea
370	SL48	N	N	469906	6181591	MIL	GLFL	2-0			Ae	0-12	LS	Bm	12-40	LS	ВС	40-50	LS				R	С	5 1	N	R	S0	W	j.pine, wt spruce, rein lichen
371	SL49	N	N	485435	6203269	DOVzb	GLLC		Of	13-0	Ae	0-8	SiL	Bm Bt	8-38 38-68	SiL CL	ВС	68-100	SL-SCL				U	М	3 3	sw	w	S0	W	j.pine, wt spruce, aspen
372	SL50	N	N	485376	6203340	KNSxc	GLLC/TILL		Oh	14-0	Ae	0-10	SiL	Bm Bt	10-35 35-65	SiL CL	IIC	65-100	CL				U	М	2 4	S	W	S0	W	j.pine, wt spruce, aspen
373	SL51	N	N	485349	6203434	KNS	GLLC TILL/GLFL		Of	17-0	Ae	0-4	SiL	Bm IIBt	4-60 60-75	SiL-SCL CL	IIIBC	75-100	SL				U	М	2-3 4	s	MW	S0	W	j.pine, birch, moss
374	SL52	N	N	485327	3203602	KNSptglxc	GLLC/TILL		Of	40-0	Ahe Ae	0-7 7-11	SiL SiL	Bm Btg	11-50 50-90	SiL CL				IIC	90-100	CL	L	Е	2 4		MW	S0	W	j.pine, aspen, wt spruce
375	SL53	N	N	485313	6203763	HLY	O/GLLC		Of	0-80										Cg	80-100	SiC	h	Е	2 4		P	S0	В	bl spruce, lab tea, feather moss
376	SL54	N	N	485225	6203683	HLY	O/GLLC		Of Oh	0-90 90-100										Cg	100-120	С	h	Е	2 4		P	S0	В	bl spruce, lab tea, feather moss
377	SL55	N	N	485222	6203765	MLD	0		Of	0-160													h	Е	2 4		P	S0	В	bl spruce, lab tea, feather moss
378	SL56	N	N	485219	6203604	STPptzrxc	GLLC/TILL		Of	20-0	Ah	0-4	SiL							Cg IICg	4-60 60-100	SiCL CL	L	Е	2 4		Р	S0	W	j.pine, wt spruce, lab tea, feather moss
379	SL57	Y	Y	485204	6203513	KNSxc	GLLC/TILL		Of	8-0	Ah Ae	0-2 2-10	L SiL	Bm Bt	10-25 25-55	SiL CL				IIC	55-100	SCL	U	М	2-3 4	NW	MW	S0	W	Till indicators in IIC, aspen, st spruce, feather moss
380	SL58	N	N	485074	6203692	KNSptxc	GLLC/TILL		Of	25-0	Ah Ae	0-4 4-12	SiL SiL	Btg	12-60	CL				IICg	60-100	SCL	U	М	2-3 4			S0	W	j.pine , aspen, wt spruce
381	SL59	N	N	485054	6203596	KNSptglxc	GLLC/TILL		Of	20-0	Aeg	0-20	SiL	Btgj	20-60	CL				IICg	60-100	CL-SCL	U		3 3	NW	MW	S0	W	j.pine , aspen, wt spruce
382	SL60	N	N	485043	6203442	KNSpt	TILL		Of/m	19-0	Aeg	0-35	SiL	Btg	35-65	CL	BCg	65+	CL-SCL		60.100		U	М	2-3 4	S	D	S0	W	j.pine , aspen, wt spruce
383	SL61	N	N	485066	6203328	MILxcxt	GLFL/TILL	10	 Of	0-160	Ae	0-17	SiL	Bm	17-60	SiL				IIC	60-100 100-120	SL CL	U		3 4	S		S0	W	aspen, birch, poplar
384	SL62	N	N	484140	6204717	MLD	O/GLLC		Of Oh	0-160 160-180										Cg	180-200	С	h	Е	2 5		Р	S0	В	60m easting shift, bl spruce, tamrack, bog birch

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Dept (cm)	h A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
385	SL63	N	N	484111	6204817	MLD	O/GLLC		Of Oh	0-160 160-180										Cg	180-200	С		h	Е	2	4		Р	S0	В	bl spruce, tamrack, bog birch
386	SL64	N	N	484133	6204864	HLY	O/GLLC		Of	0-90										Cg	90-100	С		h	E	2	4		Р	S0	В	bl spruce, tamrack, bog birch
387	SL65	N	N	484137	6205013	MRN	O/GLLC		Of Om Oh	0-40 40-90 90-110										Cg	110-120	С		h	E	2	4		Р	S0	В	bl spruce, tamrack, bog birch
388	SL66	N	N	484116	6205202	KNSptglxcxs	GLLC/ GLFL/TILL		Of Oh	23-13 13-0	Ae	0-3	SiL	Bt	3-55	SiCL				IICg IIIC	55-95 95-100	SL CL		L	E	2	3		MW	S0	W	bl spruce, j.pine, blueberry
389	SL67	N	N	484139	6205375	HLY	O/GLLC		Of Oh	0-60 60-75										Cg	75-100	С		h	E	2	4		Р	S0	В	bl spruce, lab tea, sphagnum
390	SL68	N	N	484231	6205710	ALGptzrxs	GLLC GLFL/GLLC		Of	40-0	Ah	0-10	CL							Cg IICg Cg	10-55 55-85 85-100	CL SL CL		h	E	2	4		Р	S0	В	bl spruce, lab tea, feather moss
391	SL69	N	N	484235	6205833	HLY	O/GLLC		Of	0-75										Cg	75-100	CL		h	E	2	4		Р	S0	В	bl spruce, lab tea, willow
392	SL70	N	N	481434	6204648	MKWaa	0		Of Ohz	0-60 60-80														d	Е	2	4		Р	S0	В	Auger refusal @ 80cm permafrost, bl spruce, lab tea, bog birch
393	SL71	N	N	481302	6204380	KNSxc	GLLC/TILL		Of	11-0	Ae	0-4	SiL	Bm Bt	4-12 12-70	SiL SiCL				IIC	70-100	CL		U	М	2	4	E	MW	S0	W	wt spruce, jackpine, bog birch
394	SL72	N	N	481252	6204407	KNSptxc	GLLC/TILL		Of	19-0	Ae	0-3	SiL	Bt	3-75	SiCL				IIC	75-100	CL		U	U	2	3	NW	MW	S0	W	bl spruce, jackpine, feather moss
395	SL73	N	N	480976	6205732	MKWaa	0		Of Ohz	0-55 55-100														d	Е	2	4		Р	S0	В	bl spruce, lab tea, bog cran
396	SL74	N	N	480958	6206177	MKWaa	0		Of	0-85										Cz	85-100	frozen		Н	е	2	5		Р	S0	В	bl spruce, lab tea, rein lichen
397	SL75	N	N	480913	6206653	HLY	O/GLLC		Om	0-90										Cg	90-110	С		h	E	2	4		Р	S0	В	bl spruce, lab tea, bog cran
398	SL76	N	N	478352	6206147	MLD	0		Of	0-220														h	E	2	4	-	Р	S0	F	bl spruce, tamarack, bog birch
399	SL77	N	N	481	6206248	MLD	0		Of	0-200														h	E	2	4		VP	S0	F	bl spruce, tamarack, bog birch
400	SL78	N	N	695	6205744	STPpt	TILL		Of	27-0	Ah Aeg	0-3 3-7	SiL SiL	Btg	7-65	CL	BCg	65+	CL					L	E	2	4		Р	S0	WB	bl spruce, lab tea, tamarack
401	SL79	N	N	481697	6205629	STPpt	TILL		Of	14-0	Ahe	0-14	SiL-SiCL	Btg	14-80	CL	BCg	80-100	CL					L	Е	2	4		Р	S0	В	bl spruce, lab tea, tamarack
402	SL80	N	N	481698	6206160	HLY	O/GLLC		Of Oh	0-70 70-85										Cg	85-120	С		d	E	2	4		Р	S0	В	bl spruce, lab tea, bog cran
403	SL81	N	N	481693	6206357	MKWaa	0		Of Om Ohz	0-30 30-75 75-95														d	Е	2	4		Р	S0	В	bl spruce, lab tea, bog cran
404	SL82	N	N	480947	6209607	HLY	O/GLLC		Of	0-75										Cg	75-100	С		h	Е	2	5		VP	S0	В	bl spruce, lab tea, bog cran
405	SL83	N	N	481000	6209605	DOVzb	GLLC		Of	12-0	Ae	5-15	SiL	Bm Btj Bt	0-5 15-60 60-100	SiL SiCL C								L	М	2	4	W	MW	S0	W	bl spruce, feather moss, j.pine
406	SL84	N	N	481054	6209612	ALGpt	GLLC		Of	20-0				Bg	0-30	CL	BCg	30-100	С					U	М	2	4	SW	Р	S0	W	bl spruce, feather moss, lab tea
407	SL85	N	N	481101	6209615	ALGpt	GLLC		Of	37-0										Cg	0-63	С		L	E	2	4		Р	S0	W	bl spruce, feather moss, lab tea
408	SL86	N	N	481157	6209609	MKWaa	O/GLLC		Of Oh	0-50 50-70										Cz	70-100			d	E	2	4		Р	S0	В	bl spruce, feather moss, lab tea
409	SL87	N	N	481152	6209507	HLY	O/GLLC		Of	0-140										Cg	140-150	С		h	E	2	4		VP	S0	BF	tamarack, bl spruce, bog birch
410	SL88	N	N	481112	6209523	HLY	O/GLLC		Of Oh	0-110 110-130										Cg	130-140	С		h	Е	2	4		VP	S0	BF	tamarack, willow, bog birch
411	SL89	N	N	481037	6209534	HLY	O/GLLC		Of Oh	0-75 75-110										Cg	110-120	С		h	E	2	4		Р	S0	F	tamarack, willow, bog birch
412	SN1	N	N	480719	6206629	HLY	TILL		Of Om	0-30 30-80	Ahg	80-90	CL	Bg	90++	CL							1-2	L	L				VP	S0	М	bl spruce, bog birch, sedge
413	SN2	N	N	481184	6206225	STPptxs	FLEO TILL		Of	0-40	Aeg	40-60	SiL	Bg	60-70	CL	II BCg	70-100+	SCL				1-2	L	L				VP	S1	М	bl spruce, lab tea, sphagnum
414	SN3	N	N	481522	6205937	MLD	0		Of	0-220													1-2	L	D				VP	S0	М	bl spruce, tamrack, sedge
415	SN4	N	N	481916	6205546	STPpt	TILL		Of	0-45				Bg	45-110+	CL							1-2	L	L				VP	S0	М	bl spruce, tamrack, sphagnum
416	SN5	N	N	482379	6205150	MRN	O TILL		Of Om	0-80 80-90				Bg	90++	CL							1-2	L	L				VP	S0	М	bl spruce, sedge, lab tea

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
417	SN6	Y	Υ	482803	6204797	HLY	O/GLFL		Oh	0-65	Ahg	65-95	L	Bg	95-120	CL-SCL							1-2	L	D				VP	S0	М	bl spruce, alder, willow
418	SN7	N	N	483189	6204410	вмт	GLFL		Of Oh	0-30 30-50				Bg	50-60	SiCL	II BCg	60-120+	SCL-CL				1-2	L		4	4		Р	S0	М	bl spruce, tamarack, moss
419	SN8	N	N	483434	6204203	LVK	FLEO TILL		Of	12-0	Aegj	0-18	SiL	Bt1 II Bt	18-38 38-65	SiCL SCL	вс	65-100	SCL				2-3	U	М	4	4	SE	MW-I	S0	w	j.pine, bl spruce, aspen
420	SN9	N	N	483738	6203922	FORT	FLEO/GLFL		Of	12-0	Ae	0-10	SiL	Bt II Bt2	19-35 35-85	SiCL SCL	II BC	85-100	SL				1-2	L	L				MW-I	S0	w	j.pine, bl spruce, sphagnum
421	SN10	N	N	484177	6203490	FORT	FLEO/GLFL		Of	0-40	Ae	40-50	SiL	Bt	65-80	SiCL	BC II BC	80-90 90-120	SiCL SL				1-2	L	L				MW-I	S0	w	aspen, j.pine, bl spruce
422	SN11	N	N	484180	6204142	MUS	O TILL		Of	0-210				Bg	120++	SiCL							1-2	L	М	2	4		VP	S0	М	bl spruce, lab tea, moss
423	SN12	N	N	484186	6204428	MUS	0		Of	0-220														L	L				VP	S0	М	sedge, tamarack, bl spruce
424	SN13	N	N	484198	6204973	MUS	O TILL		Of Om	0-170 170-220				Bg	220+	SiCL							1-2	L	L			-	VP	S0	М	bl spruce, tamarack, willow
425	SN14	N	N	484729	6205208	LVKzb	GLFL/TILL		Of	15-0	Ae	0-15	SiL	Bm Bt	15-22 22-80	LS SCL	вс	80-120++	CL-SCL				3	U	М	3	3	N	MW	S0	М	j.pine, bl spruce, moss
426	SN15	N	N	485350	6205168	FORT	FLEO/GLFL		Of	17-0	Ae	0-11	SiL	II Bt	30-45	SCL	II BC	45-120+	SL				3-4	U	М	3	3	NW	MW	S1	М	bl spruce, j.pine, moss
427	SN16	N	N	486316	6204937	FORT	GLFL	12			Ahe Ae	0-5 5-30	SiL SiL	II Bt	30-80	SCL	ВС	80-100+	SCL				2-3	U	М	3	3	Е	MW	S1	w	aspen, bl spruce, fireweed
428	SN17	N	N	475707	6226491	MUS	0		Of	0-220+													1-2	L	М	2	4		Р	S0	М	bl spruce, lab tea, moss
429	SN18	N	N	475700	6225767	KNSpt	TILL		Of	16-0	Ae	0-6	SiL	Bt	6-60	SiCL	ВС	60-110	CL				3-4	U	М	3	3	NW	Р	S0	W/M	bl spruce, sphagnum, lab tea
430	SN19	N	N	475737	6224912	MRN	O TILL		Of Om	0-70 70-120	Ahg Aeg	120-125 125-130	SiL SiL	Bg	130++	CL							2-3	U	М	3	3	Е	Р	S0	М	bl spruce, lab tea, moss
431	SN20	N	N	475162	6224909	KNSpt	TILL		Of	25-0	Ae	0-10	SiL	Bt	20-60	SiC	ВС	60-110+	CL				2-3	U	M - U	4	4	Е	MW-I	S0	w	bl spruce, lab tea, moss
432	SN21	N	N	474739	6224892	MUS	O TILL		Of	0-180				Bg	180-190	SiCL								L	L				VP	S0	М	bl spruce, lab tea, sphagnum
433	SN22	N	N	474001	6224852	STPpt	TILL		Of	0-30	Aeg	30-65	SiL	Bg	65++	SiCL							1-2	L	L				VP	S0	W/M	bl spruce, lab tea, carex
434	SN23	N	N	473729	6224868	MLD	0		Of	0-220													1-2	L	М	4	4		VP	S0	М	bl spruce, sedge grass
435	SN24	N	N	473455	6224849	MUS	O TILL		Of	0-180				Bg	180++	CL							1-2	L	М	2	4		VP	S0	М	bl spruce, sedge grass, moss
436	SN25	N	N	472890	6224820	KNS	FLEO TILL		Of	20-0	Ae	0-11	SiL	Bt	20-42	SiCL	ВС	42-110+	CL				3-4	U	М	3	3	E	MW	S1	W	bl spruce, moss, lab tea
437	SN26	N	N	472155	6224819	STP	GLFL/TILL		Of	50-0	Aheg	0-15	SiCL	Btg 2	15-70	SiCL	II BC1 BC2	70-100 100-120	SCL CL				2-3	U	М	4	4	Е	I-P	S1	W	bl spruce, lab tea, moss
438	SN27	N	N	472188	6225423	KNSpt	TILL		Of	20-0	Ae	0-5	SiL	Bt	5-45	SiCL	ВС	45-110+	CL				4-5	U	М	3	3	NW	W-MW	S0	w	bl spruce,j.pine, moss
439	SN28	N	N	472273	6226178	MLD	0		Of	0-220													L & 6	L-I	Т	2			VP	S0	W	bl spruce, carex, bog birch
440	SN29	N	N	472730	6226207	KNSpt	TILL		Of	22-0	Ae	0-8	SiL	Bt	18-70	SiCL	ВС	70-					5-6	R	С	1	1	E-W	MW-W	S1	W	bl spruce, j.pine, moss
441	SN30	N	N	473697	6226264	STP	TILL		Of	0-40	Ahg Ae	40-50 50-60	SiL SiL-SiCL	Bt	60-100	SiC	BC	100-120	CL				3-4	R	M - L	1	1	W	MW	S0	W	bl spruce, lab tea, moss
442	SN31	N	N	474260	6225777	KNSpt	TILL		Of	20-0	Ae1 Ae2	0-8 8-18	SiL SiL	Bt	18-50	SiC-SiCL	ВС	50-100	CL				4-5	U	М	3	3	S	MW	S0	W	bl spruce, moss
443	SN32	N	N	474936	6226315	KNSpt	TILL		Of	20-0	Ahe Ae	0-4 4-19	SiL	Bt	19-45	SiCL	ВС	45-90	CL				4-5	R	U	2	2	SE	MW	S0	W	aspen, bl spruce, j.pine
444	WKH1	Y	Y	471152	6184510	MLD	0		Of	0-220														h	E	2			VP	S0	F	sedge, bog birch, moss
445	WKH2	N	N	471160	6184629	MLD	0		Of Of	0-220														h	E	2			VP	S0	F	willow, bog birch, moss
446	WKH3	N	N	471239	6184916	HLY	O/GLFL O		Oh Of	80-100	Aheg	100-120	SL											h	E	2			VP	S0	F	sedge, willow, tamarack
447	WKH4	N	N	471371	6185125	HLY	GLLC		Oh	80-100				Bg	100-120	CL								h	E _	2			VP	S0	F _	willow, moss,sedge
448	WKH5	N	N	471418	6185418	HLY	GLFL/GLLC		Of	0-70				Bg	70-100	SL	BCg	100-120	CL					h	Е	2			VP	S0	F	Burn area, sedge, grass, moss

North American Kai Kos Dehseh SAGD Project
Volume 4, Appendix 9B

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position		lope ength	Aspect	Drainage	Surface Stoniness	Land Use	Comments
449	WKH6	Υ	Υ	471522	6185676	LVK	GLFL/TILL		Of	5-0	Ae	0-5	LS	Bt	5-46	SCL				Ck	46-120	SCL		U-I	M-U	2	3	W	MW	S0	WF	Rocks @ 80cm; burn area, bl spruce, blueberry, tamarack
450	WKH7	N	N	471645	6185758	MLD	0		Of	0-220														h	U	2	3	3	Р	S0	F	burn area, bl spruce, blueberry, tamarack
451	WKH8	N	N	471813	6185631	KNS	TILL		Of	2-0	Ae	0-18	FSL	Bt	18-45	SCL	вс	45-120	CL					M-I	М	2-3	3	4	MW	S1	W	burned area, aspen, pine, fireweed
452	WKH9	N	N	471696	6185464	KNS	TILL	4-0			Ae	0-10	FSL	Bt	10-43	SCL	ВС	43+	CL					М	U	3	5	2	MW	S0	W	aspen, pine, fireweed
453	WKH10	N	N	471690	6185599	KNS	TILL	4-0			Ae	0-17	L	Bt	17-50	CL	ВС	50-120	CL					М	М	3	3	2	MW	S0	W	burned area,grass, aspen, moss
454	WKH11	N	N	471595	6185632	KNSzb	TILL		Of	2-0	Ae	0-8	SL	BM Bt	8-18 18-52	SCL SCL	ВС	52-65	CL					М	E	3-4	2	4	MW	S0	W	burned area, horsetail, fireweed
455	WKH12	N	N	471667	6185840	KNS	TILL		Of	4-0	Ae	0-6	FSL	Bt	6-55	SiCL	ВС	55-120	CL					М	E	3	2	5	MW-W	S0	W	burned area, pine, bl spruce, lab tea
456	WKH13	N	N	471885	6185725	KNS	TILL	4-0			Ae	0-6	FSL	Bt	6-52	CL	ВС	52-120	CL					М	М	4	5		MW	S0	W	aspen, wt spruce, bunchberry
457	WKH14	N	N	469900	6184735	HLY	O/GLFL		Of Oh	0-20 20-70				Bg	70-83	SL	BCg	83-120	S					h	E	2			Р	S0	В	bl spruce, lab tea, moss
458	WKH15	Y	Y	470116	6184763	MKWaa	O/GLFL		Of Omz	0-20 20-75							BCg	75-120	SCL					h	E	2			VP	S0	F	bl spruce, lab tea, moss
459	WKH16	Y	Y	470339	6184748	MIL	GLFL		Of	10-0	Ae	0-6	S	Bm	6-14	S	ВС	14-120	SL					L	E	2			VP	S0	В	bl spruce, lab tea, pine, SIDE OF ESKER
460	WKH17	N	N	470590	6134763	BTMpt	GLFL		Of	25-0				Bg	0-10	SL	ВС	10-95	LS					U	М	2-3	3	S	Р	S0	В	bl spruce, moss, lab tea
461	WKH18	N	N	470810	6184734	MIL	GLFL	6			Ae	0-8	LS	Bm	8-?	LS	ВС	?-120	S					R	М	3	4	NE	R	S0	w	pine, rein lichen, blueberry
462	WKH19	N	N	470036	6182419	HLY	O/GLFL		Of	0-90				Bg	90-120	SL								h	E	2			VP	S0	F	bl spruce, leather leaf, sedge
463	WKH20	N	N	470043	6182517	MLD	0		Of Ofz Of	0-50 50-80 80-220														h	E	2			VP	S0	В	bl spruce, lab tea, lowbush cran
464	WKH21	N	N	470146	6182499	BTMpt	GLFL		Of	35-0				Bg	0-85	SCL-SL								L	E	2			VP	S0	В	bl spruce, moss, sedges
465	WKH22	N	N	470222	6182494	MIL	GLFL	4-0			Ae	0-9	SL	Bm	9-23	S	ВС	23-120	S					R	М	2-3	2	Е	R	S0	W	pine, rose, moss, lab tea
466	WKH23	N	N	470215	6182404	MLD	0		Of	0-220														h	E	2			VP	S0	F	bl spruce, lab tea, sedges
467	WKH24	N	N	470130	6182401	HLY	O/GLFL		Of	0-80				Bg	80-120	SCL								h	E	2			VP	S0	F	tamarack, bl spruce, lab tea
7	WKH25	N	N	470162	6182463	MIL	GLFL		Of	3-0	Ae	0-10	S	Bm	10-25	S	ВС	25-120	S					R	М	4	1-2	W	R	S0	W	Esker, pine, bl spruce, lab tea
469	WKH26	N	N	470270	6181667	LVK	GLFL/TILL	4-0			Ae	0-10	S	Bt	10-47	SCL	ВС	47-120	CL					R	М	2-3	2	NE	W-R	S0	W	pine, bl spruce, lab tea
470	WKH27	N	N	470422	6181645	MILpt	GLFL		Of	0-20	Ae	20-33	S	Bm	33-42	S	ВС	42-120	S					L	E	2			VP	S0	В	bl spruce, lab tea, rein lichen
471	WKH28	N	N	470543	6181627	MLD	0		Of	0-220														h	E	2			VP	S0	F	tamarack, bl spruce, sedge
472	WKH29	N	N	470545	6181514	HLY	O/GLLC		Of Om	0-21 21-85							BC	85-120	CL					h	E	2			VP	S0	В	bl spruce, willow, sedge
473	WKH30	N	N	470453	6181561	LVKzb	GLFL/TILL		Of	9-0	Ae	0-8	S	Bm Bt	8-18 18-28	S SCL S	BC	28-120	CL					U	М	2	2-3	N	W	S0	W	bl spruce, pine, lab tea
474	WKH31	N	N	470368	6181573	LVKzb	GLFL/TILL	2-0			Ae	0-8	LS	Bm Bt	8-22 22-56	SCL	BC	56-120	CL					R	М	3	1-2	S	W	S0	W	pine, bl spruce, lab tea
475	WKH32	N	N	470343	6181506	LVKgI	GLFL/TILL		Of	5-0	Ae	0-15	SL	Bt	15-27	CL	BCg	27-120	CL					U	М	1-2	4	SE	Р	S0	W	pine, bl spruce, lab tea
476	WKH33	N	N	485668	6207201	LVKzb	GLFL/TILL		Of	4-0	Ae	0-9	SL	Bm Bt	9-26 26-34	SL CL	BC	34-120	CL					L	E				VP	S0	BW	pine, bl spruce, lab tea
477	WKH34	N	N	485630	6207101	HLY	O/GLFL		Of	0-50				Bg	50-65	SiCL	BCg	65+	SL					h	E	2			VP	S0	В	bl spruce, lab tea, moss
478	WKH35	N	N	485813	6207073	STPpt	TILL		Of	15-0	 Ahe	45-51	SiL	Bg	0-20	SCL	ВС	20-120	CL					h	E	2			VP	S0	В	bl spruce, lab tea, moss
479	WKH36	N	N	485852	6207197	HLY	O/TILL		Of	0-45	Aeg	51-71	L	Bg	71-120	SCL								h	E				VP	S0	В	bl spruce, lab tea, moss
480	WKH37	N	N	484628	6203430	KNS	TILL	5			Ae	0-22	L	Bt	22-32	SCL	BC	32+	CL					U-H	M-E	1-2	4-5	S	MW	S0	W	bl spruce, aspen, moss

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position	Slope Class	Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
481	WKH38	N	N	487765	6203422	KNS	TILL		Of	10-0	Ae	0-15	L	Bt	15-51	CL	ВС	51+	SCL					U-H	M-E	1-2	3	NW	Р	S0	W	bl spruce, j.pine, aspen, moss
482	WKH39	N	N	484894	6203290	MIL	GLFL	6			Ae	0-17	L	Bm	17-42	SL	ВС	42-120	S					U	М	2	4	S	R	S0	W	bl spruce, j.pine, aspen, moss
483	WKH40	N	N	484791	6203281	MILxt	GLFL/TILL	6			Ae	0-15	L	Bm	15-52	S	ВС	52+	SCL					U	М	2	4	SW	MW	S0	W	aspen, wt spruce, fireweed
484	WKH41	N	N	484965	6203210	MILxt	GLFL/TILL	6			Ae	0-14	SL	Bm	14-40	LS	ВС	40-45	SCL					U	D	2	3-4	S	MW	S0	W	Auger refusal @ 45cm, aspen, wt spruce, moss
485	WKH42	N	N	484999	6203347	KNS	TILL	5			Ae	0-12	L	Bt	12-45	SCL	ВС	45-120	CL					U-I	М	2-3	4	S	MW	S0	W	birch aspen, wt spruce
486	WKH43	N	N	484969	6203511	KNSpt	TILL		Of	16-0	Ae	0-24	L	Bt	24-50	CL	ВС	50-120	CL					U	М	2	4	NE	MW	S0	W	pine, aspen, moss
487	WKH44	N	N	484908	6203567	HLY	O/TILL		Of	0-50	Ahe Ae	50-56 56-66	L	Bg	66-120	CL					-			h	E	2			VP	S0	В	bl spruce, lab tea, moss
488	WKH45	N	N	484757	6203630	KNS	TILL		Of	10-0	Ae	0-24	L	Bt	24-45	CL	ВС	45-120	CL					U	М	2	4	NW	MW	S0	W	pine, aspen, moss
489	WKH46	N	N	484581	6203701	HLY	O/TILL		Of Om	0-30 30-80				Bg	80-120	CL								h	E	2			VP	S0	F	tamarack, bl spruce, sedge
490	WKH47	N	N	484659	6203804	MLD	0		Of	0-220														h	E	2			VP	S0	В	bl spruce, lab tea, moss
491	WKH48	Y	Y	484834	6203798	ALGpt	GLLC		Of	20-0							BCg	0-120	С					h	E	2			VP	S0	WB	poplar wt spruce, moss, rose
492	WKH49	N	N	484918	6203722	KNSpt	TILL		Of	15-0	Ae	0-14	L	Bt	14-52	CL	ВС	52-120	CL					U	М	2	4	SE	MW	S0	W	pine, spruce, aspen, moss, lab tea
493	WKH50	N	N	486229	6205159	KNS	TILL	8-0			Ae	0-24	L	Bt	24-48	SCL	ВС	48-120	CL					U	М	2	4	Е	MW	S0	W	aspen, pine, poplar, fireweed
494	WKH51	N	N	485873	6205022	KNS	TILL	10-0	Of	10-0	Ae	0-7	SiL	В	7-55	CL	ВС	55-120	CL					U	М	2	4	SE	MW	S0	W	wt spruce, aspen, pine
495	WKH52	N	N	485890	6205315	KNS	TILL/GLFL		Of	13-0	Ae	0-18	SiL	Bt	18-55	CL	ВС	55-120	LS					U	М	2	4	S	MW	S0	W	wt spruce, aspen, pine
496	WKH53	N	N	482555	6204100	MLD	0		Of	0-220														h	E	2			VP	S0	F	tamarack, bl spruce, sedge
497	WKH54	N	N	483458	6205050	MLD	0		Of Om Of	0-80 80-200 0-70														h	E	2			VP	S0	F	tamarack, willow, sedge
498	WKH55	N	N	483437	6204824	MLD	0		Om Oh	70-180 180-200														h	E	2			VP	S0	F	tamarack, willow, bl spruce
499	WKH56	N	N	483437	6204590	HLY	TILL		Of Om	0-30 30-60							ВС	60-120	С					h	E	2			VP	S0	В	bl spruce, moss, lab tea
500	WKH57	N	N	482532	6205746	HLY	0		Of Om	0-30 30-65				Bg	65+	CL								h	E	2			VP	S0	В	bl spruce, moss, sedge
501	WKH58	N	N	482532	3205865	HLY	0		Of Of	0-100				Bg	100-120	С								h	E	2			VP	S0	F	bl spruce, tamarack, sedge
502	WKH59	N	N	482527	6206037	HLY	O/TILL		Om Of	0-50 50-70				Bg	70-120	С								h	E	2			VP	S0	В	bl spruce, willow, sedge
503	WKH60	N	N	482536	6206269	MKWaa	0		Ofz Of	40-60														h	E	2			VP	S0	В	Frozen @ 60cm, bl spruce, lab tea, moss
504	WKH61	N	N	482536	6206530	HLY	O/TILL		Om	40-80				Bg	80-120	С								h	E	2			VP	S0	В	bl spruce, lab tea, moss
505	WKH62	N	N	482542	6206659	HLY	O/GLFL		Of Of	0-110							ВС	110-120	SL					h	E _	2			VP	S0	В	bl spruce, lab tea, moss
506	WKH63	N	N	481990	6207167	MLD	0		Om	100-200														h	E	2			VP	S0	В	bl spruce, lab tea, moss
507	WKH64	N	N	481739	6207215	HLY	O/TILL		Of Of	0-50							BCg	50-120	C .					h	-	2			VP	S0	В	bl spruce, lab tea, moss
508	WKH65 WKH66	N N	N N	481685 480959	6206727 6209526	HLY STPpt	O/TILL TILL		Om Oh Of	50-90 90-120 30-0							BCg	120-130 0-120	C CL					h	E	2			VP VP	\$0 \$0	В	bl spruce, lab tea, moss bl spruce, lab tea, moss, horsetail
510	WKH67	N	N	480938	6209526	KNSpt	TILL		Of	30-0	Ae	0-12	CL	Bt	12-50	С	Bg BC	50-120	C					"	E	2			VP	S0	В	bl spruce, lab tea, moss
511	WKH68	N	N	480875	6209460	KNSpt	TILL		Of	30-0	Ae	0-12	CL	Bt	10-56	SiCL	BC	56-120	CL						E	2			VP	S0	В	bl spruce, lab tea, moss
511	WKH69	N N	N	480802	6209465	KNSpt	TILL		Of	30-0	Ae	0-10	SiL	Вt	9-53	C	BC	53-120	C					L	E	2			VP	S0	В	bl spruce, lab tea, moss
512	vv K.H69	IN	IN	400002	u∠U9465	иморт	IILL		Oi	30-0	Ae	0-8	SIL	DI	y-53	C	BC	J3-12U	· ·										VP	50	D	ы эргисе, гао tea, moss

North American Kai Kos Dehseh SAGD Project
Volume 4, Appendix 9B

Site # LMB	Site Name	Analyzed	SAMPLED	Easting	Northing	Series with Modifier	Parent Material	LFH Depth (cm)	Organic Horizon	Organic Depth (cm)	A-Horizon	A-Depth (cm)	A-Texture	B- Horizon	B-Depth (cm)	B-Texture	BC/C- Horizon	BC/C- Depth (cm)	BC/C- Texture	C-Horizon	C-Depth (cm)	C-Texture	% Slope	Surface Expression	Slope Position		Slope Length	Aspect	Drainage	Surface Stoniness	Land Use	Comments
513	WKH70	N	N	480729	6209478	LVKpt	GLFL/TILL		Of	25-0	Ae	0-10	SL	Bt	10-55	SiCL	ВС	55-120	SCL					L	E	2			VP	S0	В	bl spruce, lab tea, moss
514	WKH71	N	N	480610	6209520	HLY	O/GLLC		Of	0-65				Bg	65-120	С								h	Е	2			VP	S0	F	tamarack, sedge, bog birch
515	WKH72	N	N	480625	6209629	HLY	O/GLLC		Of	0-100				Bg	100-120	CL								h	Е	2			VP	S0	F	tamarack, sedge, bog birch
516	WKH73	N	N	480730	6209601	KNSpt			Of	20-0	Ae	0-5	SL	Bt	5-58	CL	ВС	58-120	SCL					L	Е	2			VP	S0	В	bl spruce, pine, lab tea, moss
517	WKH74	N	N	480819	6209586	HLY	O/GLLC		Of	0-100				Bg	100-120	CL								h	Е	2			VP	S0	F	bl spruce, tamarack, lab tea, moss
518	WKH75	N	N	480903	6209564	ALGpt	GLLC		Of	50-0				Bg	0-120	CL								h	E	2			VP	S0	F	bl spruce, willow, tamarack, sedge
	•			•		•		•	•				•			•		•		•	•				•	•					•	

Nexen

ļ					_												_	-						•		
128 KH12	Y	502721 623798	DOV	GLLC	10-0	 	Ahe Ae	0-4 4-28	SiL SiCL	Bt	28-53	CL	ВС	53-120	SiC	 		 М	E	3	4-5	E	MW	SO	w	POPLAR, ASPEN, SIDE HILL, DYING OUT BIRCH, BEARBERRY

SITE INSPECTION LIST LEGEND

Soil Subg E.EB ME.OC TME.OC ME.F TY.F T.F HU.LG O.HG O.G	group Eluviated Eutric Brunisol Mesic Organic Cryosol Terric Mesic Organic Cryosol Mesic Fibrisol Typic Fibrosol Terric Fibrisol Humic Luvic Gleysol Orthic Humic Gleysol	T.H BR.GL GL.GL D.GL O.GL GLD.GL T.M TY.M	Terric Humisol Brunisolic Gray Luvisol Gleyed Gray Luvisol Orthic Gray Luvisol Gleyed Dark Gray L Terric Mesisol Typic Mesisol	l	Soil Seri ALG DOV FIR HRR KNS LVK MER MIL MKW MLD MRN MUS STP WNF	Algar Dover Firebag Horse Rive Kinosis Livock Meander Mildred Mikwaa McLelland Mariana Muskeg Steepbank Winefred
Modifier sh pt st gl zm gr xt yt	Shallow Peaty Stoney Gleyed Mesic Gravelly Till at 30-99cm Till at 100-200cm	Surface H I L R U M S	Expression Hummocky Inclined Level Ridged Undulating Rolling Steep Terraced		Slope Po C U M L T D	osition Crest Upper Mid Lower Toe Depressior Level
Drainage VP P I MW W R	Very Poor Poor Imperfect Moderately Well Well Rapid	Parent I GLFL TILL O GLLC GLTL EOLI	Material Glaciofluvial Till (morainal) Organic Glaciolacustrine Glaciolacustrine (till	-like)	Slope Lo 1 2 3 4 5 6	ength (m) 0-25 25-50 50-100 100-500 500-1000 >1000
Land Use W M	Woodland Bog, Fen, Marsh	Slope C 1 2 3 4 5	Class 0-0.05% 0.05-2.0% 2-5% 5-9% 9-15%	Surface S (% of grow S0 S1 S2	u nd surfa non-ston slightly s	nce covered) by (<0.01) tony (0.01-0.1) ely stony (0.1-
Coarse Te S LS	extures Media Sand SL Loamy Sand fSL L SiL SCL CL SiCL	loam Silt Loar	ndy Loam SiC SC m Clay Loam am	ctures Clay Silty Clay Sandy Cla	y	

E.EB MIL 0% Stones AGRASID Data

FIR Stones in profile

O.GL Dover GLLC

Horse River Till Calc

Kinosis Till Coarse Frags Livock GLFL/Till Non Calc

Meander Till

O McLelland Fen

O Muskeg Bog



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Organic Matter

Carbon

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received:

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 1 of 33

NWL Number Sample Date

421431-1 Oct 18, 2005

/ 13-0 / cm / Of

421431-2

1.6

0.79

Oct 18, 2005

Oct 19, 2005 JB18/

88.4

44.2

.15

0.05

421431-12

Sample Description JB8 / 4455051018001 JB8 / 4455051018002 / 0-14 / cm / Ae

4455051019012/

0-20 / cm / Of Matrix Soil Soil Soil Analyte Units Results Results Results **Detection Limit** Classification Total Nitrogen TKN % 1.26 0.05 0.55 0.01 Calcium Cations 14100 4 mg/kg 565 800 Magnesium Cations 880 280 2 mg/kg 64 Potassium Cations mg/kg 1400 70 1500 20

Sodium Cations mg/kg < 60 < 10 70 12 Base saturation % 73 41 8 1 meq/100g 0.0003 Calcium 70.2 2.82 4.0 Magnesium meq/100g 0.0008 7.2 0.52 2.3 Sodium meg/100g < 0.3 < 0.05 0.3 0.003

Potassium meq/100g 3.5 0.2 3.8 0.003 **ESP** % < 0.2 < 0.6 0.2 0.2 TEC meq/100g 81 4 10 2 Cation Exchange Capacity meq/100g 140 111 8.61

52.0

26.0

%

% dry weight

Total Organic



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received:

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 2 of 33

NWL Number Sample Date 421431-1

421431-2 Oct 18, 2005 421431-3

421431-4

Oct 18, 2005

Oct 18, 2005 Oct 18, 2005

/ 13-0 / cm / Of / 0-14 / cm / Ae / 14-50 / cm / Bt

Matrix Soil Soil Soil Analyte Units Results Results Results **Detection Limit** Salinity рΗ Saturated Paste рΗ 5.4 5.1 5.4 **Electrical Conductivity** Saturated Paste dS/m at 25 C 1.05 0.20 0.16 0.01 SAR Saturated Paste 0.2 <0.1 0.2 % Saturation % 385 45 46 Calcium Saturated Paste meq/L 10.5 1.46 1.21 0.01 Calcium Saturated Paste mg/kg 13.2 11.2 810 Magnesium Saturated Paste meq/L 0.54 0.44 0.02 2.65 Magnesium Saturated Paste mg/kg 123 2.9 2.4 Sodium Saturated Paste meq/L 0.16 0.17 0.04 0.12 Sodium Saturated Paste mg/kg 2 11 2 Potassium Saturated Paste meq/L 3.77 0.16 0.13 0.03 Potassium Saturated Paste mg/kg 566 3 2 **TGR** Saturated Paste T/ac <0.1 <0.1 <0.1

> **NWL Number** 421431-2 421431-3 Sample Date Oct 18, 2005 Oct 18, 2005

/ 0-14 / cm / Ae / 14-50 / cm / Bt /50-80 / cm / BC

> Matrix Soil Soil Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Ago	regate Properties					
Texture			Sandy Loam	Sandy Clay	Sandy Clay	
				Loam	Loam	
Sand	Soil Texture	% by weight	57.6	50.0	51.6	
Silt	Soil Texture	% by weight	32.8	20.4	22.8	
Clay	Soil Texture	% by weight	9.6	29.6	25.6	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received: Nov 04, 2005

Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 3 of 33

NWL Number Sample Date 421431-4

421431-5

Oct 18, 2005

421431-12 Oct 19, 2005 JB18/

Oct 18, 2005

/50-80/cm/BC /80-120 / cm / Ck 4455051019012/ 0-20 / cm / Of

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
рН	Saturated Paste	рН	6.9	7.6	3.6	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.38	0.42	0.29	0.01
SAR	Saturated Paste		0.2	0.2	0.3	
% Saturation		%	43	46	1630	
Calcium	Saturated Paste	meq/L	3.20	3.47	0.15	0.01
Calcium	Saturated Paste	mg/kg	27.8	32.2	49.0	
Magnesium	Saturated Paste	meq/L	1.37	1.34	0.12	0.02
Magnesium	Saturated Paste	mg/kg	7.2	7.5	22.8	
Sodium	Saturated Paste	meq/L	0.26	0.31	0.10	0.04
Sodium	Saturated Paste	mg/kg	2	3	39	
Potassium	Saturated Paste	meq/L	0.07	0.06	1.32	0.03
Potassium	Saturated Paste	mg/kg	1	1	842	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
		NWL Number	421431-5	421431-31	421431	-32
		Sample Date	Oct 18, 2005	Oct 19, 2005	Oct 19, 2	005
		Sample Description J	B8 / 4455051018005	LP12 /	LP12	
		,	/ 80-120 / cm / Ck	4455051019207 /	445505101	
				0-22 / cm / Ae	22-42 / cm	
		Matrix	Soil	Soil	Soil	

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Ag	gregate Properties					
Texture			Sandy Clay	Sand	Sand	
			Loam			
Sand	Soil Texture	% by weight	49.6	93.6	91.6	
Silt	Soil Texture	% by weight	23.8	3.8	2.8	
Clav	Soil Texture	% by weight	26 6	2 6	5 6	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

Saturated Paste

Saturated Paste

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Potassium

TGR

Project

ID:

4455-514

Name: **NAOS**

Christina Lake

LSD: P.O.:

Acct. Code:

Location:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received:

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 4 of 33

NWL Number Sample Date

mg/kg

T/ac

Sample Description

421431-13 Oct 19, 2005

20-50 / cm / Of

Oct 19, 2005 JB18/ 4455051019013/

JB18 / 455051019014 /50-130 / cm / Of

56

<0.1

421431-14

Oct 19, 2005 JB18/ 4455051019015 /

421431-15

130-220 / cm / Om

< 5

<0.1

Matrix Soil Soil Soil Analyte Units Results Results Results **Detection Limit** Salinity рΗ Saturated Paste рΗ 4.7 5.1 5.6 **Electrical Conductivity** Saturated Paste dS/m at 25 C 0.17 0.22 0.19 0.01 SAR Saturated Paste 0.1 0.1 <0.1 % Saturation % 815 806 499 Calcium Saturated Paste meq/L 1.35 1.81 2.07 0.01 Saturated Paste Calcium mg/kg 220 292 206 Saturated Paste Magnesium meq/L 0.56 0.71 0.94 0.02 Magnesium Saturated Paste mg/kg 55.5 69.0 56.5 Sodium Saturated Paste meq/L 0.14 0.15 0.11 0.04 Saturated Paste Sodium mg/kg 25 27 13 Potassium Saturated Paste 0.18 meq/L 0.12 < 0.03 0.03

38

<0.1



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD:

P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received: Nov 04, 2005 Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 5 of 33

NWL Number Sample Date

. . . .

Sample Description

421431-22 Oct 21, 2005 JB45/

421431-23 Oct 21, 2005 JB45/

421431-24 Oct 21, 2005 JB45/

4455051021025 / 0-20 / cm / Of

4455051021026 / 20-40 / cm / Of

4455051021027 / 40-220 / cm / Om

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
pH	Saturated Paste	pН	3.5	3.5	4.1	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.20	0.17	0.25	0.01
SAR	Saturated Paste		0.2	0.1	<0.1	
% Saturation		%	1680	980	574	
Calcium	Saturated Paste	meq/L	0.14	0.55	1.72	0.01
Calcium	Saturated Paste	mg/kg	45.8	107	198	
Magnesium	Saturated Paste	meq/L	0.08	0.18	0.64	0.02
Magnesium	Saturated Paste	mg/kg	16.8	22.0	44.8	
Sodium	Saturated Paste	meq/L	0.08	0.09	0.09	0.04
Sodium	Saturated Paste	mg/kg	29	20	12	
Potassium	Saturated Paste	meq/L	0.48	0.08	<0.03	0.03
Potassium	Saturated Paste	mg/kg	318	31	6	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: NAOS

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received: Nov 04, 2005

Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 6 of 33

NWL Number Sample Date

Sample Description

421431-22 Oct 21, 2005 JB45/

421431-30 Oct 19, 2005 LP12/

421431-31 Oct 19, 2005 LP12/

4455051021025 / 0-20 / cm / Of

4455051019206 / 8-0 / cm / Of

4455051019207 / 0-22 / cm / Ae

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.46	0.60	0.01	0.01
Calcium	Cations	mg/kg	700	1860	24	4
Magnesium	Cations	mg/kg	250	240	5	2
Potassium	Cations	mg/kg	900	700	<20	20
Sodium	Cations	mg/kg	60	<60	<10	12
Base saturation		%	5	21	5	1
Calcium		meq/100g	3.5	9.31	0.12	0.0003
Magnesium		meq/100g	2.0	2.0	0.04	0.0008
Sodium		meq/100g	0.3	<0.3	<0.05	0.003
Potassium		meq/100g	2	2	<0.05	0.003
ESP		%	0.2	<0.4	<2	0.2
TEC		meq/100g	8	10	<2	2
Cation Exchange Capacit	ty	meq/100g	154	61.2	2.87	
Organic Matter		%	88.4	70.4	<0.2	.15
Carbon	Total Organic	% dry weight	44.2	35.2	0.06	0.05



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514

Name: NAOS

Christina Lake

LSD: P.O.:

Acct. Code:

Location:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 7 of 33

NWL Number Sample Date 421431-30 Oct 19, 2005 421431-31 Oct 19, 2005 LP12 / 421431-32 Oct 19, 2005 LP12 /

Sample Description

LP12 / 4455051019206 / 8-0 / cm / Of

4455051019207 / 0-22 / cm / Ae 4455051019208 / 22-42 / cm / Bm

Matrix Soil Soil Soil

		iviatrix	Results	5011	5011	
Analyte		Units		Results	Results	Detection Limit
Salinity						
pH	Saturated Paste	рН	4.2	4.8	5.6	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.52	0.06	0.06	0.01
SAR	Saturated Paste		<0.1	0.2	0.2	
% Saturation		%	380	32	35	
Calcium	Saturated Paste	meq/L	2.22	0.21	0.32	0.01
Calcium	Saturated Paste	mg/kg	169	1.4	2.2	
Magnesium	Saturated Paste	meq/L	0.96	0.09	0.12	0.02
Magnesium	Saturated Paste	mg/kg	44.0	0.4	0.5	
Sodium	Saturated Paste	meq/L	0.09	0.09	0.10	0.04
Sodium	Saturated Paste	mg/kg	8	1	1	
Potassium	Saturated Paste	meq/L	1.82	0.07	0.07	0.03
Potassium	Saturated Paste	mg/kg	269	<1	<1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received:

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 8 of 33

NWL Number Sample Date Sample Description

421431-33 Oct 19, 2005

42-82 / cm / BC

LP12/ 4455051019209 /

Oct 19, 2005 LP12/ 4455051019210 /

421431-34

82-120 / cm / C

Oct 19, 2005 LP32 / 4455051019211 / 8-0 /

421431-35

cm / Of Soil

Matrix Soil Soil Analyte Units Results Results Results **Detection Limit** Salinity рΗ Saturated Paste рΗ 5.8 5.2 4.2 **Electrical Conductivity** Saturated Paste dS/m at 25 C 0.05 0.08 0.67 0.01 SAR Saturated Paste 0.3 0.5 0.1 % Saturation % 30 34 624 Calcium Saturated Paste meq/L 0.19 0.23 2.08 0.01 1.1 Calcium Saturated Paste mg/kg 1.6 260 Saturated Paste Magnesium meq/L 0.09 0.13 1.06 0.02 Magnesium Saturated Paste mg/kg 0.3 0.5 80.0 Sodium Saturated Paste meq/L 0.12 0.22 0.18 0.04 Saturated Paste Sodium mg/kg 1 2 26 Potassium Saturated Paste meq/L 0.08 0.10 3.63 0.03 Potassium Saturated Paste mg/kg <1 1 884 TGR Saturated Paste T/ac <0.1 <0.1 <0.1 **NWL Number** 421431-33 421431-34 421431-36 Sample Date Oct 19, 2005 Oct 19, 2005 Oct 19, 2005 Sample Description LP12/ LP12 / LP32 / 4455051019209 / 4455051019210 / 4455051019212 / 42-82 / cm / BC 82-120 / cm / C 0-12 / cm / Ae Matrix Soil Soil Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Ago	regate Properties					
Texture		Sa	and	Sandy Loam	Sandy Loam	
Sand	Soil Texture	% by weight	89.6	80.6	53.6	
Silt	Soil Texture	% by weight	3.8	7.8	40.8	
Clay	Soil Texture	% by weight	6.6	11.6	5.6	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514

Name: NAOS

Location: Christina Lake

LSD: P.O.:

Acct. Code:

Matrix

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005

Date Reported: Feb 15, 2007 Report Number: 966613

Page: 9 of 33

NWL Number Sample Date 421431-35 Oct 19, 2005

cm / Of

Soil

421431-36 Oct 19, 2005 LP32 / 421431-37 Oct 19, 2005 LP32 /

Sample Description

LP32 / 4455051019211 / 8-0 /

4455051019212 / 0-12 / cm / Ae

4455051019213 / 12-28 / cm / Bt

Soil

		Matrix	Soli	5011	5011	
Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.71	0.05	0.02	0.01
Calcium	Cations	mg/kg	2740	190	1200	4
Magnesium	Cations	mg/kg	380	31	337	2
Potassium	Cations	mg/kg	1700	50	90	20
Sodium	Cations	mg/kg	<60	<10	20	12
Base saturation		%	39	18	66	1
Calcium		meq/100g	13.7	0.95	5.99	0.0003
Magnesium		meq/100g	3.2	0.26	2.77	0.0008
Sodium		meq/100g	<0.3	<0.05	0.07	0.003
Potassium		meq/100g	4.3	0.1	0.2	0.003
ESP		%	<0.5	<0.7	0.5	0.2
TEC		meq/100g	21	<2	9	2
Cation Exchange Capacity		meq/100g	54.2	7.30	13.7	
Organic Matter		%	66.1	1.5	0.48	.15
Carbon	Total Organic	% dry weight	33.0	0.76	0.24	0.05



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: NAOS

Location: Christina Lake

LSD:

P.O.:

Acct. Code:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 10 of 33

NWL Number Sample Date Sample Description 421431-36 Oct 19, 2005 LP32 /

4455051019212/

0-12 / cm / Ae

Oct 19, 2005 LP32 / 445505101921

421431-37

LP32 / 4455051019213 / 12-28 / cm / Bt 421431-38 Oct 19, 2005 LP32 /

4455051019214 / 28-96 / cm / BC

		Matrix	Soil	Soil	Soi	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
рН	Saturated Paste	рН	4.0	4.7	5.3	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.19	0.08	0.10	0.01
SAR	Saturated Paste		0.2	0.4	0.4	
% Saturation		%	42	44	39	
Calcium	Saturated Paste	meq/L	1.02	0.37	0.46	0.01
Calcium	Saturated Paste	mg/kg	8.6	3.3	3.6	
Magnesium	Saturated Paste	meq/L	0.49	0.19	0.26	0.02
Magnesium	Saturated Paste	mg/kg	2.5	1.0	1.2	
Sodium	Saturated Paste	meq/L	0.16	0.21	0.24	0.04
Sodium	Saturated Paste	mg/kg	2	2	2	
Potassium	Saturated Paste	meq/L	0.22	0.06	0.05	0.03
Potassium	Saturated Paste	mg/kg	4	1	<1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
		NWL Number	421431-37	421431-38	421431	-39
		Sample Date	Oct 19, 2005	Oct 19, 2005	Oct 19, 2	2005
		Sample Description	LP32 /	LP32 /	LP32	
			4455051019213 /	4455051019214 /	44550510	
			12-28 / cm / Bt	28-96 / cm / BC	96-120 / c	m / Ck
		Matrix	Soil	Soil	Soi	
Analyte		Units	Results	Results	Results	Detection Limit

Allalyte		Offics	Results	Results	Results	Detection Limit
Physical and Ago	gregate Properties					
Texture		S	andy Clay	Sandy Clay	Sandy Clay	
		L	oam	Loam	Loam	
Sand	Soil Texture	% by weight	52.6	55.6	53.6	
Silt	Soil Texture	% by weight	21.4	20.4	23.8	
Clay	Soil Texture	% by weight	26.0	24.0	22.6	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received:

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 11 of 33

NWL Number Sample Date

421431-39 Oct 19, 2005

421431-40 Oct 20, 2005

LP38 /

421431-41 Oct 20, 2005

Sample Description

LP32/ 4455051019215 /

4455051020216 / 5-0 / 4455051020217 / 0-5 / cm / LFH

LP38 /

96-120 / cm / Ck Soil

Soil

cm / Ae Soil

Matrix Analyte Units Results Results Results **Detection Limit** Salinity рΗ Saturated Paste рΗ 7.3 6.0 7.2 **Electrical Conductivity** Saturated Paste dS/m at 25 C 0.44 1.75 0.35 0.01 SAR Saturated Paste 0.2 0.1 <0.1 % Saturation % 356 40 39 Calcium Saturated Paste meq/L 3.08 9.87 2.78 0.01 Saturated Paste Calcium mg/kg 24.6 702 21.8 Saturated Paste Magnesium meq/L 1.42 6.29 1.78 0.02 Magnesium Saturated Paste 6.9 mg/kg 270 8.5 Sodium Saturated Paste meq/L 0.30 0.12 0.20 0.04 Saturated Paste Sodium mg/kg 3 10 2 Potassium Saturated Paste meq/L 0.04 8.99 0.05 0.03 Potassium Saturated Paste mg/kg <1 1250 <1 TGR Saturated Paste T/ac <0.1 <0.1 <0.1



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Christina Lake

LSD:

P.O.:

Location:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number: Date Received:

Feb 15, 2007 Date Reported:

Nov 04, 2005

966613 Report Number:

Page: 12 of 33

NWL Number Sample Date

421431-40 Oct 20, 2005

421431-41 Oct 20, 2005

421431-42 Oct 20, 2005

Sample Description

LP38/

LP38 / 4455051020216 / 5-0 / 4455051020217 / 0-5 /

LP38/ 4455051020218 /

5-55 / cm / Bt

cm / LFH cm / Ae Matrix Soil Soil Soil

		iviatrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.93	0.05	0.03	0.01
Calcium	Cations	mg/kg	9350	1330	1790	4
Magnesium	Cations	mg/kg	1460	312	632	2
Potassium	Cations	mg/kg	2000	60	100	20
Sodium	Cations	mg/kg	<60	24	20	12
Base saturation		%	78	88	68	1
Calcium		meq/100g	46.6	6.63	8.92	0.0003
Magnesium		meq/100g	12.0	2.57	5.19	0.0008
Sodium		meq/100g	<0.3	0.11	0.089	0.003
Potassium		meq/100g	5.2	0.1	0.4	0.003
ESP		%	<0.3	0.99	0.42	0.2
TEC		meq/100g	64	9	14	2
Cation Exchange Capacity		meq/100g	82.0	10.7	21.3	
Organic Matter		%	48.1	1.0	0.72	.15
Carbon	Total Organic	% dry weight	24.0	0.52	0.36	0.05
		NWL Number	421431-41	421431-42	421431-	·43

Sample Date Sample Description

Matrix

Oct 20, 2005 LP38/

Soil

Oct 20, 2005 LP38 /

Oct 20, 2005 LP38 /

4455051020217 / 0-5 / cm / Ae

4455051020218 / 5-55 / cm / Bt Soil

4455051020219 / 55-73 / cm / BCg Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Ago	gregate Properties					
Texture		Si	lt Loam	Clay Loam	Loam	
Sand	Soil Texture	% by weight	21.6	25.2	35.6	
Silt	Soil Texture	% by weight	62.8	44.8	42.8	
Clay	Soil Texture	% by weight	15.6	30.0	21.6	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received: Date Reported: Feb 15, 2007

Report Number: 966613

Page: 13 of 33

NWL Number Sample Date Sample Description

421431-42 Oct 20, 2005 LP38/

4455051020218 /

5-55 / cm / Bt

Oct 20, 2005 LP38/ 4455051020219 / 55-73 / cm / BCg

Soil

421431-43

Oct 20, 2005 LP38/ 4455051020220 / 73-110 / cm / Ckg

Soil

421431-44

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
рН	Saturated Paste	рН	5.4	7.2	7.6	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.19	0.37	0.32	0.01
SAR	Saturated Paste		0.3	0.2	0.2	
% Saturation		%	42	47	42	
Calcium	Saturated Paste	meq/L	1.08	2.81	2.39	0.01
Calcium	Saturated Paste	mg/kg	9.2	26.7	20.1	
Magnesium	Saturated Paste	meq/L	0.80	1.50	1.16	0.02
Magnesium	Saturated Paste	mg/kg	4.1	8.6	5.9	
Sodium	Saturated Paste	meq/L	0.29	0.34	0.28	0.04
Sodium	Saturated Paste	mg/kg	3	4	3	
Potassium	Saturated Paste	meq/L	0.09	0.05	0.07	0.03
Potassium	Saturated Paste	mg/kg	2	<1	1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
		NWL Number	421431-44	421431-61	421431	-62
		Sample Date	Oct 20, 2005	Oct 24, 2005	Oct 24, 2	005
		Sample Description	LP38 /	LP93 /	LP93	
		, , , , , ,	4455051020220 /	4455051024237 / 0-6 /	445505102	
			73-110 / cm / Ckg	cm / Ae	6-33 / cm	/ Bm

Analyte Units Results Results Results **Detection Limit Physical and Aggregate Properties** Texture Sandy Loam Sandy Loam Loam Sand Soil Texture % by weight 62.0 56.6 35.6 Silt Soil Texture % by weight 48.4 32.8 25.8 Clay Soil Texture % by weight 16.0 5.2 17.6

Soil

Matrix



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514 Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received: Nov 04, 2005

Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 14 of 33

NWL Number Sample Date Sample Description

421431-45 Oct 23, 2005 LP68/

4455051023221 / 0-20 / cm / Of

Oct 23, 2005 LP68/ 4455051023222 / 20-220 / cm / Of

421431-46

Oct 24, 2005 LP93/ 4455051024236 / 12-0 / cm / Of

421431-60

		Matrix	Soil Results	Soil Results	Soil	
Analyte		Units			Results	Detection Limit
Salinity						
pH	Saturated Paste	рН	4.0	4.5	4.6	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.32	0.29	0.85	0.01
SAR	Saturated Paste		0.1	0.2	<0.1	
% Saturation		%	1280	413	486	
Calcium	Saturated Paste	meq/L	0.70	1.83	4.90	0.01
Calcium	Saturated Paste	mg/kg	178	151	476	
Magnesium	Saturated Paste	meq/L	0.59	0.96	1.80	0.02
Magnesium	Saturated Paste	mg/kg	91.8	47.7	106	
Sodium	Saturated Paste	meq/L	0.11	0.19	0.14	0.04
Sodium	Saturated Paste	mg/kg	32	18	15	
Potassium	Saturated Paste	meq/L	1.44	0.32	4.09	0.03
Potassium	Saturated Paste	mg/kg	717	52	774	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received: Nov 04, 2005

Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 15 of 33

NWL Number Sample Date

Sample Description

421431-45 Oct 23, 2005 LP68/

421431-60 Oct 24, 2005 LP93/

421431-61 Oct 24, 2005 LP93/

4455051023221 / 0-20 / cm / Of

4455051024236 / 12-0 / cm / Of

4455051024237 / 0-6 / cm / Ae

. . . .

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.80	1.16	0.04	0.01
Calcium	Cations	mg/kg	2920	5470	56	4
Magnesium	Cations	mg/kg	890	530	20	2
Potassium	Cations	mg/kg	1300	1600	80	20
Sodium	Cations	mg/kg	60	130	<10	12
Base saturation		%	33	46	9	1
Calcium		meq/100g	14.6	27.3	0.28	0.0003
Magnesium		meq/100g	7.3	4.4	0.1	0.0008
Sodium		meq/100g	0.3	0.57	<0.05	0.003
Potassium		meq/100g	3.4	4.2	0.2	0.003
ESP		%	0.4	0.72	<0.7	0.2
TEC		meq/100g	26	36	<2	2
Cation Exchange Capacity		meq/100g	76.4	78.8	6.99	
Organic Matter		%	87.2	73.6	1.2	.15
Carbon	Total Organic	% dry weight	43.6	36.8	0.58	0.05



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received: Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 16 of 33

NWL Number Sample Date

Sample Description

421431-61 Oct 24, 2005

LP93/

421431-62 Oct 24, 2005 LP93/

421431-63 Oct 24, 2005 LP93/

4455051024237 / 0-6 / cm / Ae

4455051024238 / 6-33 / cm / Bm

4455051024239 / 33-52 / cm / Bt

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
pH	Saturated Paste	pН	3.7	4.9	4.6	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.17	0.10	0.07	0.01
SAR	Saturated Paste		0.2	0.2	0.5	
% Saturation		%	40	39	43	
Calcium	Saturated Paste	meq/L	0.32	0.36	0.18	0.01
Calcium	Saturated Paste	mg/kg	2.6	2.8	1.6	
Magnesium	Saturated Paste	meq/L	0.23	0.20	0.09	0.02
Magnesium	Saturated Paste	mg/kg	1.1	1.0	0.4	
Sodium	Saturated Paste	meq/L	0.13	0.12	0.18	0.04
Sodium	Saturated Paste	mg/kg	1	1	2	
Potassium	Saturated Paste	meq/L	0.18	0.20	0.12	0.03
Potassium	Saturated Paste	mg/kg	3	3	2	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4 Phone: (780) 438-5522

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: NAOS

Location: Christina Lake

LSD:

P.O.:

Acct. Code:

Matrix

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 17 of 33

NWL Number Sample Date Sample Description

421431-62 Oct 24, 2005 LP93 / 421431-64 Oct 22, 2005 SA75 / 4455051022450 /

Oct 22, 2005 SA75 / 4455051022451 / 0-3 /

421431-65

4455051024238 / 445 6-33 / cm / Bm 10 Soil

10-0 / cm / LFH Soil cm / Ahe Soil

Analyte Units Results Results Results **Detection Limit** Classification Total Nitrogen TKN % 0.05 0.96 0.09 0.01 Calcium Cations mg/kg 211 2040 64 4 Cations Magnesium 50 28 2 mg/kg 310 Potassium Cations mg/kg 100 1400 70 20 Sodium Cations mg/kg < 10 70 <10 12 Base saturation % 11 14 5 1 Calcium meq/100g 1.05 10.2 0.32 0.0003 Magnesium meq/100g 0.0008 0.41 2.5 0.23 Sodium meg/100g <0.05 0.3 < 0.05 0.003 Potassium meq/100g 0.2 3.6 0.2 0.003 **ESP** % < 0.3 0.3 < 0.4 0.2 meq/100g TEC <2 17 <2 2 Cation Exchange Capacity meq/100g 15.0 114 13.8 Organic Matter % 1.2 71.8 3.94 .15 Carbon **Total Organic** % dry weight 1.97 0.58 35.9 0.05 **NWL Number** 421431-63 421431-65 421431-66 Sample Date Oct 24, 2005 Oct 22, 2005 Oct 22, 2005 Sample Description LP93/ SA75 / SA75 / 4455051024239 / 4455051022452/ 4455051022451 / 0-3 / 33-52 / cm / Bt 3-40 / cm / Ae cm / Ahe Matrix Soil Soil Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Ag	gregate Properties					
Texture		S	Sandy Clay	Silt Loam	Silt Loam	
		I	Loam			
Sand	Soil Texture	% by weight	53.2	22.6	22.6	
Silt	Soil Texture	% by weight	24.8	61.8	63.8	
Clay	Soil Texture	% by weight	22.0	15.6	13.6	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514 Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received:

Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 18 of 33

NWL Number Sample Date

Sample Description

421431-64 Oct 22, 2005 SA75/

421431-65 Oct 22, 2005 SA75 /

421431-66 Oct 22, 2005 SA75/

4455051022450 / 10-0 / cm / LFH

4455051022451 / 0-3 / cm / Ahe

4455051022452 / 3-40 / cm / Ae

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
pH	Saturated Paste	рН	3.6	4.0	5.0	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.75	0.22	0.08	0.01
SAR	Saturated Paste		0.2	0.4	0.4	
% Saturation		%	471	52	32	
Calcium	Saturated Paste	meq/L	2.43	0.44	0.27	0.01
Calcium	Saturated Paste	mg/kg	229	4.6	1.7	
Magnesium	Saturated Paste	meq/L	1.25	0.46	0.18	0.02
Magnesium	Saturated Paste	mg/kg	71.2	2.9	0.7	
Sodium	Saturated Paste	meq/L	0.25	0.29	0.21	0.04
Sodium	Saturated Paste	mg/kg	27	4	2	
Potassium	Saturated Paste	meq/L	3.42	0.22	0.10	0.03
Potassium	Saturated Paste	mg/kg	629	4	1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received: Date Reported: Feb 15, 2007

Report Number: 966613

Page: 19 of 33

NWL Number Sample Date

Sample Description

421431-66 Oct 22, 2005

SA75 /

421431-69 421431-70 Oct 18, 2005 Oct 18, 2005 SA5 / 4455051018400 SA5 / 4455051018401

4455051022452/ / 0-10 / cm / Oh 3-40 / cm / Ae

Soil Soil

/10-40/cm/Bg

Matrix Soil Analyte Units Results Results Results **Detection Limit** Classification Total Nitrogen TKN % 0.05 1.00 0.05 0.01 Calcium Cations 20400 1840 4 mg/kg 180 Magnesium Cations 2 49 2340 mg/kg 360 Potassium Cations mg/kg 50 100 100 20 Sodium Cations mg/kg < 10 < 60 31 12 Base saturation % 360 82 92 1 meq/100g 0.0003 Calcium 0.88 102 9.20 2.96 Magnesium meq/100g 0.0008 0.40 19.2 Sodium meg/100g <0.05 < 0.3 0.14 0.003 Potassium meq/100g 0.1 0.3 0.2 0.003 **ESP** <0.2 % <10 0.99 0.2 TEC meq/100g <2 122 12 2 Cation Exchange Capacity meq/100g 149 13.7 0.38 Organic Matter % 0.42 30.8 1.2 .15 Carbon **Total Organic** % dry weight 0.21 15.4 0.63 0.05



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

Matrix

NWL Lot ID: 421431

M 009708 Control Number:

Date Received: Nov 04, 2005

Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 20 of 33

NWL Number Sample Date

Sample Description

421431-67 Oct 22, 2005

40-80 / cm / Bt1

Soil

Oct 22, 2005 SA75/ SA75/ 4455051022453 /

4455051022454 /

SA5 / 4455051018400 / 0-10 / cm / Oh

421431-69

Oct 18, 2005

80-110 / cm / IIBt2 Soil

421431-68

Soil

		Matrix	Oon	Ooli	0011	
Analyte		Units	Results	Results	Results	Detection Limit
Physical and Aggrega	te Properties					
Texture		S	andy Loam	Sandy Clay	Sandy Loam	
				Loam		
Sand	Soil Texture	% by weight	56.6	51.6	59.2	
Silt	Soil Texture	% by weight	24.8	22.8	36.8	
Clay	Soil Texture	% by weight	18.6	25.6	4.0	
Salinity						
pH	Saturated Paste	рН	4.8	5.1	6.2	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.07	0.08	0.29	0.01
SAR	Saturated Paste		0.6	0.7	0.1	
% Saturation		%	31	42	269	
Calcium	Saturated Paste	meq/L	0.18	0.28	2.50	0.01
Calcium	Saturated Paste	mg/kg	1.1	2.4	135	
Magnesium	Saturated Paste	meq/L	0.11	0.11	1.33	0.02
Magnesium	Saturated Paste	mg/kg	0.4	0.6	43.3	
Sodium	Saturated Paste	meq/L	0.24	0.31	0.16	0.04
Sodium	Saturated Paste	mg/kg	2	3	10	
Potassium	Saturated Paste	meq/L	0.09	0.07	0.12	0.03
Potassium	Saturated Paste	mg/kg	1	1	13	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received: Nov 04, 2005

Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 21 of 33

NWL Number Sample Date 421431-70

421431-71 Oct 18, 2005

421431-74 Oct 19, 2005

Oct 18, 2005 Sample Description SA5 / 4455051018401 SA5 / 4455051018402 /10-40/cm/Bg

/40-110+/cm/BCg

SA26 / 4455051019409 /

0-20 / cm / Of

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
pH	Saturated Paste	рН	6.6	6.6	3.5	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.20	0.20	0.19	0.01
SAR	Saturated Paste		0.2	0.3	0.2	
% Saturation		%	40	40	1440	
Calcium	Saturated Paste	meq/L	1.51	1.06	0.15	0.01
Calcium	Saturated Paste	mg/kg	12.2	8.6	43.1	
Magnesium	Saturated Paste	meq/L	0.78	0.64	0.10	0.02
Magnesium	Saturated Paste	mg/kg	3.8	3.1	17.2	
Sodium	Saturated Paste	meq/L	0.20	0.32	0.08	0.04
Sodium	Saturated Paste	mg/kg	2	3	25	
Potassium	Saturated Paste	meq/L	0.12	0.16	0.31	0.03
Potassium	Saturated Paste	mg/kg	2	2	175	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
		NWL Number	421431-70	421431-71	421431-7	76
		Sample Date	Oct 18, 2005	Oct 18, 2005	Oct 19, 20	05
		Sample Description S	A5 / 4455051018401			

Sample Description SA5 / 4455051018401 SA5 / 4455051018402 /10-40/cm/Bg /40-110+/cm/BCg

4455051019411/ 200-220 / cm / IIBg

Matrix Soil Soil Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Aggre	gate Properties					
Texture		Sa	andy Loam	Clay Loam	Loam	
Sand	Soil Texture	% by weight	59.6	43.6	29.6	
Silt	Soil Texture	% by weight	22.4	23.8	47.4	
Clay	Soil Texture	% by weight	18.0	32.6	23.0	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Cation Exchange Capacity

Total Organic

Organic Matter

Carbon

Project

ID:

4455-514

Name: NAOS

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 22 of 33

NWL Number Sample Date

meq/100g

%

% dry weight

Sample Description

421431-74 Oct 19, 2005 SA26 /

Oct 19, 2005 SA28 / 4455051019412 / 5-0 /

443

38.4

19.2

421431-77

421431-78 Oct 19, 2005 SA28 / 4455051019413 /

0-18 / cm / Ae

16.9

0.63

0.32

.15

0.05

4455051019409 / 4455051019412 / 5-0 / 0-20 / cm / Of cm / LFH

Matrix Soil Soil Soil Analyte Units Results Results Results **Detection Limit** Classification Total Nitrogen TKN % 0.48 0.60 0.02 0.01 Calcium Cations 4 mg/kg 870 1830 45 Magnesium Cations mg/kg 260 320 8 2 Potassium Cations 20 mg/kg 500 500 20 Sodium Cations mg/kg 70 60 < 10 12 Base saturation % 2 3 2 1 Calcium meq/100g 0.0003 4.3 9.14 0.23 Magnesium meq/100g 0.0008 2.2 2.6 0.06 Sodium meg/100g 0.3 0.3 <0.05 0.003 Potassium meq/100g 1 1 0.07 0.003 **ESP** % 0.08 0.06 < 0.3 0.2 TEC meq/100g 8 10 <2 2

377

86.9

43.4



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514 Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received:

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 23 of 33

NWL Number Sample Date

Sample Description

421431-75 Oct 19, 2005

Oct 19, 2005 SA26/ SA26/ 4455051019410/ 4455051019411/

Oct 19, 2005 SA28 / 4455051019412 / 5-0 /

421431-77

20-200 / cm / Of 200-220 / cm / IIBg cm / LFH Soil Soil Soil

421431-76

Matrix Analyte Units Results Results Results **Detection Limit** Salinity рΗ Saturated Paste рΗ 3.5 4.2 3.9 **Electrical Conductivity** Saturated Paste dS/m at 25 C 0.18 0.30 0.30 0.01 SAR Saturated Paste 0.3 0.2 0.1 % Saturation % 616 49 432 Calcium Saturated Paste meq/L 0.56 1.26 1.20 0.01 Saturated Paste Calcium mg/kg 68.6 12.4 103 Saturated Paste Magnesium meq/L 0.29 0.91 0.83 0.02 Magnesium Saturated Paste mg/kg 21.4 5.4 43.4 Sodium Saturated Paste meq/L 0.12 0.31 0.11 0.04 Saturated Paste Sodium mg/kg 17 3 11 Potassium Saturated Paste meq/L 0.11 0.29 0.80 0.03 Potassium Saturated Paste mg/kg 26 6 134 TGR <0.1 Saturated Paste T/ac <0.1 <0.1



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

Location:

ID:

4455-514

Name: **NAOS**

Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received: Nov 04, 2005

Feb 15, 2007 Date Reported:

966613 Report Number:

Page: 24 of 33

421431-80

Oct 19, 2005

NWL Number Sample Date Sample Description

421431-78 Oct 19, 2005

Oct 19, 2005 SA28 / SA28 / 4455051019414 / 4455051019413/ 0-18 / cm / Ae 18-50 / cm / Bm

SA28/ 4455051019415 / 50-90 / cm / Bt

421431-79

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Physical and Aggrega	te Properties					
Texture]	Loamy Sand	Loamy Sand	Sandy Clay	
					Loam	
Sand	Soil Texture	% by weight	84.6	81.6	59.6	
Silt	Soil Texture	% by weight	12.4	12.4	20.4	
Clay	Soil Texture	% by weight	3.0	6.0	20.0	
Salinity						
pH	Saturated Paste	рН	4.0	5.1	4.9	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.13	0.07	0.09	0.01
SAR	Saturated Paste		0.4	0.3	0.8	
% Saturation		%	27	26	32	
Calcium	Saturated Paste	meq/L	0.28	0.21	0.22	0.01
Calcium	Saturated Paste	mg/kg	1.5	1.1	1.5	
Magnesium	Saturated Paste	meq/L	0.22	0.10	0.14	0.02
Magnesium	Saturated Paste	mg/kg	0.7	0.3	0.5	
Sodium	Saturated Paste	meq/L	0.18	0.13	0.34	0.04
Sodium	Saturated Paste	mg/kg	1	1	2	
Potassium	Saturated Paste	meq/L	0.31	0.12	0.17	0.03
Potassium	Saturated Paste	mg/kg	3	1	2	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Christina Lake

LSD: P.O.:

Acct. Code:

Location:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received:

Feb 15, 2007 Date Reported:

Nov 04, 2005

966613 Report Number:

Page: 25 of 33

421431-83

NWL Number Sample Date Sample Description

421431-81 Oct 19, 2005 SA28/

4455051019416 / 90-140 / cm / BC

Oct 20, 2005 SA53/

421431-82

Oct 20, 2005 SA53/

4455051020430 / 8-0 / 4455051020431 / cm / LFH 0-20 / cm / Ae

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						_
рН	Saturated Paste	рН	5.0	4.1	4.9	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.16	0.87	0.08	0.01
SAR	Saturated Paste		0.8	0.2	0.4	
% Saturation		%	41	609	38	
Calcium	Saturated Paste	meq/L	0.46	2.39	0.36	0.01
Calcium	Saturated Paste	mg/kg	3.8	291	2.8	
Magnesium	Saturated Paste	meq/L	0.27	1.38	0.19	0.02
Magnesium	Saturated Paste	mg/kg	1.4	102	0.9	
Sodium	Saturated Paste	meq/L	0.49	0.31	0.22	0.04
Sodium	Saturated Paste	mg/kg	5	44	2	
Potassium	Saturated Paste	meq/L	0.19	5.18	0.09	0.03
Potassium	Saturated Paste	mg/kg	3	1230	1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
		NWL Number	421431-81	421431-83	421431	-84
		Sample Date	Oct 19, 2005	Oct 20, 2005	Oct 20, 2	005
		Sample Description	SA28 /	SA53 /	SA53	
			4455051019416 /	4455051020431 /	445505102	
			90-140 / cm / BC	0-20 / cm / Ae	20-50 / cn	
		Matrix	Soil	Soil	Soil	
Analyto		Unite	Poculte	Poculte	Poculte	Detection Limit

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Ag	gregate Properties					
Texture		S	andy Loam	Silt Loam	Clay Loam	
Sand	Soil Texture	% by weight	57.6	32.6	31.6	
Silt	Soil Texture	% by weight	23.4	52.8	38.0	
Clay	Soil Texture	% by weight	19.0	14.6	30.4	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

M 009708 Control Number:

Nov 04, 2005 Date Received:

Date Reported: Feb 15, 2007

Report Number: 966613

> 26 of 33 Page:

NWL Number Sample Date

Sample Description

421431-82 Oct 20, 2005

SA53 /

4455051020430 / 8-0 /

421431-83 Oct 20, 2005

SA53 /

Oct 23, 2005 SN6 / 4455051023460 / 0-65 / cm / Oh

421431-92

4455051020431 / 0-20 / cm / Ae

cm / LFH

Soil

Matrix Soil Soil Analyte Units Results Results Results **Detection Limit** Classification Total Nitrogen TKN % 0.64 0.03 1.34 0.01 Calcium Cations 3410 4 mg/kg 170 6560 Magnesium Cations 2 600 mg/kg 41 490 Potassium Cations mg/kg 2300 60 <100 20 Sodium Cations mg/kg 90 < 10 < 60 12 Base saturation % 8 4 11 1 meq/100g 0.0003 Calcium 17.0 0.84 32.7 Magnesium meq/100g 4.9 0.0008 0.34 4.0 Sodium meg/100g 0.4 < 0.05 < 0.3 0.003 Potassium meq/100g 5.8 0.1 <0.2 0.003 **ESP** % 0.1 < 0.2 <0.08 0.2 TEC meq/100g 28 <2 37 2 Cation Exchange Capacity meq/100g 29.1 372 341 Organic Matter % 88.0 0.49 33.8 .15 Carbon **Total Organic** % dry weight 44.0 0.24 16.9 0.05



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: **NAOS**

Christina Lake

LSD:

P.O.:

Acct. Code:

Location:

NWL Lot ID: 421431

M 009708 Control Number:

Date Received:

Feb 15, 2007 Date Reported:

Nov 04, 2005

966613 Report Number:

Page: 27 of 33

NWL Number Sample Date Sample Description

421431-84 Oct 20, 2005 SA53/

Oct 20, 2005 SA53/ 4455051020432/ 4455051020433 / 20-50 / cm / Bt1

50-80 / cm / Bt2

421431-85

421431-86 Oct 20, 2005 SA53/

4455051020434 / 80-110+/cm/BC

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
pH	Saturated Paste	рН	4.7	4.9	5.0	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.08	0.07	0.09	0.01
SAR	Saturated Paste		0.5	0.7	0.6	
% Saturation		%	44	39	30	
Calcium	Saturated Paste	meq/L	0.20	0.16	0.25	0.01
Calcium	Saturated Paste	mg/kg	1.7	1.2	1.5	
Magnesium	Saturated Paste	meq/L	0.14	0.10	0.14	0.02
Magnesium	Saturated Paste	mg/kg	0.7	0.5	0.5	
Sodium	Saturated Paste	meq/L	0.19	0.25	0.29	0.04
Sodium	Saturated Paste	mg/kg	2	2	2	
Potassium	Saturated Paste	meq/L	0.07	0.05	0.07	0.03
Potassium	Saturated Paste	mg/kg	1	<1	<1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
		NWL Number	421431-85	421431-86	421431	-93
		Sample Date	Oct 20, 2005	Oct 20, 2005	Oct 23, 2	005
		Sample Description	SA53 / 4455051020433 / 50-80 / cm / Bt2	SA53 / 4455051020434 / 80-110+ / cm / BC	SN6 / 445505 / 65-95 / cm	1023461
		Matrix	Soil	Soil	Soil	

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Agg	regate Properties					
Texture		Lo	oam	Sandy Loam	Loam	
Sand	Soil Texture	% by weight	46.0	59.0	38.7	
Silt	Soil Texture	% by weight	32.6	24.2	41.3	
Clay	Soil Texture	% by weight	21.4	16.8	20.0	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W.

230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID:

4455-514

Name: NAOS

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005

Date Reported: Feb 15, 2007

Report Number: 966613

Page: 28 of 33

NWL Number

421431-92

421431-93

421431-94

Sample Date

Oct 23, 2005

Oct 23, 2005

Oct 23, 2005

Sample Description SN6 / 4455051023460 SN6 / 4455051023461 SN6 / 4455051023462

/ 0-65 / cm / Oh

/65-95 / cm / Ahg

/95-120 / cm / Bg

		iviatrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Salinity						
рН	Saturated Paste	рН	5.3	5.6	5.6	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.27	0.38	0.26	0.01
SAR	Saturated Paste		0.2	0.2	0.2	
% Saturation		%	199	76	50	
Calcium	Saturated Paste	meq/L	1.96	2.71	1.55	0.01
Calcium	Saturated Paste	mg/kg	78.0	41.0	15.6	
Magnesium	Saturated Paste	meq/L	0.71	1.17	0.74	0.02
Magnesium	Saturated Paste	mg/kg	17.0	10.7	4.5	
Sodium	Saturated Paste	meq/L	0.21	0.29	0.26	0.04
Sodium	Saturated Paste	mg/kg	10	5	3	
Potassium	Saturated Paste	meq/L	0.07	0.06	0.14	0.03
Potassium	Saturated Paste	mg/kg	5	2	3	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	

NWL Number 421431-94 Sample Date Oct 23, 2005

Sample Date Oct 23, 2005 Sample Description SN6 / 4455051023462

/ 95-120 / cm / Bg

Matrix

Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Agg	regate Properties					
Texture		Sa	andy Loam			
Sand	Soil Texture	% by weight	54.6			
Silt	Soil Texture	% by weight	28.8			
Clay	Soil Texture	% by weight	16.6			

Approved by:

Anthony Weumann Anthony Neumann, MSc

Laboratory Operations Manager



Quality Control

Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project

ID: 4455-514 **NAOS**

Location: Christina Lake

LSD: P.O.:

Acct. Code:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005
Date Reported: Feb 15, 2007

Report Number: 966613

Page: 29 of 33

Classification Blanks	Huita	Measured	Mean	Lauran Limit	Upper Limit	Passed QC
	Units			Lower Limit -1.0	• •	Passed QC
Calcium	mq/kq	6	0.0		1.0	✓
Magnesium	mg/kg	3	0.0	-0.5	0.5	√
Potassium	mg/kg	<20	0	-5	5	√ √
Sodium	mq/kq	<10	0.0	-3.0	3.0	
Ammonium - N	mg/kg	503	4.15	-2.87	11.17	✓
Material Used:	Edmonton Method Blank					
Date Acquired:	Feb 08, 2007					
Acquired By:	Gordon Grensmann					
Replicates	Units	Replicate1	Replicate2	% RSD Criteria	Absolute Criteria	Passed QC
Calcium	meq/100q	70.2	70.8	9.9900	0.0009	✓
Magnesium	meq/100g	7.2	7.2	9.9900	0.0024	✓
Sodium	meg/100g	0.3	0.3	9.990	0.009	✓
Potassium	meq/100g	3.5	3.5	9.990	0.009	✓
Cation Exchange Cap	pacity meg/100g	377	367	9.99	0.10	✓
Material Used:	Edmonton Duplicate					
Date Acquired:	Feb 08, 2007					
Acquired By:	Gordon Grensmann					
Carbon	% dry weight	<0.05	0.05	20.01	0.10	✓
Material Used:	FSJ Duplicate	10.03	0.03	20.01	0.10	
Date Acquired:	Feb 09, 2007					
Acquired By:	Deanna Turner					
Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Carbon	% dry weight	4.18	4.41	3.09	5.73	rasseu Q∪
Material Used:	2001 Farm Soil Standard	4.10	4.41	3.09	5.75	•
Date Acquired:	Feb 08, 2007					
Acquired By:	Alecia Honkanen					
Calcium	meg/100g	16.4	16.2000	6.4500	25.9500	✓
	meg/100g	8.61	13.8000	5.4000	22.2000	· ✓
Magnesium Sodium	meg/100g	6.98	6.600	2.550	10.650	· ✓
	meg/100g	0.56	0.532	0.202	0.862	· ✓
Potassium Cation Exchange Cap		32.4	31.50	16.50	46.50	· ✓
Material Used:	2003 CEC Standard	32.4	31.50	10.50	40.50	•
Date Acquired:	Feb 07, 2007					
•	Gordon Grensmann					
Acquired By: Total Nitrogen	Gordon Grensmann %	0.16	0.15	0.06	0.24	✓
Material Used:	S-2005-B	0.10	0.10	0.00	0.24	•
Date Acquired:	Feb 09, 2007					
•	Alison Zook					
Acquired By:	Alisuii Zuuk					



Quality Control

Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

T2P 0C5

Attn: Andre Peloquin

Calgary, AB, Canada

Sampled By: JB/NMCompany: Matrix

Project

4455-514 ID: NAOS Name:

Christina Lake Location: LSD:

P.O.:

Acct. Code:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005 Date Reported: Feb 15, 2007

Report Number: 966613

Page: 30 of 33

					rugo. 50 or s	33
Physical and Ag	ggregate Properties					
Replicates	Units	Replicate1	Replicate2	% RSD Criteria	Absolute Criteria	Passed QC
Sand	% by weight	UNDEFINED		10.0	0.1	✓
Silt	% by weight	UNDEFINED		10.0	0.1	✓
Clay	% by weight	UNDEFINED		10.0	0.1	✓
Material Used:	Edmonton Duplicate					
Date Acquired:	Feb 08, 2007					
Acquired By:						
Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Sand	% by weight	47.6	46.6	40.7	52.5	✓
Silt	% by weight	27.2	25.7	20.4	31.0	✓
Clay	% by weight	29.6	28.8	23.9	33.7	✓
Material Used:	2006-Physical Standard					

Date Acquired: Feb 08, 2007 Acquired By: Chris Miller



Quality Control

Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

(780) 438-5522 Phone: Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NMCompany: Matrix

Acquired By:

Byul Sim

Project

4455-514 ID: NAOS Name:

Christina Lake Location: LSD:

P.O.:

Acct. Code:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005 Date Reported: Feb 15, 2007

Report Number: 966613

					Page: 31 of 3	33
Salinity						
Blanks	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Calcium	mg/L	<0.2	0.0	-0.2	0.2	✓
Magnesium	mq/L	<0.2	0.0	-0.8	0.7	✓
Sodium	mq/L	<1	0	-1	1	✓
Potassium	mq/L	<1	0.1	-0.4	0.5	✓
Material Used:	Edmonton Method Blank					
Date Acquired:	Feb 13, 2007					
Acquired By:	Bvul Sim					
Replicates	Units	Replicate1	Replicate2	% RSD Criteria	Absolute Criteria	Passed QC
рН	Нq	5.4	5.5	0.3	0.3	✓
Electrical Conductivity	dS/m at 25 C	1.05	1.07	9.99	0.01	✓
Calcium	mq/kq	810	892	10.0	0.6	✓
Sodium	mg/kg	32	38	10	1	✓
Potassium	mq/kq	717	687	10	1	✓
Material Used:	Edmonton Duplicate					
Date Acquired:	Feb 07, 2007					
Acquired By:	Byul Sim					
Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
рН	На	7.9	7.5	6.0	9.0	✓
Electrical Conductivity	dS/m at 25 C	5.72	5.70	3.57	7.83	✓
% Saturation	8	77	74	67	81	✓
Calcium	mg/L	93.6	71.1	39.0	103.2	✓
Magnesium	mg/L	19.0	14.8	5.9	23.7	✓
Sodium	mg/L	1300	1133	719	1547	✓
Potassium	mg/L	<10	5.7	2.4	9.1	✓
Material Used:	2006 Salinity Standard					
Date Acquired:	Feb 13, 2007					



Methodology and Notes

Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: JB/NM

Company: Matrix

Project ID:

4455-514

Name:

NAOS

Location: Christina Lake

LSD:

P.O.:

Acct. Code:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005 Date Reported: Feb 15, 2007

Report Number: 966613

Page: 32 of 33

Method	of	Anal	lysis:
--------	----	------	--------

motriou or raidiyolo.					
MethodName	Reference		Method	Date Analysis Started	Location
Carbon and Nitrogen in soil (FSJ)	SSSA Book Series 5	*	Total Carbon, Organic Carbon, and	9-Feb-07	Norwest Labs Fort St.
			Organic Matter, Ch 34		John
Carbon and Nitrogen in soil (FSJ)	SSSA Book Series 5	*	Total Carbon, Organic Carbon, and	12-Feb-07	Norwest Labs Fort St.
			Organic Matter, Ch 34		John
Cation Exchange Capacity (CEC) -	McKeague	*	CEC and Exchangeable Cations by	9-Feb-07	Norwest Labs Edmonton
Ammonium			NH4OAc at pH 7, 3.32		
Cation Exchange Capacity (CEC)	McKeague	*	CEC and Exchangeable Cations by	8-Feb-07	Norwest Labs Edmonton
for General Soil			NH4OAc at pH 7, 3.32		
Cation Exchange Capacity (CEC)	McKeague	*	CEC and Exchangeable Cations by	9-Feb-07	Norwest Labs Edmonton
for General Soil			NH4OAc at pH 7, 3.32		
Particle Size Analysis - GS	Carter	*	Hydrometer Method, 47.3	8-Feb-07	Norwest Labs Edmonton
Particle Size Analysis - GS	Carter	*	Hydrometer Method, 47.3	9-Feb-07	Norwest Labs Edmonton
Particle Size Analysis - GS	Carter	*	Hydrometer Method, 47.3	13-Feb-07	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	EC of Saturated Soil Paste, 4.13	8-Feb-07	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	EC of Saturated Soil Paste, 4.13	13-Feb-07	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	pH of Saturated Soil Paste, 3.14	8-Feb-07	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	pH of Saturated Soil Paste, 3.14	13-Feb-07	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	Soluble Salts in Saturation Extract, 3.21	8-Feb-07	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	Soluble Salts in Saturation Extract, 3.21	13-Feb-07	Norwest Labs Edmonton



Methodology and Notes

Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 **Fax:** (780) 438-0396

Bill to: Matrix Solutions Inc. **Report to:** Matrix Solutions Inc.

230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin

Sampled By: $JB/\!NM$

Company: Matrix

Project ID:

Name:

Location:

4455-514

NAOS

Christina Lake

LSD:

P.O.:

Acct. Code:

NWL Lot ID: 421431

Control Number: M 009708

Date Received: Nov 04, 2005 Date Reported: Feb 15, 2007

Report Number: 966613

Page:

33 of 33

* Norwest method(s) is based on reference method

References:

Carter Soil Sampling and Methods of Analysis

McKeague Manual on Soil Sampling and Methods of Analysis

SSSA Book Series 5 Methods of Soil Analysis, Part 3

Comments:

Client specified they would like the samples dryed and ground and then put on hold for further analysis.

PS1 analysis cancelled on the following samples: 1, 12-15,22,23,24,30,35,40,45,46,60,64,74,75,77,82 and 92 sample matrix was found to be peat.

This report was issued to include addition of salinites and particle size analysis requested by Susan McGillivray of Matrix on Feb. 12th. Report 966613 is an addendum to report 964596.

This report was issued to include addition of salinites, particle size, CEC, cations, and TKN analysis requested by Susan McGillivray of Matrix on Feb. 6th. Report 964596 is an addendum to report 776560.

This report was issued to include addition of TOC and % organic matter analysis requested by Susan McGillivray of Matrix on Feb. 6th. Report 964602 is an addendum to report 964596.



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID:

4455-514

Name: NAOSC EIA

Location: Corner and Lesimer

LSD:

P.O.:

Acct. Code:

NWL Lot ID: 495268

M 015006 Control Number:

Date Received: Sep 25, 2006 Oct 04, 2006

Date Reported: 909487 Report Number:

Page: 1 of 14

NWL Number Sample Date

Sample Description

495268-1 Sep 21, 2006 MLD /

495268-2 Sep 21, 2006 KWS Of /

495268-3 Sep 21, 2006 KWS Ae /

4455060921301 / 0-40 / cm

4455060921302 / 0-5 / 4455060921303 / 0-5 /

cm Matrix Soil Soil Soil

		IVIALIA	3011	3011 30		411	
Analyte		Units	Results	Results	Results	Detection Limi	
Classification							
Total Nitrogen	TKN	%	1.43	0.69	0.10	0.01	
Calcium	Cations	mg/kg	9190	8450	845	4	
Magnesium	Cations	mg/kg	1060	700	77	2	
Potassium	Cations	mg/kg	1000	300	90	20	
Sodium	Cations	mg/kg	130	<60	<10	12	
Base saturation		%	80	71	47	1	
Calcium		meq/100g	45.9	42.2	4.22	0.0003	
Magnesium		meq/100g	8.72	5.8	0.64	0.0008	
Sodium		meq/100g	0.56	<0.3	<0.05	0.003	
Potassium		meq/100g	2	0.8	0.2	0.003	
ESP		%	0.78	<0.4	<0.5	0.2	
TEC		meq/100g	58	49	5	2	
Cation Exchange Capacity		meq/100g	71.6	69.0	10.8		
Organic Matter		%	75	86	4	1	
Carbon	Total Organic	%	37.5	42.8	1.85	0.05	
Salinity							
pH	Saturated Paste	рН	6.1	5.8	5.3		
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.32	0.09	0.11	0.01	
SAR	Saturated Paste		0.6	0.1	0.1		
% Saturation		%	544	702	62		
Calcium	Saturated Paste	meq/L	1.02	0.67	0.55	0.01	
Calcium	Saturated Paste	mg/kg	111	94.0	6.9		
Magnesium	Saturated Paste	meq/L	0.49	0.25	0.25	0.02	
Magnesium	Saturated Paste	mg/kg	32.6	21.0	1.9		
Sodium	Saturated Paste	meq/L	0.53	0.05	0.09	0.04	
Sodium	Saturated Paste	mg/kg	67	9	1		
Potassium	Saturated Paste	meq/L	1.22	0.19	0.15	0.03	
Potassium	Saturated Paste	mg/kg	258	51	4		
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1		



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID: 4455-514

Name: NAOSC EIA

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

NWL Lot ID: 495268

Control Number: M 015006

Date Received: Sep 25, 2006

Date Reported: Oct 04, 2006 Report Number: 909487

Page: 2 of 14

495268-5

NWL Number Sample Date 495268-3 Sep 21, 2006

cm

Soil

495268-4 Sep 21, 2006

p 21, 2006 Sep 21, 2006 KWS Bt / KWS Ck /

Sample Description

Matrix

KWS Ae / 4455060921303 / 0-5 /

4455060921304 / 5-46 / cm Soil 4455060921305 / 46-120 / cm Soil

Analyte Units Results Results Results **Detection Limit Physical and Aggregate Properties** Texture Sandy Loam Sandy Clay Sandy Clay Loam Loam Sand Soil Texture % by weight 55.4 47.4 49.4 Silt Soil Texture % by weight 36.6 27.6 27.0 Clay Soil Texture % by weight 8.0 25.0 23.6



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID:

4455-514

Name: NAOSC EIA

Location: Corner and Lesimer

LSD:

P.O.:

Acct. Code:

NWL Lot ID: 495268

M 015006 Control Number:

Date Received: Sep 25, 2006 Oct 04, 2006

Date Reported:

909487 Report Number:

Page: 3 of 14

495268-6

NWL Number Sample Date Sample Description

495268-4 Sep 21, 2006 KWS Bt / 4455060921304 /

495268-5 Sep 21, 2006 KWS Ck / 4455060921305 / 46-120 / cm

Sep 22, 2006 MIL Of / 4455060922301 / 0-10 / cm

5-46 / cm

		Matrix Soil Soil		Soil		
Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.05	0.04	0.45	0.01
Calcium	Cations	mg/kg	1500	4730	2600	4
Magnesium	Cations	mg/kg	220	303	530	2
Potassium	Cations	mg/kg	100	80	3000	20
Sodium	Cations	mg/kg	<10	<10	<60	12
Base saturation		%	52	188	34	1
Calcium		meq/100g	7.47	23.6	13.0	0.0003
Magnesium		meq/100g	1.81	2.49	4.4	0.0008
Sodium		meq/100g	<0.05	<0.05	<0.3	0.003
Potassium		meq/100g	0.3	0.2	7.6	0.003
ESP		%	<0.3	<0.4	<0.4	0.2
TEC		meq/100g	10	26	25	2
Cation Exchange Capacity		meq/100g	18.3	14.0	74.2	
Organic Matter		%	1	1	86	1
Carbon	Total Organic	%	0.64	0.62	42.8	0.05
Salinity						
pH	Saturated Paste	pН	5.2	7.3	4.3	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.06	0.26	0.35	0.01
SAR	Saturated Paste		0.2	0.1	0.1	
% Saturation		%	46	55	1010	
Calcium	Saturated Paste	meq/L	0.22	1.91	1.16	0.01
Calcium	Saturated Paste	mg/kg	2.0	20.9	234	
Magnesium	Saturated Paste	meq/L	0.10	0.61	0.56	0.02
Magnesium	Saturated Paste	mg/kg	0.6	4.1	68.7	
Sodium	Saturated Paste	meq/L	0.10	0.13	0.11	0.04
Sodium	Saturated Paste	mg/kg	1	2	26	
Potassium	Saturated Paste	meq/L	0.07	<0.03	2.00	0.03
Potassium	Saturated Paste	mg/kg	1	<1	788	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID:

4455-514

Name: NAOSC EIA

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

NWL Lot ID:

495268 M 015006 Control Number:

Date Received: Sep 25, 2006

Oct 04, 2006 Date Reported: 909487 Report Number:

Page: 4 of 14

NWL Number Sample Date Sample Description

495268-7 Sep 22, 2006

495268-8 Sep 22, 2006 MIL Ae /

495268-9 Sep 22, 2006 MIL Bm /

WHK 15 Of / 4455060922300 / 0-4 / 4455060922302 / 0-6 / 4455060922303 / 6-14 / cm

Matrix Soil Soil Soil

Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.59	0.04	0.02	0.01
Calcium	Cations	mg/kg	6680	1150	886	4
Magnesium	Cations	mg/kg	660	170	130	2
Potassium	Cations	mg/kg	1700	20	20	20
Sodium	Cations	mg/kg	<60	<10	<10	12
Base saturation		%	52	81	89	1
Calcium		meq/100g	33.4	5.75	4.42	0.0003
Magnesium		meq/100g	5.4	1.4	1.1	0.0008
Sodium		meq/100g	<0.3	<0.05	<0.05	0.003
Potassium		meq/100g	4.4	0.06	0.06	0.003
ESP		%	<0.3	<0.6	<0.8	0.2
TEC		meq/100g	43	7	6	2
Cation Exchange Capacity		meq/100g	83.9	8.85	6.25	
Organic Matter		%	84	2	<1	1
Carbon	Total Organic	%	42.0	0.87	0.49	0.05
Salinity						
pH	Saturated Paste	рН	4.4	6.3	6.8	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.43	0.27	0.22	0.01
SAR	Saturated Paste		0.1	0.2	0.2	
% Saturation		%	926	32	32	
Calcium	Saturated Paste	meq/L	1.92	1.78	1.61	0.01
Calcium	Saturated Paste	mg/kg	355	11.3	10.3	
Magnesium	Saturated Paste	meq/L	0.64	1.01	0.80	0.02
Magnesium	Saturated Paste	mg/kg	71.3	3.9	3.1	
Sodium	Saturated Paste	meq/L	0.12	0.22	0.21	0.04
Sodium	Saturated Paste	mg/kg	26	2	2	
Potassium	Saturated Paste	meq/L	2.45	0.04	0.03	0.03
Potassium	Saturated Paste	mg/kg	884	<1	<1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID: 4455-514 **Name**: NAOSC EIA

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

NWL Lot ID: 495268

Control Number: M 015006

Date Received: Sep 25, 2006

Date Reported: Oct 04, 2006

Report Number: 909487

Page: 5 of 14

NWL Number Sample Date 495268-8 Sep 22, 2006 495268-9 Sep 22, 2006 495268-10 Sep 22, 2006

Sample Description

MIL Ae / 4455060922302 / 0-6 / MIL Bm / 4455060922303 / MIL Bc / 4455060922304 /

cm Matrix Soil 6-14 / cm Soil 14-120 / cm Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Aggreg	gate Properties					
Texture		S	Sandy Loam	Sandy Loam	Sandy Loam	
Sand	Soil Texture	% by weight	73.4	74.8	69.4	
Silt	Soil Texture	% by weight	19.6	18.2	17.0	
Clay	Soil Texture	% by weight	7.0	7.0	13.6	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project ID:

4455-514

Name: NAOSC EIA

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

NWL Lot ID: 495268

Date Received:

M 015006 Control Number:

Oct 04, 2006 Date Reported:

Sep 25, 2006

909487 Report Number:

Page: 6 of 14

NWL Number Sample Date Sample Description

495268-10 Sep 22, 2006 MIL Bc/ 4455060922304 /

14-120 / cm

495268-11 Sep 23, 2006 STP Of / 4455060923300 / 0-20 / cm

495268-12 Sep 23, 2006 STP BCa/ 4455060923001 / 20-120 / cm

		Matrix	Soil Soil		Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.03	0.88	0.06	0.01
Calcium	Cations	mg/kg	1050	1780	1880	4
Magnesium	Cations	mg/kg	190	560	619	2
Potassium	Cations	mg/kg	40	4000	100	20
Sodium	Cations	mg/kg	<10	<60	<10	12
Base saturation		%	82	26	89	1
Calcium		meq/100g	5.23	8.88	9.38	0.0003
Magnesium		meq/100g	1.6	4.6	5.09	0.0008
Sodium		meq/100g	<0.05	<0.3	<0.05	0.003
Potassium		meq/100g	0.1	10	0.3	0.003
ESP		%	<0.6	<0.3	<0.3	0.2
TEC		meq/100g	7	24	15	2
Cation Exchange Capacity		meq/100g	8.42	90.1	16.6	
Organic Matter		%	<1	88	2	1
Carbon	Total Organic	%	0.20	43.9	0.78	0.05
Salinity						
pH	Saturated Paste	рН	6.4	4.3	6.2	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.11	0.47	0.14	0.01
SAR	Saturated Paste		0.2	0.1	0.2	
% Saturation		%	28	874	54	
Calcium	Saturated Paste	meq/L	0.85	0.61	0.68	0.01
Calcium	Saturated Paste	mg/kg	4.8	107	7.3	
Magnesium	Saturated Paste	meq/L	0.39	0.48	0.54	0.02
Magnesium	Saturated Paste	mg/kg	1.3	50.8	3.5	
Sodium	Saturated Paste	meq/L	0.20	0.08	0.16	0.04
Sodium	Saturated Paste	mg/kg	1	16	2	
Potassium	Saturated Paste	meq/L	0.04	3.57	0.05	0.03
Potassium	Saturated Paste	mg/kg	<1	1220	1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID:

4455-514

Name: NAOSC EIA

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

NWL Lot ID: 495268

M 015006 Control Number:

Date Received: Sep 25, 2006

Oct 04, 2006 Date Reported:

909487 Report Number:

Page: 7 of 14

NWL Number Sample Date

Sample Description

495268-12 Sep 23, 2006

20-120 / cm

Sep 22, 2006 STP BCa / KWS Ae / 4455060923001 /

4455060922001 / 0-10 / cm Soil

495268-13

Sep 22, 2006 KWS Bt / 4455060922002/

495268-14

10-50 / cm Soil

		Matrix	Soil	Soil	Soi	<u> </u>
Analyte		Units	Results	Results	Results	Detection Limit
Physical and Aggi	regate Properties					 ,
Texture		Si	ilt Loam	Sandy Loam	Loam	
Sand	Soil Texture	% by weight	20.4	61.4	44.4	
Silt	Soil Texture	% by weight	53.2	34.2	36.6	
Clay	Soil Texture	% by weight	26.4	4.4	19.0	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Potassium

TGR

Saturated Paste

Saturated Paste

mg/kg

T/ac

Project ID:

4455-514

Name:

NAOSC EIA

Corner and Lesimer

LSD:

Location:

P.O.:

Acct. Code:

NWL Lot ID: 495268

Date Received:

M 015006 Control Number:

Oct 04, 2006 Date Reported:

Sep 25, 2006

909487 Report Number:

Page: 8 of 14

NWL Number Sample Date Sample Description

495268-13 Sep 22, 2006 KWS Ae / 4455060922001 /

495268-14 Sep 22, 2006 KWS Bt / 4455060922002 /

495268-15 Sep 22, 2006 KWS Bc/ 4455060922003 /

		Matrix	0-10 / cm Soil	44550609220027 10-50 / cm Soil	445506092 50-100 / Soil	cm cm
Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.03	0.02	0.03	0.01
Calcium	Cations	mg/kg	213	782	506	4
Magnesium	Cations	mg/kg	30	273	180	2
Potassium	Cations	mg/kg	50	80	30	20
Sodium	Cations	mg/kg	<10	<10	<10	12
Base saturation		%	43	50	52	1
Calcium		meq/100g	1.06	3.90	2.52	0.0003
Magnesium		meq/100g	0.25	2.24	1.5	0.0008
Sodium		meq/100g	<0.05	<0.05	<0.05	0.003
Potassium		meq/100g	0.1	0.2	0.08	0.003
ESP		%	<2	<0.4	<0.7	0.2
TEC		meq/100g	<2	6	4	2
Cation Exchange Capacity		meq/100g	3.33	12.6	7.87	
Organic Matter		%	1	<1	<1	1
Carbon	Total Organic	%	0.70	0.24	0.15	0.05
Salinity						
рН	Saturated Paste	рН	4.6	4.9	5.0	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.12	0.05	0.04	0.01
SAR	Saturated Paste		0.2	0.5	0.7	
% Saturation		%	57	36	29	
Calcium	Saturated Paste	meq/L	0.67	0.07	0.07	0.01
Calcium	Saturated Paste	mg/kg	7.7	0.5	0.4	
Magnesium	Saturated Paste	meq/L	0.31	0.07	0.07	0.02
Magnesium	Saturated Paste	mg/kg	2.1	0.3	0.2	
Sodium	Saturated Paste	meq/L	0.12	0.14	0.19	0.04
Sodium	Saturated Paste	mg/kg	2	1	1	
Potassium	Saturated Paste	meq/L	0.18	0.05	0.03	0.03

4

<0.1

<1

<0.1

<1

<0.1



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID: 4455-514 Name: NAOSC EIA

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

Matrix

NWL Lot ID: 495268

M 015006 Control Number:

Date Received: Sep 25, 2006

Oct 04, 2006 Date Reported:

909487 Report Number:

Page: 9 of 14

NWL Number Sample Date

Sample Description

495268-15 Sep 22, 2006 KWS Bc/

Soil

Sep 23, 2006 WNF Bm / 4455060922003 /

4455060923004 / 10-25 / cm

495268-16

Sep 23, 2006 WNF Bt / 4455060923005 / 25-55 / cm

495268-17

50-100 / cm Soil Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Aggr	egate Properties					
Texture		5	Sandy Loam	Silt Loam	Clay Loam	
Sand	Soil Texture	% by weight	70.0	18.0	25.4	
Silt	Soil Texture	% by weight	18.0	61.6	45.6	
Clay	Soil Texture	% by weight	12.0	20.4	29.0	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

4455-514

ID: Name: NAOSC EIA

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

NWL Lot ID: 495268

M 015006 Control Number:

Date Received: Sep 25, 2006 Oct 04, 2006 Date Reported:

909487 Report Number:

Page: 10 of 14

NWL Number Sample Date Sample Description

495268-16 Sep 23, 2006 WNF Bm / 4455060923004 /

10-25 / cm

Sep 23, 2006 WNF Bt / 4455060923005 / 25-55 / cm

495268-17

495268-18 Sep 23, 2006 WNF IIc/ 4455060923006 / 55-100 / cm

		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Detection Limit
Classification						
Total Nitrogen	TKN	%	0.05	0.04	0.07	0.01
Calcium	Cations	mg/kg	430	953	820	4
Magnesium	Cations	mg/kg	78	254	240	2
Potassium	Cations	mg/kg	60	90	80	20
Sodium	Cations	mg/kg	<10	<10	10	12
Base saturation		%	25	37	40	1
Calcium		meq/100g	2.15	4.76	4.09	0.0003
Magnesium		meq/100g	0.64	2.09	1.97	0.0008
Sodium		meq/100g	<0.05	<0.05	0.06	0.003
Potassium		meq/100g	0.2	0.2	0.2	0.003
ESP		%	<0.4	<0.3	0.4	0.2
TEC		meq/100g	3	7	6	2
Cation Exchange Capacity		meq/100g	11.7	18.9	15.6	
Organic Matter		%	1	<1	<1	1
Carbon	Total Organic	%	0.63	0.48	0.42	0.05
Salinity						
pH	Saturated Paste	рН	5.0	5.0	5.0	
Electrical Conductivity	Saturated Paste	dS/m at 25 C	0.07	0.05	0.07	0.01
SAR	Saturated Paste		0.2	0.4	0.5	
% Saturation		%	49	53	45	
Calcium	Saturated Paste	meq/L	0.32	0.12	0.20	0.01
Calcium	Saturated Paste	mg/kg	3.1	1.3	1.8	
Magnesium	Saturated Paste	meq/L	0.16	0.09	0.11	0.02
Magnesium	Saturated Paste	mg/kg	1.0	0.6	0.6	
Sodium	Saturated Paste	meq/L	0.12	0.12	0.20	0.04
Sodium	Saturated Paste	mg/kg	1	2	2	
Potassium	Saturated Paste	meq/L	0.06	0.05	0.08	0.03
Potassium	Saturated Paste	mg/kg	1	<1	1	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	



Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 (780) 438-0396 Fax:

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID: 4455-514 Name: NAOSC EIA

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

NWL Lot ID: 495268

M 015006 Control Number:

Date Received: Sep 25, 2006 Oct 04, 2006 Date Reported:

909487 Report Number:

Page: 11 of 14

NWL Number

495268-18

Sample Date

Sep 23, 2006

Sample Description

WNF IIc/ 4455060923006 /

55-100 / cm

Matrix Soil

Analyte		Units	Results	Results	Results	Detection Limit
Physical and Aggregate	e Properties					
Texture		Sa	ındy Loam			
Sand	Soil Texture	% by weight	57.4			
Silt	Soil Texture	% by weight	25.0			
Clay	Soil Texture	% by weight	17.6			

Approved by:

Anthony Neumann, MSc

Laboratory Operations Manager

nthony Weuman



Quality Control

Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc. Report to: Matrix Solutions Inc. 230, 319 - 2 Avenue S. W.

Calgary, AB, Canada T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID:

4455-514

NAOSC EIA Name:

Corner and Lesimer Location: LSD:

P.O.:

Acct. Code:

NWL Lot ID: 495268

Control Number: M 015006 Date Received: Sep 25, 2006

Date Reported: Oct 04, 2006

Report Number: 909487

Page: 12 of 14

Classification						
Blanks	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Calcium	mq/kq	7	0.0	-1.0	1.0	✓
Magnesium	mq/kq	<2	0.0	-0.5	0.5	✓
Potassium	mq/kq	<20	0	-5	5	✓
Sodium	mq/kq	<10	0.0	-3.0	3.0	✓
Ammonium - N	mq/kq	73.7	4.15	-2.87	11.17	✓
Material Used:	Edmonton Method Blank					
Date Acquired:	Sep 28, 2006					
Acquired By:	Gordon Grensmann					
Replicates	Units	Replicate1	Replicate2	% RSD Criteria	Absolute Criteria	Passed QC
Calcium	meq/100q	45.9	45.5	9.9900	0.0009	✓
Magnesium	meq/100g	8.72	8.71	9.9900	0.0024	✓
Sodium	meg/100g	0.56	0.51	9.990	0.009	✓
Potassium	meq/100g	2	2	9.990	0.009	✓
Cation Exchange Ca	pacity meg/100g	71.6	77.5	9.99	0.10	✓
Material Used:	Edmonton Duplicate					
Date Acquired:	Sep 28, 2006					
Acquired By:	Gordon Grensmann					
Carbon	%	0.49	0.48	20.01	0.10	✓
Material Used:	FSJ Duplicate					
Date Acquired:	Sep 29, 2006					
Acquired By:	Alecia Honkanen					
Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Carbon	%	4.32	4.41	3.09	5.73	✓
Material Used:	2001 Farm Soil Standard					
Date Acquired:	Sep 29, 2006					
Acquired By:	Alecia Honkanen					
Calcium	meg/100g	15.9	16.2000	6.4500	25.9500	✓
Magnesium	meg/100g	8.70	13.8000	5.4000	22.2000	✓
Sodium	meq/100q	7.11	6.600	2.550	10.650	✓
Potassium	meg/100g	0.54	0.532	0.202	0.862	✓
Cation Exchange Ca	pacity meg/100g	32.6	31.50	16.50	46.50	✓
Material Used:	2003 CEC Standard					
Date Acquired:	Sep 28, 2006					
Acquired By:	Gordon Grensmann					
Total Nitrogen	%	0.15	0.15	0.06	0.24	✓
Material Used:	S-2005-B					
	Oct 03, 2006					
Date Acquired:						



Quality Control

Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 Fax: (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W.

Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project

ID: 4455-514 **NAOSC EIA**

Location: Corner and Lesimer

LSD: P.O.:

Acct. Code:

NWL Lot ID: 495268

Control Number: M 015006

Date Received: Sep 25, 2006

Date Reported: Oct 04, 2006

Report Number: 909487

Page: 13 of 14

					. age.	
Physical and Agg	regate Properties					
Replicates	Units	Replicate1	Replicate2	% RSD Criteria	Absolute Criteria	Passed QC
Sand	% by weight	65.6	64.6	10.0	0.1	✓
Silt	% by weight	31.6	31.6	10.0	0.1	✓
Clay	% by weight	30.4	30.0	10.0	0.1	✓
Material Used:	Edmonton Duplicate					
Date Acquired:	Sep 28, 2006					
Acquired By:	Holly Fairbairn					
Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Sand	% by weight	47.2	46.6	40.7	52.5	✓
Silt	% by weight	25.2	25.7	20.4	31.0	✓
Clay	% by weight	29.4	28.8	23.9	33.7	✓
Material Used:	2006-Physical Standard					
Date Acquired:	Sep 28, 2006					
Acquired By:	Jessica Lam					
Salinity						
Blanks	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Calcium	mq/L	<0.2	0.4	-0.5	1.3	✓
Magnesium	mq/L	<0.2	0.1	-0.3	0.5	✓
Sodium	mq/L	<1	3	-2	8	✓
Potassium	mq/L	<1	0.1	-0.4	0.6	✓
Material Used:	Edmonton Method Blank					
Date Acquired:	Sep 28, 2006					
Acquired By:	Bvul Sim					
Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
рН	Нq	7.8	7.5	6.0	9.0	✓
Electrical Conductivity	dS/m at 25 C	4.95	5.70	3.57	7.83	✓
% Saturation	%	71	74	67	81	✓
Calcium	mq/L	63.6	71.1	39.0	103.2	✓
Magnesium	mq/L	11.8	14.8	5.9	23.7	✓
Sodium	mq/L	1200	1133	719	1547	✓
Potassium	mq/L	12	5.7	2.4	9.1	✓
Material Used:	2006 Salinity Standard					
Date Acquired:	Sep 28, 2006					
Acquired By:	Bvul Sim					



Methodology and Notes

Norwest Labs 7217 Roper Road NW Edmonton, AB. T6B 3J4

Phone: (780) 438-5522 **Fax:** (780) 438-0396

Bill to: Matrix Solutions Inc.

Report to: Matrix Solutions Inc.

230, 319 - 2 Avenue S. W. Calgary, AB, Canada

T2P 0C5

Attn: Andre Peloquin Sampled By: Kyle Hodgson

Company: Matrix

Project ID:

4455-514

Name: NAOSC EIA

Location: Corner and Lesimer

LSD:

P.O.:

Acct. Code:

NWL Lot ID: 495268

Control Number: M 015006

Date Received: Sep 25, 2006 Date Reported: Oct 04, 2006

Report Number: 909487

Page: 14 of 14

Method of Analysis:

,					
MethodName	Reference		Method	Date Analysis Started	Location
Carbon and Nitrogen in soil (FSJ)	SSSA Book Series 5	*	Total Carbon, Organic Carbon, and	2-Oct-06	Norwest Labs Fort St.
			Organic Matter, Ch 34		John
Cation Exchange Capacity (CEC) -	McKeague	*	CEC and Exchangeable Cations by	29-Sep-06	Norwest Labs Edmonton
Ammonium			NH4OAc at pH 7, 3.32		
Cation Exchange Capacity (CEC)	McKeague	*	CEC and Exchangeable Cations by	29-Sep-06	Norwest Labs Edmonton
for General Soil			NH4OAc at pH 7, 3.32		
Particle Size Analysis - GS	Carter	*	Hydrometer Method, 47.3	28-Sep-06	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	EC of Saturated Soil Paste, 4.13	28-Sep-06	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	EC of Saturated Soil Paste, 4.13	28-Sep-06	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	pH of Saturated Soil Paste, 3.14	28-Sep-06	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	pH of Saturated Soil Paste, 3.14	28-Sep-06	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	Soluble Salts in Saturation Extract, 3.21	28-Sep-06	Norwest Labs Edmonton
Saturated Paste in General Soil	McKeague	*	Soluble Salts in Saturation Extract, 3.21	28-Sep-06	Norwest Labs Edmonton

^{*} Norwest method(s) is based on reference method

References:

Carter Soil Sampling and Methods of Analysis

McKeague Manual on Soil Sampling and Methods of Analysis

SSSA Book Series 5 Methods of Soil Analysis, Part 3

Comments:

Particle size analysis could not be performed on samples 1, 2, 6, 7 and 11 as these samples were a peat matrix.



NORWEST Confirmation of Analysis

Lot: 470192

Number of Samples: 125
Printed Date: Jun 15, 2006

Norwest Labs Edmonton

7217 Roper Road NW Edmonton, AB Canada T6B 3J4

Tel: (780) 438-5522 Fax: (780) 438-0396 (800) 661-7645

Main Contact: Primary Administrator Contact: Bill Paid by: Attn: Andre Peloquin Attn: Andre Peloquin Attn: Marim Halat Matrix Solutions Inc. Matrix Solutions Inc. Matrix Solutions Inc. 230, 319 - 2 Avenue S. W. 230, 319 - 2 Avenue S. W. 230, 319 - 2 Avenue S. W. Calgary, AB T2P 0C5 Calgary, AB T2P 0C5 Calgary, AB T2P 0C5 Phone: (403) 237-0606 Phone: (403) 237-0606 Phone: (403) 237-0606 Fax: (403) 263-2493 Fax: (403) 263-2493 Fax: (403) 263-2493

Agreement Id	15610 Project Id	4706-514	PO #
Project Name	Nexen Longlake EIA	Project Location	
Project Accounting	Code	Project LSD	

Control ID: M 013602 Sampled by: NM/SM

Completion Date: 15-Jun-2006 Company: Matrix Solutions

Received Date: 12-Jun-2006

Other Billable Services	Service	Service Name	Quantity

		Sample D	escriptors	Service	Service Name
Priority:	1 1895128 Normal 05-Jun-2006 Grab	Sample depth Sample depth UOM Sample Description Site I.D.	15-0 cm 476060605100 SM02-LFH	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
	2 1895229 Normal 05-Jun-2006 Grab	Sample depth Sample depth UOM Sample Description Site I.D.	0-14 cm 476060605101 SM02-Ae	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold

Sample Id: Priority:	108 1895335 Normal	Sample depth Sample depth UOM	0-20 cm	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Date Sampled: Time Sampled: Sampling Methor Sample Location		Sample Description Site I.D.	4/6060605311 KH9-Om	Nobb	
Sample Id: Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	20-66 cm 476060605312 KH9-Om	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	66-120 cm 476060605313 KH9-Bg	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.		05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Sample Id: Priority: Date Sampled: Time Sampled: Sampling Methor Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.		05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	10-0 cm 476060605316 KH12-LFH	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Sample Id: Priority: Date Sampled: Time Sampled: Sampling Methor Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	0-4 cm 476060605317 KH12-Ahe	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold

Sample Id: Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	4-28 cm 476060605318 KH12-Ae	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Sample Id: Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	28-53 cm 476060605319 KH12-Bt	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Priority: Date Sampled: Time Sampled: Sampling Method Sample Location	:	Sample depth Sample depth UOM Sample Description Site I.D.	53-120 cm 476060605320 KH12-BC	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	5-0 cm 476060606321 KH5-LFH	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	0-16 cm 476060606322 KH5-Ahe/Ae	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Priority: Date Sampled: Time Sampled: Sampling Method Sample Location	:	Sample depth Sample depth UOM Sample Description Site I.D.	16-25 cm 476060606323 KH5-Bm	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold
Priority: Date Sampled: Time Sampled: Sampling Method Sample Location		Sample depth Sample depth UOM Sample Description Site I.D.	25-50 cm 476060606324 KH5-Bt	05 DISP HOLD	Drying and Grinding Disposal of Soil/Water Sample Hold

Appendix 10A Concordance of Alberta Wetland (AWI) Classification with Ecosite Phase Classification of Beckingham and Archibald (1996) for Terrestrial and Wetland Communities

Land Group		Archibald Ecosite hase	AWI		
Land Group	Central Mixedwood	Lower Boreal Highland	AWI		
Terrestrial	a1	a1	n/a		
	b1	b1	n/a		
	b2	n/a	n/a		
	b3	b2	n/a		
	b4	b3	n/a		
	c1	c1	n/a		
	d1	d1	n/a		
	d2	d2	n/a		
	d3	d3	n/a		
	d4	n/a	n/a		
	e2	n/a	n/a		
	e3	e1	n/a		
	f1	n/a	n/a		
	f2	n/a	n/a		
	f3	f1	n/a		
	g1	g1	n/a		
	h1	n/a	n/a	_	
Wetland			Wetland	Peatland	
	h1	n/a	Swamp (SFNN, STNN)	NO	
	i1	h1	Treed Bog (BFXC, BFXN,BTNI, BTNN, BTNR, BTXC, BTXN)	YES	
	i2	h2	Shrubby Bog (BONS, BOXC, BOXN)	YES	
	j1	i1	Treed Fen (FTNI, FTNN, FTNR, FTPN)	YES	
	j2	i2	Shrubby Fen (FONG, FONS, FOPN)	YES	
	k1	j1	Treed Fen (FTNI, FTNN, FTNR, FTPN)	YES	
	k2	j2	Shrubby Fen (FONG, FONS, FOPN)	YES	
	k3	ј3	Graminoid Fen (FONG)	YES	
	l1	n/a	Marsh (MONG)	NO	
	n/a	n/a	Shrubby Swamp (SONS)	NO	
	n/a	n/a	Shallow Open Water (WONN)	NO	

Central Mixedwood Ecosite Phase Descriptions

Ecosite	
Phase	Description
a1	Upland - Coniferous forest of Jack pine (<i>Pinus banksiana</i>). Shrub species include Blueberry (<i>Vaccinium myrtilloides</i>), Bearberry (<i>Arctostaphylos uva-ursi</i>), Bog cranberry (<i>Vaccinium vitis-idaea</i>), and Sand heather (<i>Hudsonia tomentosa</i>). Reindeer lichen (<i>Cladina</i> species) and other lichens carpet the forest floor. This ecosite has dry moisture conditions, rapidly drained, sandy, usually acidic soil (Brunisols), and poor nutrient status.
b1	Upland - Mixedwood forest of Jack pine (<i>Pinus banksiana</i>), and Aspen (<i>Populus tremuloides</i>). Some White birch (<i>Betula papyrifera</i>) may also be present. Shrub species include Blueberry (<i>Vaccinium myrtilloides</i>), Labrador tea (<i>Ledum groenlandicum</i>), and Prickly rose (<i>Rosa acicularis</i>). Ground cover is typically composed of Bog cranberry (<i>Vaccinium vitis-idaea</i>), Bearberry (<i>Arctostaphylos uva-ursi</i>), Twin-flower (<i>Linnaea borealis</i>), and Feather mosses. Reindeer lichen (<i>Cladina</i> species) may also be present. Underlying soils (Brunisols, Luvisols) associated with this ecosite phase can be fine to coarse sands or gravels, and glacial till (a mixture ranging from clay to boulders). Moisture conditions and nutrient conditions are dry to moderate and poor to medium respectively.
b2	Upland - Deciduous forest of Aspen (<i>Populus tremuloides</i>) and White birch (<i>Betula papyrifera</i>). White spruce (<i>Picea glauca</i>) may also be present. Shrub species include Bearberry, Labrador tea, Blueberry, Green alder, Bog cranberry, Prickly rose and Twin-flower. Feather mosses may be present. Underlying soils (Brunisols, Luvisols) associated with this ecosite phase can be fine to coarse sands or gravels, and glacial till (a mixture ranging from clay to boulders). Moisture conditions range from slightly dry to slightly moist and the nutrient regime ranges from poor to rich.
b3	Upland - Mixedwood forest of Aspen and White spruce. White birch and Jack pine may be present, usually <10% of canopy cover. Shrubs include Blueberry, Bearberry, Bog cranberry, Prickly rose, and occasionally Green alder (<i>Alnus crispa</i>). Underlying soils (Brunisols, Luvisols) associated with this ecosite phase can be fine to coarse sands or gravels, and glacial till (a mixture ranging from clay to boulders). Moisture conditions range from slightly moist to moist. The nutrient regime ranges from poor to medium.
b4	Upland - Coniferous forest of White spruce (<i>Picea glauca</i>) and Jack pine. White birch and Aspen may be present. Shrubs include Bearberry, Blueberry, Prickly rose, Labrador tea, and Saskatoon (<i>Amelanchier alnifolia</i>). Ground cover species may include Bunchberry (<i>Cornus canadensis</i>), wild lily-of-the-valley (<i>Maianthemum canadense</i>), Hairy wild rye (<i>Elymus innovatus</i>), Feather mosses and Reindeer lichens. Associated soils may be composed of coarse sands, gravels, rock and/or lake deposited sediment (Brunisols and Luvisols). The moisture regime ranges from dry to moderate and nutrient conditions range from poor to medium.
c1	Upland - Coniferous forest of Jack pine and Black spruce (<i>Picea mariana</i>). Shrubs consist of Labrador tea and Blueberry, and the ground cover is typically Bog cranberry, Feather mosses and Reindeer lichen. Labrador tea and Bog cranberry are indicative of acidic surface soil conditions. Associated soils (Brunisols, Luvisols) may be coarse sands and gravels, and glacial till. Moisture conditions range from slightly dry to slightly moist and it has a nutrient poor substrate.
d1	Upland - Deciduous forest composed mainly of Aspen. Balsam poplar (<i>Populus balsamifera</i>), White birch and White spruce may also be present. Shrubs that may be present include Prickly rose, Low-bush cranberry (<i>Viburnum edule</i>), Canada buffaloberry (<i>Shepherdia canadensis</i>), Beaked hazelnut (<i>Corylus cornuta</i>), and Saskatoon. Ground cover is typically composed of Twin-flower, Wild sarsaparilla (<i>Aralia nudicalis</i>), Bunchberry, Fireweed (<i>Epilobium angustifolium</i>), Marsh reed grass (<i>Calamagrostis canadensis</i>) and Hairy wild rye. Soils may be coarse sands and gravels, glacial till, or lake deposited sediment (Luvisols). It has a moderate moisture regime and a medium nutrient regime.
d2	Upland - Mixedwood forest of Aspen and White spruce. Balsam poplar, White birch, Balsam fir (Abies balsamea) and Black spruce may be present. Shrubs include Low-bush cranberry, Prickly rose, Canada buffaloberry, Saskatoon, Beaked hazelnut, Pin cherry (Prunus pensylvanica) and Choke cherry (Prunus virginiana). Ground cover species include Bunchberry, Wild sarsaparilla, Dewberry (Rubus pubescens), Fireweed, Marsh reed grass, Hairy wild rye and Feather mosses. Associated soils (Luvisols, Brunisols) are coarse sands and gravels, glacial till and lake deposited sand, silt or clay. Moisture is moderate and nutrient conditions are medium.
d3	Upland - Coniferous forest of White spruce (<i>Picea glauca</i>). Balsam fir, Aspen, White birch, Balsam poplar and Black spruce may also be present. Shrub species include Twin-flower, Low-bush cranberry, Prickly rose, Green alder and Buffaloberry. Soils may be coarse sands and gravels, glacial till, or lake deposited sediment (Luvisols). Moisture is moist to slightly wet and the Nutrient Regime ranges from poor to rich.
e1	Upland - Deciduous forest of Balsam poplar and Aspen. White birch and White spruce may be present in small percentages. Occassionally in some sites White birch may be dominant. Dogwood is the characteristic shrub species. Other shrubs may include Prickly rose, Low-bush cranberry, Bracted honeysuckle, Green and River alder, Willow, Currants, Red raspberry. Although an upland site the moisture regime is moist to slightly wet because they typically occur in lower slope positions or near water courses, seepages or flood waters. They are often old-growth forests due to fire skips. Underlying soil conditions are water deposited sediment (Gleysols, Luvisols). The nutrient regime is medium to rich and is a highly productive site.
e2	Upland - Mixedwood forest of Balsam poplar and White spruce. Aspen, White birch and Balsam fir may also be present. Shrub species include Dogwood, Low-bush cranberry, Prickly rose, Currant, Red raspberry. Wild sarsaparilla, Dewberry, Bunchberry and Horsetail and Feather mosses are typical understorey species. Although an upland site the moisture regime is moist to slightly wet because they typically occur in lower slope positions or near water courses, seepages or flood waters. They are often old-growth forests due to fire skips. Associated soils include glacial deposit till (mixture ranging from clay to boulders, lake and flowing water deposit sediment, post-glacial deposit of fine sand, silt or clay in lakebed (Gleysols, Luvisols). The nutrient regime is medium to rich and is a highly productive site.
e3	Upland - Coniferous forest of White spruce. Balsam fir, Balsam poplar, White birch and Aspen may also be present. Shrub species include Low-bush cranberry, Prickly rose, Alder, and Currants. Although an upland site the moisture regime is moist to slightly wet because they typically occur in lower slope positions or near water courses, seepages or flood waters. They are often old-growth forests due to fire skips. Associated soils include glacial deposit till (mixture ranging from clay to boulders, lake and flowing water deposit sediment, post-glacial deposit of fine sand, silt or clay in lakebed [Gleysols, Luvisols]). The nutrient regime is medium to rich and is a highly productive site.
f1	Upland - Deciduous forest of Aspen and Balsam poplar. White birch and White spruce may also be present. Characteristic of these sites are the presence of Horsetails in the understorey. Typical shrubs include Willow, Prickly rose, Alder and Dogwood. Although an upland site, the moisture regime is moist to wet because they typically occur in lower slope positions or near water courses, seepages or flood waters. Associated soils may consist of rock, lake deposit sediment, slumps (Regosols, Gleysols). Nutrient regime is medium to very rich.
f2	Upland - Mixedwood forest of White spruce and Birch. Balsam poplar, Aspen and Balsam fir may also be present. Characteristic of these sites are the presence of Horsetails in the understorey. Typical shrubs include Willow, Prickly rose, Dogwood and Low-bush cranberry Although an upland site, the moisture regime is moist to wet because they typically occur in lower slope positions or near water courses, seepages or flood waters. Associated soils may be composed of lake and flowing water deposit of sediment, glacial deposit course sands and gravels, water deposit sediment (Gleysols). Nutrient regime is medium to rich.

Central Mixedwood Ecosite Phase Descriptions

Ecosite	
Phase	Description
f3	Upland - Coniferous of White spruce. Balsam fir, Aspen, Balsam poplar and White birch may be present but <10 % of canopy cover. Characteristic of these sites is Horsetails in the understorey. Shrubs include Twin-flower, Prickly rose, Low-bush cranberry and Currants. Although an upland site, the moisture regime is moist to wet because they typically occur in lower slope positions or near water courses, seepages or flood waters. Underlying soils may be composed of glacial deposit till (mixture ranging from clay to boulders), lake and flowing water deposit sediment, glacial deposit course sands and gravels (Gleysols). Nutrient status is medium to rich.
g1	Upland - Coniferous forest of Black spruce and Jack pine. Shrubs consist of Labrador tea and Blueberry. Prickly rose may also be present. Ground cover species include Bog cranberry, Twin-flower, Feather mosses and Peat mosses (<i>Sphagnum</i> species). Reindeer lichen may or may not be present. Labrador tea, Blueberry and Bog cranberry indicate acidic surface soil conditions. This ecosite phase tends to be found at lower topographic positions, has high soil water content and is imperfectly to very poorly drained. Associated soils include glacial deposit till (mixture ranging from clay to boulders), accumulation of organic matter, glacial deposit course sands and gravels, and lake deposit sediment (Gleysols, Luvisols). Nutrient regime is poor.
h1	Upland - Coniferous forest of White spruce and Black spruce. A very small percentage of White birch and Tamarack may be present. Shrubs include Labrador tea, Bog cranberry, Willow, Prickly rose and Twin-flower. Horsetails are common in the understorey as are mosses due to the high moisture content. These sites are located in lower slope positions and therefore have medium to wet moisture conditions. Associated soils include lake and flowing water deposit of sediment, and glacial deposit of course sands, gravels and till (mixture ranging from clay to boulders), postglacial deposit of sand, silt or clay on a lake bed (Gleysols, Luvisols). Nutrient condition is poor to rich.
	Wetlands and Peatlands
	Bogs
	Wetland - Treed bog with Black spruce. Bogs are peatlands that develop in small basins and depressions with hummocky terrain and restricted water flow. They can also form in fen complexes and along drainage divides. They receive water only from precipitation. The dominant tree species is Black spruce. Ground cover typically includes Labrador tea, Bog cranberry, Cloudberry (<i>Rubus chamaemorus</i>), Peat mosses, Feather mosses and Reindeer lichen. These peatland areas have organic soils, acidic conditions and slow decomposition. Typically they are poor to very poorly drained and have very poor nutrient conditions. Peat accumulation in these areas is enhanced by poor drainage, high water tables, acidic conditions and slow decomposition. Growth and successional rates are slow which results in slow recovery rates from disturbance. Soils are organic.
i2	Wetland - Shrubby bog. Open shrubby bog with sparse Black spruce and Bog birch. Organic material or organic material over lake deposit sediment. Permafrost may be present at some sites.
j1	Wetland - Treed fen with Tamarack (<i>Larix laricina</i>) and Black spruce. Fens are peatlands affected by mineral ground and/or surface water and have water levels at or near the surface. The nutrient regime in fens can range from poor to rich resulting in different assemblages of plant species. Changes in water flow can result in changes in species assemblages. Poor fens have fewer indicator species than do rich fens. Poor fens are acidic (pH 4.5-5.5), low in base cations (Ca, Mg, K, Na) and have no or very low alkalinity (HCO ₃). The dominate tree species is Black spruce. Other trees and shrubs that may be present include Tamarack, Willow, White birch and Bog birch. Ground cover consists mainly of sedges, grasses, Feather mosses, Golden mosses and Sphagnum mosses. Recovery from disturbance is slow. Rich fens have flowing water, a more basic pH (6-7), high alkalinity and are high in base cations. They have similar tree and shrub species; however, Tamarack is the dominant tree species instead of Black spruce. Ground cover is similar to that of poor fens with the exception that Golden and Brown mosses are dominant. Recovery from disturbance is slow. This wetland type is home to many of Alberta's rare plant species.
j2	Wetland - Poor shrubby fen. Generally flat or sloping gently in the direction of drainage. Shrubs include Bog birch and Willow. Black spruce may appear as a shrub. Surface water is often present. Generally composed of organic material, glacial deposit till (mixture ranging from clay to boulders). Soils organic or mineral.
k1	Wetland - Treed fen with Tamarack (<i>Larix laricina</i>) and Black spruce. Fens are peatlands affected by mineral ground and/or surface water and have water levels at or near the surface. The nutrient regime in fens can range from poor to rich resulting in different assemblages of plant species. Changes in water flow can result in changes in species assemblages. Poor fens have fewer indicator species than do rich fens. Poor fens are acidic (pH 4.5-5.5), low in base cations (Ca, Mg, K, Na) and have no or very low alkalinity (HCO ₃). The co-dominate tree species are Tamarack and Black spruce. Other trees and shrubs that may be present include Willow, White birch and Bog birch. Ground cover consists mainly of sedges, grasses, Feather mosses, Golden mosses and Sphagnum mosses. Recovery from disturbance is slow. Rich fens have flowing water, a more basic pH (6-7), high alkalinity and are high in base cations. They have similar tree and shrub species; however, Tamarack is the dominant tree species. Ground cover is similar to that of poor fens with the exception that Golden and Brown mosses are dominant. Recovery from disturbance is slow. This wetland type is home to many of Alberta's rare plant species.
k2	Wetland - Open rich shrubby fen. Generally flat or sloping gently in the direction of drainage. Shrubs include Bog birch and Willow. Tamarack may appear as a shrub. Surface water is often present. Generally composed of organic material, glacial deposit till (mixture ranging from clay to boulders). Soils organic or mineral.
k3	Wetland - Grassy fen. These fens are peatland with low percent cover of shrubs and are dominated by graminoids with a high cover of sedges (Carex spp.). They can be poor to rich in nutrients. They often occur as collapse scars or adjacent to non-peat forming wetlands such as marshes or shallow open water. Soils are organic or mineral.
I1	Wetland - Graminoid (Sedges and Grasses) marsh. Marshes are characterized by frequent flooding and fluctuating water levels. They are located adjacent to shallow open water bodies, lakes and streams. Due to relatively greater water fluctuations and faster flowing water, mosses and shrubs do not readily establish. The resulting and characteristic vegetation is grasses, sedges (<i>Carex</i> species), rushes and reeds (<i>Juncas</i> and <i>Scirpus</i> species) and often cattail (<i>Typha latifolia</i>). Nutrient regime is rich due to decomposition of organic matter and therefore vascular plant production is much greater than in fens and bogs. Marshes are not considered as peatlands because high decomposition rates do not allow for peat accumulation. Lack of shrub cover and greater water fluctuations differentiate marshes from swamps.

Table 10C-1 Provincial Community Conservation Ranks

Alberta Rank	Rank Description
S1	5 or fewer occurrences or very few remaining hectares.
S2	6 to 20 occurrences or few remaining hectares.
S3	21 to 80 occurrences. May be rare and local throughout its range or found locally, even abundantly, in a restricted range (e.g., a single western province or a physiographic region in the East).
S4	Apparently secure globally (State/Province wide), though it may be quite rare in parts of its range, especially at the periphery.
S5	Demonstrably secure globally (State/Province wide), though it may be quite rare in parts of its range, especially at the periphery.
SNR	Element is not yet ranked.
SNU	Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA	Not Applicable —A conservation status rank is not applicable because the element is not a suitable target for conservation activities.
S#S#	Range Rank* —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
Modifiers	
Q	Can be added to any global rank to denote questionable taxonomy (e.g., G2Q = 6 to 20 known occurrences, but questions exist concerning the classification of this type). Cannot be used with provincial ranks.
?	Can be added to any rank to denote an inexact numeric rank (e.g., S1? = Believed to be 5 or less occurrences, but some doubt exists concerning status).

Notes:

Source: ANHIC website, May 2006



^{*} Ranks can be combined to indicate a range (e.g., S2S3 = May be between 6 to 80 occurrences throughout Alberta, but the exact status is uncertain). Combined ranks indicate a larger margin of error than ranks assigned a "?" qualifier.

Appendix 10D Summary of Plot Type and Frequency by Ecosite Phase

	Plot	Туре	
Ecosite Phase/Transition	Meander	Plot	Grand Total
a1	4	2	6
b1	4	2	6
b1-c1 (Transition)	1		1
b1-h1(Transition)	1		1
b3		1	1
BU	1		1
c1	29	6	35
c1-g1(Transition)	3		3
c1-h1(Transition)	3		
d1	7	5	12
d1-h1(Transition)	1		1
d2	8	7	15
d3	2	2	4
disturbance	8		8
e1	2	1	3
g1	14	6	20
g1-h1(Transition)	3		3 2
g1-i1(Transition)	2		
h1	34	3	37
h1-i1(Transition)	1		1
h1-j1(Transition)	1		1
h2	2	1	3
i1	13	1	14
i2	1	1	2
j1	25	7	32
j2	8	2	10
ј3	5	1	6
Grand Total	183	48	231

Appendix E Species List for Each Ecosite in the Area of the LSA in the Central Mixedwood and Lower Boreal Highland Subregions

Ecosite Phase a1	Scientific Name Arctostaphylos uva-ursi	Common Name Bearberry	<u>Life Form</u> Shrub	Rare (Yes/No
a1	Campanula rotundifolia	Bluebell	Forb	N N
	•		Grass	N N
a1	Carex siccata	Dry spike sedge		
a1	Cladina mitis	Yellow reindeer lichen	Lichen	N
a1	Cladina rangiferina	Reindeer lichen	Lichen	N
a1	Cladina stellaris	Cauliflower heads	Lichen	N
a1	Cornus canadensis	Bunchberry	Forb	N
a1	Dryopteris assimilis	Broad spinulose shield fern	Grass	N
a1	Elymus innovatus	Hairy wild rye	Grass	N
a1	Epilobium angustifolium	Fireweed	Forb	N
		Common horsetail	Forb	l N
a1	Equisetum arvense			
a1	Equisetum sylvaticum	Woodland horsetail	Forb	N
a1	Galium boreale	Northern bedstraw	Forb	N
a1	Ledum groenlandicum	Labrador tea	Shrub	N
a1	Linnaea borealis	Twin-flower	Shrub	N
a1	Lycopodium annotinum	Stiff club-moss	Forb	N
a1	Maianthemum canadense	Wild lily-of-the-valley	Forb	N
a1	Oryzopsis pungens	Northern ricegrass	Grass	N
a1	Peltigera aphthosa	Freckle pelt	Lichen	N N
a1	Picea mariana	Black spruce	Shrub	N
a1	Pinus banksiana	Jack pine	Shrub	N
a1	Pleurozium schreberi	Big red stem	Moss	N
a1	Potentilla tridentata	Three-toothed cinquefoil	Forb	N
a1	Rosa acicularis	Prickly rose	Shrub	N
a1	Salix bebbiana	Beaked willow	Shrub	N
a1	Smilacina trifolia	Three-leaved Solomon's-seal	Forb	N N
a1	Solidago spathulata	Spike-like goldenrod	Forb	N N
	0 ,			
a1	Vaccinium myrtilloides	Blueberry	Shrub	N
a1	Vaccinium vitis-idaea	Bog cranberry	Shrub	N
a1	Viburnum edule	Low-bush cranberry	Shrub	N
b1	Achillea millifolium	Yarrow	Forb	N
b1	Actaea rubra	Baneberry	Forb	N
b1	Arctostaphylos uva-ursi	Bearberry	Shrub	N
b1	Aster ciliolatus	Lindley's aster	Forb	N N
b1	Astragalus americanus	American milk-vetch	Forb	N
b1		Tufted moss	Moss	l N
	Aulacomnium palustre			
b1	Calypso bulbosa	Venus' slipper	Forb	N
b1	Cornus canadensis	Bunchberry	Forb	N
b1	Elymus innovatus	Hairy wild rye	Grass	N
b1	Epilobium angustifolium	Fireweed	Forb	N
b1	Equisetum arvense	Common horsetail	Forb	N
b1	Equisetum sylvaticum	Woodland horsetail	Forb	N
b1	Fragaria virginiana	Wild strawberry	Forb	N
b1	Galium boreale	Northern bedstraw	Forb	N N
b1	Geocaulon lividum	Northern bastard toadflax	Forb	N
b1	Goodyera repens	Rattlesnake plantain	Forb	N
b1	Habenaria orbiculata	Round-leaved orchid	Forb	N
b1	Hieracium umbellatum	Narrow-leaved hawkweed	Forb	N
b1	Hylocomium splendens	Stair-step moss	Moss	N
b1	Lathyrus ochroleucus	Creamy peavine	Forb	N
b1	Ledum groenlandicum	Labrador tea	Shrub	N
b1	Linnaea borealis	Twin-flower	Forb	N
b1	Listera cordata	Heart-leaved twayblade	Forb	N
b1	Lonicera caerulea	Fly honeysuckle	Shrub	N
b1	Lonicera dioica	Twining honeysuckle	Shrub	N
b1	Lonicera involucrata	Bracted honeysuckle	Shrub	N
b1	Lycopodium annotinum	Stiff club-moss	Forb	N
b1	Lycopodium clavatum	Common club-moss	Forb	N N
b1	Lycopodium complanatum	Ground cedar	Forb	N N
b1	Lycopodium dendroideum		Forb	N N
		Round-branched ground-pine		
b1	Maianthemum canadense	Wild lily-of-the-valley	Forb	N
b1	Mertensia paniculata	Tall mertensia	Forb	N
b1	Mitella nuda	Bishop's-cap, Mitrewort	Forb	N
b1	Orthelia secunda	One-sided wintergreen	Forb	N
b1	Pedicularis labradorica	Labrador lousewort	Forb	N
b1	Petasites palmatus	Palmate-leaved coltsfoot	Forb	N
b1	Picea glauca	White spruce	Shrub	N
b1	Picea mariana	Black spruce	Shrub	N N
b1	Pinus banksiana	Jack spruce	Shrub	N N
		· ·		
b1	Pleurozium schreberi	Big red stem	Moss	N
b1	Polytrichum spp.		Moss	N
b1	Populus balsamifera	Balsam poplar	Tree	N
b1	Populus tremuloides	Trembling aspen	Shrub	N
b1	Potentilla tridentata	Three-toothed cinquefoil	Forb	N
b1	Ptilium crista-castrensis	Knight's plume	Moss	N N
				N N
b1	Pyrola asarifolia	Pink wintergreen	Forb	
b1	Rosa acicularis	Prickly Rose	Shrub	N
b1	Rubus pubescens	Dewberry, Running raspberry	Forb	N
b1	Salix bebbiana	Beaked willow	Shrub	N
b1	Salix pyrifolia	Balsam willow	Shrub	N N
b1	Salix scouleriana	Scouler's willow	Shrub	N
b1	Shepherdia canadensis	Canadian Buffalo-berry	Shrub	N
b1	Solidago spp.		Forb	N
b1	Trientalis borealis	Star Flower	Forb	N
b1	Vaccinium myrtilloides	Blueberry	Shrub	N
	Vaccinium vitis-idaea	Bog cranberry	Shrub	N
	ง สบบแทนไป	bog danberry		
b1	1.05	Landenal Control		
b1 b1	Viburnum edule	Low-bush cranberry	Shrub	N

Appendix E Species List for Each Ecosite in the Area of the LSA in the Central Mixedwood and Lower Boreal Highland Subregions

Ecosite Phase b1	Scientific Name Viola renifolia	<u>Common Name</u> Kidney-leaved violet	<u>Life Form</u> Forb	Rare (Yes/No) N
b3	Alnus crispa	Green alder	Shrub	N N
b3	Arctostaphylos uva-ursi	Bearberry	Shrub	N
b3	Cladina mitis	Yellow reindeer lichen	Lichen	N
b3	Cladina rangiferina	Reindeer lichen	Lichen	N
b3	Cornus canadensis	Bunchberry	Shrub	N
b3	Elymus innovatus	Hairy wild rye	Grass	N
b3	Ledum groenlandicum	Labrador tea	Shrub	N
b3	Picea glauca	White spruce	Shrub	N
b3	Pinus banksiana	Jack pine	Trees	N
b3	Pleurozium schreberi	Big red stem	Moss	N
b3	Potentilla tridentata	Three-toothed cinquefoil	Forb	N N
		Common wild rose		
b3	Rosa woodsii		Shrub	N
b3	Shepherdia canadensis	Canadian Buffalo-berry	Shrub	N
b3	Usnea spp.		Lichen	N
b3	Vaccinium myrtilloides	Blueberry	Shrub	N
b3	Vaccinium vitis-idaea	Bog cranberry	Shrub	N
c1	Achillea millifolium	Yarrow	Forb	N
c1	Alnus crispa	Green alder	Shrub	N
c1	Antennaria neglecta	Broad-leaved everlasting	Forb	N N
c1	Arctostaphylos uva-ursi	Bearberry	Shrub	N
c1	Aster ciliolatus	Lindley's aster	Forb	N
c1	Aulacomnium palustre	Tufted moss	Moss	N
c1	Betula glandulosa	Bog birch	Shrub	N
c1	Betula neoalaskana	Alaska birch	Shrub	N
c1	Betula occidentalis	Black birch	Shrub	N
c1	Betula pumila	Dwarf birch	Shrub	N N
c1	-	Dwall blich	Lichen	N N
	Bryoria spp.	Divisions March and and		
c1	Calamagrostis canadensis	Bluejoint, Marsh reed grass	Grass	N
c1	Calliergon giganteum	Giant water moss	Moss	N
c1	Caltha palustris	Marsh marigold	Forb	N
c1	Campanula rotundifolia	Bluebell	Forb	N
c1	Carex brunnescens	Brownish sedge	Grass	N
c1	Carex chordorrhiza	Creeping sedge	Grass	N
c1	Carex disperma	Two seeded sedge	Grass	N
c1	Carex spp.	1 Wo secuca scage	Grass	N N
		Charthadaadaa		N N
c1	Carex vaginata	Sheathed sedge	Grass	
c1	Ceratophyllum demersum	Hornwort	Moss	N
c1	Cetraria spp.		Lichen	N
c1	Cladina mitis	Yellow reindeer lichen	Forb	N
c1	Cladina rangiferina	Reindeer lichen	Lichen	N
c1	Cladina spp.		Lichen	N
c1	Cladina stellaris	Cauliflower heads	Lichen	N
c1	Cladonia spp.	Caamiewer ricade	Lichen	N N
		Deialda aladania		
c1	Cladonia uncialis	Prickle cladonia	Lichen	N
c1	Climacium dendroides	Common tree moss	Moss	N
c1	Coptis trifolia	Goldthread	Forb	N
c1	Cornus canadensis	Bunchberry	Forb	N
c1	Delphinium glaucum	Tall larkspur	Forb	N
c1	Dicranum polysetum	Electric eels	Moss	N
c1	Dicranum spp.		Moss	N
c1	Dicranum undulatum	Wavy dicranum	Moss	N
				Y
c1	Diphasiastrum sitchense	Ground-fir	Forb	
c1	Elymus innovatus	Hairy wild rye	Grass	N
c1	Epilobium angustifolium	Fireweed	Forb	N
c1	Equisetum arvense	Common horsetail	Forb	N
c1	Equisetum pratense	Meadow horsetail	Forb	N
c1	Equisetum scirpoides	Dwarf scouring rush	Forb	N
c1	Equisetum sylvaticum	Woodland horsetail	Forb	N
c1	Euphrasia hudsoniana	Hudson Bay eyebright	Forb	Ϋ́
c1	Galium boreale	Northern bedstraw	Forb	N N
c1	Geocaulon lividum	Northern bastard toadflax	Forb	N
c1	Hylocomium splendens	Stair-step moss	Moss	N
c1	Jamesoniella autumnalis	Jameson's liverwort	Moss	N
c1	Larix laricina	Tamarack	Shrub	N
c1	Lathyrus ochroleucus	Creamy peavine	Forb	N
c1	Ledum groenlandicum	Labrador tea	Shrub	N
c1	Linnaea borealis	Twin-flower	Shrub	N
c1	Lonicera caerulea	Fly honeysuckle	Shrub	N N
c1	Lonicera caerulea var. villosa	Fly honeysuckle	Shrub	N
c1	Lycopodium annotinum	Stiff club-moss	Forb	N
c1	Lycopodium clavatum	Common club-moss	Forb	N
c1	Lycopodium complanatum	Ground cedar	Forb	N
c1	Lycopodium obscurum	Ground pine	Forb	N
c1	Maianthemum canadense	Wild lily-of-the-valley	Forb	N
c1	Melampyrum lineare	Cow-wheat	Forb	N N
c1	Mertensia paniculata	Tall mertensia	Forb	N
c1	Mitella nuda	Bishop's-cap, Mitrewort	Forb	N
c1	Orthelia secunda	One-sided wintergreen	Forb	N
c1	Oryzopsis pungens	Northern ricegrass	Grass	N
c1	Pedicularis labradorica	Labrador lousewort	Forb	N
c1	Peltigera aphthosa	Freckle pelt	Lichen	N
c1	Peltigera canina	dog lichen	Lichen	N
	Peltigera spp.	1	Lichen	N
c1		Palmate-leaved coltsfoot	Forb	N
c1 c1	Petasites paimatus			
c1	Petasites palmatus Picea glauca			
	Petasites paimatus Picea glauca Picea mariana	White spruce Black spruce	Shrub Shrub	N N