MAR 20160012: BRAZEAU RANGE

A report on Dolomitic Siltstone and Limestone on the Brazeau Range property near Nordegg.

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GRAYMONT WESTERN CANADA INC.

2016 EXPLORATION AND FIELDWORK WITHIN THE BRAZEAU RANGE METALLIC AND INDUSTRIAL MINERALS PERMIT, WEST-CENTRAL ALBERTA

PART B

Metallic and Industrial Minerals Permit
9302090596

Geographic Coordinates

52° 20' N to 52° 30' N
115° 44' W to 116° 01' W

NTS Sheets 83 B/5, C/8

Owner and Operator:	Graymont Western Canada Inc. 260, 4311 - 12 Street NE Calgary, Alberta T2E 4P9
Consultant:	Dahrouge Geological Consulting Ltd. 18, 10509 - 81 Avenue Edmonton, Alberta T6E 1X7
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Date Submitted:	September 1, 2016

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PART C

1. SUMMARY

During July 2016, the southern parts of Brazeau Range, south of Nordegg and within Metallic and Industrial Minerals (MAIM) Permit 9302090596, were explored for high-quality carbonate rocks. Exploration conducted in 2016 was a follow-up to previous exploration conducted along Brazeau Range during the summers of 2002-2004, 2006-2010, 2012 and 2014.

A total of 36 locations were mapped in detail within the Brazeau Range Permit. In total, 79 rock samples were collected, representing approximately 243 m of stratigraphy. Samples were sent to a laboratory for whole-rock analysis.

Throughout this report attitudes of bedding and other planar features are given as A°/B° SW, where A° is the azimuth of the strike and B° is the amount of dip in the direction indicated (right-hand rule). A magnetic declination of 16°17' east was used. Where bedding was not evident, stratigraphic thicknesses were calculated using orientations from adjacent units. Where more than one bedding orientation was measured, the mean orientation is used.

2. INTRODUCTION

The 2016 exploration within the Brazeau Range Permit was conducted by Dahrouge Geological Consulting Ltd. (Dahrouge), on behalf of Graymont Western Canada Inc. (Graymont). This assessment report describes the exploration conducted within MAIM Permit 9302090596, which encompasses southern parts of Brazeau Range of the Alberta Foothills. The 2016 exploration was authorized by Darren Anderson of Graymont Western Canada Inc.

The objectives of the 2016 exploration were to expand on the previously explored areas, and to locate and better define carbonate units throughout the Property. This report includes information on the geology and quality of carbonates encountered while mapping and sampling outcrops within the permit area.

3. GEOGRAPHIC SETTING AND ACCESS

3.1 LOCATION AND ACCESS

MAIM Permit 9302090596 encompasses the southern part of Brazeau Range south of North Saskatchewan River and parts of the northeast side of Brazeau Range north of North Saskatchewan River, near Nordegg, Alberta (Fig. 3.2).

The southern portion of MAIM Permit 9302090596 is accessible via Highway 752, which branches southwest from Rocky Mountain House and North Fork Road 3 km west of Strachan, or

23 km east on a secondary road branching from Forestry Trunk Road about 28 km south of Highway 11. Access to and throughout the Property is by all-terrain vehicle or helicopter, and extensive hiking.

Several creeks, mountains, and other features presently without names on published maps have been assigned informal names in this report to facilitate references to geographic locations.

3.2 INFRASTRUCTURE

Accommodations, food, fuel and other necessary services are available in Rocky Mountain House or Nordegg. The local economy is primarily based on agriculture, forestry, and energy-based industries.

Rocky Mountain House, with a population of about 7,000, is accessed by traveling 67 km west of Red Deer along the David Thompson Highway (Highway 11), and then 12 km north along Highway 22.

The Hamlet of Nordegg is about 85 km west of Rocky Mountain House, along Highway 11 (Fig. 3.2). Nordegg has a population of about 100.

3.3 TOPOGRAPHY, VEGETATION AND CLIMATE

The Brazeau Range Permit is included in the Eastern-Slope Montane Forest Ecological Region, and lies within the Rocky-Clearwater District of the Alberta Forest Reserve. In the subalpine zone, vegetation consists of stunted subalpine fir and Englemann Spruce, and alpine foliage above the treeline. Vegetation in areas of rugged limestone outcroppings is generally sparse, and commonly consists of junipers, other low brush, and grasses. Below the treeline, vegetation consists of dense stands of Aspen, Lodgepole Pine, White Spruce, and less frequent stands of Douglas Fir.

The Property is comprised of northwest-trending ridges cut by northeast-trending valleys and drainages. Elevations range from approximately 1,160 m at 'The Gap' along North Saskatchewan River to about 2,130 m atop Spider Mountain. The Property is cut by a number of drainages, including Dizzy Creek, Lundine Creek, Storm Creek, Trout Creek, and most notably, North Saskatchewan River, which cuts through the middle of the Property.

Climate is sub-alpine with average summer temperatures of 20° to 25°C and winter temperatures of -15° to -20°C, with extremes of 35°C and -40°C. Rainfall averages about 40 cm per year; snowfall averages about 180 cm with the majority falling in December and January.

3.4 FIELD OPERATIONS

Field operations were conducted by a four-person geological crew from Dahrouge Geological Consulting Ltd., based in a hotel in Rocky Mountain House.

Transportation to and from the Property was by helicopter, based out of the Rocky Mountain House Airport.

Garmin GPSmap 62S instruments were used to mark outcrop locations and record access information. Compasses were set at a magnetic declination of 16°17' east.

4. PROPERTY, EXPLORATION AND EXPENDITURES

4.1 PROPERTY SUMMARY

Graymont Western Canada Inc. acquired MAIM Permit 9302090596 (Brazeau Range) in 2002 to cover Paleozoic limestones along the eastern flank of Brazeau Range north of North Saskatchewan River and the southern part of Brazeau Range, south of North Saskatchewan River (Fig. 1.2). The Brazeau Range Permit encompasses 5,056 hectares and is contiguous to the Nordegg South MAIM Lease (9410010456).

Based on the 2016 exploration, portions of the Brazeau Range Permit will be retained and converted to lease (Section 4.3, Fig. 4.1).

4.2 2016 EXPLORATION SUMMARY

From July 4 to 12, 2016, Dahrouge Geological Consulting Ltd., on behalf of Graymont Western Canada Inc., conducted exploration for carbonate lithotypes within west-central Alberta. The work was undertaken to determine the location, quality and extent of carbonate units in the permit area.

A total of 36 mapping stations were examined and 79 rock samples were collected (Fig.'s 4.2 & 4.3). Geological observations were recorded, including lithologic information, measurements of structural elements, and other pertinent details (Appendices 2 & 3). A solution of 10% HCl was used to assess carbonate quality in the field, and rock samples were shipped to Central Lab of Graymont Western U.S. Inc. in Utah for analyses (Appendix 4). In some instances, interval thicknesses were determined by measuring outcrops perpendicular to bedding, where it could be identified. Field maps were completed on 1:10,000 and 1:25,000 scale map sheets and concentrated on areas along Brazeau Range south of North Saskatchewan River.

4.3 EXPLORATION EXPENDITURES

Expenditures for 2016 totaled $77,565.74 (Appendix 1). Portions of the Brazeau Range Permit (MAIM Permit 9302090596) will be retained and converted to lease. The current permit area includes:

Land Description (Mer-Rg-Twp)	Current Size (ha)
5-13-39: 9L14, L15; 10NE, L11, L13, L14; 11L13-L16; 12L13, L14; 13W; 14-16; 17NE, L7, L8, L14; 19NE, L7, L8, L11, L13, L14; 20-22; 23S, NW, L9, L10, L15; 27SW; 28S, L10-L13; 29; 30; 31S; 32L1-L5; and	
5-14-39: 24L15, L16; 25N, SE, L6; 36NW, L1-L3, L8; and	
5-14-40: 1L4, L5, L12; 2L9, L16; 11L1, L2, L5-L7, L11-L13; 15NW, L1, L2, L6, L7; 16L16; 20L16; 21NW, SE, L3, L5, L6, L10; 22L4; 28L3-L5; 29; 30N, L1, L4-L8; 31SE, L3, L4, L9, L10; 32SW, L2.	5,056

Expenditures are allocated to MAIM Permit 9302090596 as follows:

Assessment Period MAIM Permit 9302090596	Expiry Date	Required Expenditures	Assigned Expenditures
Years 13 and 14	Sept. 04, 2016	$71,068.76*	$77,565.74

* Calculated from $75,840- $4,771.24 excess expenditures from previous term

5. REGIONAL GEOLOGY

In west-central Alberta, Paleozoic limestones are known to occur within the Middle Cambrian Eldon Formation, the Upper Devonian Mount Hawk Formation, the Upper Devonian Palliser Formation, the Upper Devonian to Lower Carboniferous Banff Assemblage and the Lower Carboniferous Rundle Assemblage (Table 5.1, Fig. 4.2).

Descriptions of the stratigraphy of the Mount Hawk, Palliser Formation, Banff Assemblage and Rundle Assemblage, are from a prior assessment report by Pana and Dahrouge (1998). A detailed review of the regional stratigraphy is provided by Stott and Aitken (1993), Mossop and Shetsen (1994), Halbertsma (1994), and Richards et al. (1994).

5.1 STRATIGRAPHY

5.1.1 Mount Hawk Formation

Along the Front Ranges of the Rocky Mountains, the Upper Devonian Fairholme Group was transgressivelly deposited on eroded Upper Cambrian strata, and consists of two carbonate reef formations, the Cairn and the overlying Southesk formations (Table 5.1). Both are replaced basinward by the laterally equivalent argillaceous beds of the Flume, Maligne, Perdrix, and Mount Hawk formations (Mountjoy et al., 1992).

The Upper Devonian Southesk Formation at its type section on Mount Dalhousie, near the confluence of Southesk and Brazeau rivers, is 161 m thick and divided into the Peechee, Grotto, and Arcs members (MacKenzie, 1966; Mountjoy et al., 1992). To the west it thins into argillaceous dolomites and dolomitic shales of the Mount Hawk Formation. Where Highway 11 crosses Brazeau Range, the upper part of the Mount Hawk Formation, consists of cryptocrystalline, black, medium-bedded, argillaceous limestone (Douglas, 1956).

5.1.2 Palliser Formation

In west-central Alberta, the Upper Devonian Palliser Formation consists mainly of outer shelf and basinal carbonates of the Sassenach Basin (Halbertsma, 1994). The Palliser Formation is divisible into the Morro and overlying Costigan members, which are separated by an unconformity. The Morro Member comprises a lithologic suite dominated by carbonates with significant lateral facies variations. The Costigan Member consists of open-marine fossiliferous limestones and shales, with local evaporitic sedimentation. Within Foothills and Front Ranges of Alberta, limestones of the Palliser Formation vary from less than 180 m to more than 270 m in thickness (Holter, 1976).

The Palliser Formation is overlain by shales of the Exshaw Formation, and siliciclastics and carbonates of the Banff Assemblage.

5.1.3 Banff Assemblage

In west-central Alberta, the Exshaw, Banff and Yohin formations comprise the Banff Assemblage (Richards et al. 1994). The Upper Famennian to Lowermost Tournaisian Exshaw Formation is dominated by fine-grained siliciclastics deposited in euxinic basin to shallow-neritic environment. In general, it is unconformably overlain by the Lower to Upper Tournaisian Banff Formation, which is a heterogeneous association of carbonates and fine-grained siliciclastics deposited on poorly differentiated carbonate platforms. Westward, the uppermost Banff Formation grades laterally into the Rundle Assemblage.

5.1.4 Rundle Assemblage

The Lower Carboniferous Rundle Assemblage extends from MacKenzie Mountains in the Arctic south through the Peace River Embayment to southeastern British Columbia. In west-central Alberta, it comprises shallow-marine platform and ramp carbonates which prograded westward over deeper water shales and carbonates of the Banff Assemblage. The lower Rundle Assemblage is subdivided into the transgressive carbonate Pekisko Formation, and two regressive successions of restricted-marine carbonates and subordinate anhydrite assigned to the Shunda and Turner Valley formations (Richards et al. 1994). In southern Alberta the Pekisko grades laterally into the uppermost Banff Formation. The Turner Valley Formation extends from east-central British Columbia to southwest Alberta. According to Richards et al. (1994), the Turner Valley Formation thickens to the southwest and for most of its length is 50 m to 120 m thick. The type section near Turner Valley is 152 m thick and divisible into four beds.

Earlier work by Douglas (1958), and MacQueen and Bamber (1968) indicate that the eastern peritidal sequences of the uppermost Pekisko, Shunda and lower Turner Valley grade south and southwestward into the more open-marine sequence of the Livingstone Formation (Table 5.1).

The upper Rundle Assemblage includes the transgressive Mount Head Formation.

5.2 STRUCTURE

In Front Ranges and Foothills of west-central Alberta, Paleozoic and Mesozoic strata have been repeated along several major thrust faults. Displacements along these faults are interpreted to be tens of kilometres. Within individual thrust sheets, regional-scale folds exhibit a spatial relation to their leading edges. Near Nordegg, the main structural discontinuity is the northwest to southeast trending Brazeau Thrust. The leading edge of the thrust sheet is folded into the asymmetrical to recumbent Brazeau Anticline.

TABLE 5.1 GENERALIZED PALEOZOIC STRATIGRAPHY OF FOOTHILLS AND FRONT RANGES, WEST-CENTRAL ALBERTA*

System or Subsystem	Stratigraphic Unit: Assemblage / Group	Stratigraphic Unit: Formation (S)	Formation (N)
Lower Carboniferous	Rundle Assemblage	Mount Head	
		[1] Livingstone	Turner Valley
			Shunda
			Pekisko
	~~		
	Banff Assemblage	Banff	
		~~	
		Exshaw	
Upper Devonian		[1] Palliser	
		Alexo	
	~~		
	Fairholme Group°	Southesk	Mount Hawk
		Cairn	
~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
Cambrian		Pika	
		Eldon	
		Stephen	
		Cathedral	

*Compiled from MacKenzie (1969), Richards et al. (1994), Switzer et al. (1994), and Holter (1994).
° Fairholme Group of MacKenzie (1969) is partly equivalent to the Woodbend Group (Switzer et al., 1994).
[1] Current limestone production (*from* Holter, 1994)

6. RESULTS

Nine days were spent mapping and sampling carbonate outcrops in detail. The 2016 exploration concentrated on defining stratigraphic unit locations and contacts within previously under-explored areas of the Property.

Carbonate lithologies of the Palliser, Banff, Pekisko and Turner Valley formations were examined and sampled within Brazeau Range, north of North Saskatchewan River (Fig. 4.2). A total of 79 intervals were sampled, representing approximately 243 m of stratigraphy (Appendix 2). Where bedding could not be identified, stratigraphic measurements were based on the previously determined regional trend or deduced from surrounding measurements where possible.

Six outcrops of the Palliser Formation were examined in 2016, to test the potential for high-calcium limestone in the upper part of the unit and high-quality dolomite in the lower part of the unit (Fig. 4.2). Section 2016-10, located approximately 1 km northwest of Sheeptrap Mountain, tested the upper part of the formation (the Costigan Member) and averaged 94.14% $CaCO_3$, 3.48% $MgCO_3$ and 1.57% SiO_2 over 7 m. The upper part of the formation consists of weakly dolomitic, medium- to dark-brownish-grey lime mudstone to wackestone. The lower part of the formation (Morrow Member), which was not sampled in 2016, generally consists of medium- to dark-grey, variably dolomitic mudstones. The Palliser Formation continues to display highly variable composition and further work is required before a conclusion can be made regarding its potential for high-calcium limestone or high-quality dolomite.

Significant intervals of the Banff Formation were mapped in 2016. Eight outcrops of the Banff Formation were sampled, to test the potential for high-calcium limestone (Fig. 4.2). Section 2016-06, located approximately 1 km southeast of Sheeptrap Mountain, averaged 93.51% $CaCO_3$, 3.90% $MgCO_3$ and 1.89% SiO_2 over 10 m. The Banff Formation consists of tan weathered, medium-brownish-grey fresh, micritic to fine-grained (with minor coarse-grained bioclasts) lime mudstone to wackestone. The Banff Formation is not considered a unit of interest due to its low $CaCO_3$ values and high SiO_2 content.

The majority of the outcrops visited in 2016 were within the Pekisko Formation. Analytical results were variable, presumably due to the fact that different members within the formation were sampled. The best sample section was 2016-14, which averaged 98.58% $CaCO_3$, 0.99% $MgCO_3$ and 0.23% SiO_2 over approximately 37.5 m, and was collected from a resistant limestone cliff located west of Sheeptrap Mountain (Fig. 4.2). Several other sample sections and isolated intervals returned values in excess of 95% $CaCO_3$ over several metres, however $MgCO_3$, and less commonly SiO_2, impurities were common in many of these sections. The high-quality Pekisko intervals generally consist of resistant and massive, light- to medium-brownish-grey, fine- to coarse-grained crinoidal lime wackestone to grainstone. Lower quality intervals generally consist of less resistant, medium- to dark-brownish-grey, micritic to fine-grained lime mudstone to packstone. Overall, the Pekisko Formation has the greatest high-calcium limestone potential in the area.

Several outcrops of Turner Valley Formation were mapped in 2016 during traverses, and one sample was collected. Sample 121338, which was 1.25 m thick, returned values of 86.51% $CaCO_3$, 12.32% $MgCO_3$ and 0.83% SiO_2. Outcrops generally consisted of vuggy, medium-brown to medium-grey, moderately to strongly dolomitic mudstone to wackestone. The Turner Valley Formation has the greatest potential for high-quality dolomite in the permit area, although more work is required to constrain the extent and overall quality.

7. CONCLUSIONS

Carbonate units of the Palliser, Banff, Pekisko and Turner Valley formations were examined and sampled along Brazeau Range north of North Saskatchewan River. A total of 79 discrete intervals were sampled and described in detail. Additionally, 36 mapping stations were completed to define stratigraphic contacts and structures. Based on the samples collected and units mapped during the 2016 exploration and overall Property assessment, portions of the permit will be retained and converted to lease.

Access roads and trails were noted, which provide limited access to the exterior of the Property. Extensive hiking and/or helicopter support are required to reach much of the Property.

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9. STATEMENT OF QUALIFICATIONS

I, Patrick Kluczny, residing at [redacted] do hereby certify that:

- I am a geologist of Dahrouge Geological Consulting Ltd., Suite 18, 10509 - 81 Ave., Edmonton, Alberta, T6E 1X7.
- I am a 2006 graduate of the University of Alberta, Edmonton, Alberta with a B.Sc. in Geology.
- I have practiced my profession as a geologist continuously since 2006.
- I am a registered Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta, member M81985.
- I hereby consent to the copying or reproduction of this Assessment Report following the one-year confidentiality period.
- I am the co-author of the report entitled "2016 Exploration and Fieldwork within the Brazeau Range Metallic and Industrial Minerals Permit, West-Central Alberta" and accept responsibility for the veracity of technical data and results.

Dated this 1st day of September, 2016.

Patrick Kluczny, B.Sc., P.Geol.

APEGA M81985

ITEMIZED COST STATEMENT FOR THE 2016 EXPLORATION - BRAZEAU RANGE

a) Personnel

[redacted]							
4.68	days		office	Project supervision & preparations, GIS compilation			
4.68	days	@	$ 795.00		$	3,720.60	
[redacted]							
4.50	days		field	Geological mapping and rock sampling, July 4-8			
0.92	days		office	Field preparations, data entry, GIS compilation			
5.42	days	@	$ 680.00		$	3,685.60	
[redacted]							
0.33	days		office	Field preparations, data entry, GIS compilation			
0.33	days	@	$ 670.00		$	221.10	
[redacted]							
5.50	days		field	Geological mapping and rock sampling, July 8-13			
4.42	days		office	Field preparations, data entry, GIS compilation			
9.92	days	@	$ 520.00		$	5,158.40	
[redacted]							
10.00	days		field	Geological mapping and rock sampling, July 4-13			
10.00	days	@	$ 520.00		$	5,200.00	
[redacted]							
10.00	days		field	Geological mapping and rock sampling, July 4-13			
0.63	days		office	Field preparations, data entry, GIS compilation			
10.63	days	@	$ 350.00		$	3,720.50	
[redacted]							
10.00	days		field	Geological mapping and rock sampling, July 4-13			
1.00	days		office	Field preparations, data entry, GIS compilation			
11.00	days	@	$ 350.00		$	3,850.00	
[redacted]							
1.25	hours		office	Logistics, shipping			
1.25	hours	@	$ 42.00		$	52.50	
							$ 25,608.70

b) Food and Accommodation

36	man-days	@	$ 154.65	accommodations	$	5,567.43	
23	man-days	@	$ 60.50	meals	$	1,391.50	
							$ 6,958.93

c) Transportation

Ahlstrom Air Helicopter (flight hours + fuel, transportation, etc.)	$	33,620.80	
4x4 Truck Rental	$	1,285.71	
Fuel	$	178.31	
			$ 35,084.82

d) Instrument Rental

Radio (4)	$	102.86	
SPOT Locators (2)	$	64.29	
GPS (3)	$	64.29	
			$ 231.44

e) Drilling n/a

f) Analyses

			Central Lab of Graymont Western U.S. Inc.				
			(79 rock chip samples)				
79	samples	@	$ 4.50	preparation fee	$	355.50	
79	samples	@	$ 25.00	sample analysis	$	1,975.00	
							$ 2,330.50

g) Other

Misc. Supplies	$	116.84	
Prints/plots	$	52.50	
Sample shiipping	$	130.58	
			$ 299.92

Total	$ 70,514.31
Administration (10%)	$ 7,051.43
Total + Administration	**$ 77,565.74**

[redacted]

P. Kluczny, B.Sc., P.Geol.

Edmonton, Alberta
September 1, 2016

C

APPENDIX 2: 2016 SAMPLE DESCRIPTIONS AND ASSAY RESULTS FROM THE BRAZEAU RANGE PROPERTY

DAHROUGE GEOLOGICAL CONSULTING LTD.

GRAYMONT

Notes: Stratigraphic thicknesses are based on measured attitudes of bedding listed below, with appropriate interpolations. Attitudes are strike and dip (right-hand rule). Sections are listed in numerical order of samples, which does not necessarily represent stratigraphic order. Most samples consist of chips at 30 cm intervals. UTM coordinates are NAD83, Zone 11N. Section locations are shown in Figure 4.2. Stratigraphy Abbreviations: Dpa - Devonian Palliser Formation; Mbf - Mississippian Banff Formation; Mpk - Mississippian Pekisko Formation; Msh - Mississippian Shunda Formation; Mtv - Mississippian Turner Valley Formation

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
Isolated Samples											
121307 UTM 583291E, 5800459N	Mbf	3	**Calcareous Dolomitic Mudstone,** light grey to light brown weathered, light brown to tan fresh, very fine-grained, thinly-bedded to moderately-bedded, argillaceous, nodular, weak HCl reaction, structure(s): bedding (possible) 82/26 SE	42.25	25.02	26.31	1.927	0.638	121	239	579
121308 UTM 583296E, 5800450N	Mbf	2.5	**Calcareous Dolomitic Mudstone,** light grey weathered, light brown to light grey fresh, very fine-grained, recessive, argillaceous, moderate HCl reaction, structure(s): bedding (possible) 93/21 S	46.85	28.72	19.34	1.994	0.541	134	231	422
121317 UTM 581751E, 5802454N	Dpa	2	**Strongly Dolomitic Lime Mudstone,** light grey weathered, light grey to light brown fresh, very fine-grained to fine-grained, thinly-bedded, sucrosic, crumbly, weak HCl reaction	84.80	9.18	3.99	0.795	0.462	328	988	880
121318 UTM 581750E, 5802451N	Dpa	2.5	**Slightly Dolomitic Lime Mudstone,** light grey weathered, light grey to medium brown fresh, thinly-bedded to moderately-bedded, moderate, moderate HCl reaction	93.54	2.97	2.72	0.283	0.200	526	408	204
121319 UTM 580193E, 5801410N	Mpk	3	**Dolomitic Lime Mudstone,** very-light grey to light grey weathered, light brown-grey fresh, micritic, fossils: solitary rugose coral; crinoid ossicle, rare, thickly-bedded to massively-bedded, resistant, moderate HCl reaction, structure(s): calcite veinlet, local-scale, weak; bedding (possible) 116/25 W; bedding (possible) 104/21 SW	93.43	5.90	0.43	0.066	0.095	270	31	50
121322 UTM 580232E, 5801552N	Mpk	2.25	**Lime Mudstone to Lime Grainstone,** very-light grey to light grey weathered, medium brown-grey fresh, medium-grained to coarse-grained, fossils: fragment (indeterminate); crinoid ossicle, abundant; brachiopod, rare, moderately-bedded, resistant, strong HCl reaction, structure(s): calcite veinlet	98.88	0.71	0.20	0.052	0.086	219	39	50
121323 UTM 580241E, 5801612N	Mpk	3	**Lime Grainstone,** very-light grey to light grey weathered, medium grey fresh, medium-grained to coarse-grained, fossils: crinoid ossicle, abundant, moderately-bedded, resistant, weak fetid odour, strong HCl reaction, structure(s): bedding (possible) 119/29 SW	98.79	0.79	0.17	0.046	0.119	235	46	50
121324 UTM 579741E, 5801577N	Mpk	2	**Lime Packstone to Lime Grainstone,** light grey to medium grey weathered, light grey to tan fresh, coarse-grained, fossils: crinoid ossicle, moderately-bedded, resistant, strong HCl reaction, structure(s): fracture; bedding (possible) 127/41 SW	98.99	0.69	0.16	0.042	0.076	226	33	50
121325 UTM 579700E, 5801631N	Mpk	2	**Lime Grainstone,** light grey to medium grey weathered, light grey to tan fresh, coarse-grained, fossils: crinoid ossicle, moderately-bedded, resistant, crumbly, strong HCl reaction, structure(s): fracture	98.97	0.71	0.13	0.041	0.086	240	38	50
121326 UTM 584152E, 5802016N	Dpa	2	**Lime Mudstone,** light grey weathered, dark grey fresh, very fine-grained to fine-grained, fossils: fragment (indeterminate), rare, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 325/55 NE	93.86	2.57	2.68	0.365	0.220	481	623	448
121327 UTM 584339E, 5801973N	Mbf	2	**Lime Wackestone,** light tan-grey weathered, medium brown-grey fresh, medium-grained, fossils: fragment (indeterminate); crinoid ossicle, common, thinly-bedded, recessive, strong HCl reaction	83.31	1.97	14.00	0.467	0.290	1065	350	185

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
121328 UTM 584346E, 5801968N	Mbf	1.25	**Lime Wackestone to Lime Grainstone,** light tan-grey weathered, medium brown-grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate); crinoid ossicle, thinly-bedded, recessive, strong HCl reaction, structure(s): bedding (possible) 347/49 NE	88.45	1.49	9.46	0.214	0.165	960	483	292
121329 UTM 584358E, 5801969N	Mbf	1.75	**Lime Wackestone to Lime Grainstone,** light tan-grey weathered, medium brown-grey fresh, fine-grained to coarse-grained, fossils: fragment (indeterminate); crinoid ossicle; colonial coral, thinly-bedded, recessive, strong HCl reaction, structure(s): bedding (possible) 332/41 NE	89.28	1.78	8.64	0.148	0.122	907	91	50
121330 UTM 584382E, 5801942N	Mbf	4	**Argillaceous Lime Mudstone to Lime Wackestone,** light grey to white weathered, light brown-grey fresh, fine-grained, fossils: fragment (indeterminate), rare; crinoid ossicle, rare, thinly-bedded to moderately-bedded, recessive, strong HCl reaction, structure(s): bedding (possible) 308/64 NE	83.99	2.38	12.71	0.418	0.286	1297	520	217
121331 UTM 584596E, 5801969N	Mpk	grab	**Slightly Dolomitic Lime Packstone,** light grey weathered and fresh, medium-grained, fossils: gastropod, rare; fragment (indeterminate), common; crinoid ossicle, common, thickly-bedded to massively-bedded, nodular, strong HCl reaction	95.84	3.26	0.69	0.066	0.063	301	29	50
121332 UTM 584622E, 5801974N	Mpk	2	**Lime Wackestone,** light grey weathered, light brown-grey fresh, fine-grained, fossils: fragment (indeterminate); crinoid ossicle, moderately-bedded, nodular, strong HCl reaction, structure(s): bedding (possible) 310/51 NE	98.29	0.96	0.53	0.067	0.089	311	23	50
121333 UTM 584602E, 5802005N	Mpk	3	**Lime Wackestone to Lime Grainstone,** light grey to tan weathered, light brown-grey fresh, medium-grained to coarse-grained, fossils: fragment (indeterminate); crinoid ossicle, abundant, thickly-bedded, resistant, mottled, vuggy (open), strong HCl reaction, structure(s): bedding (possible) 310/38 NE	98.34	0.88	0.57	0.062	0.066	338	43	50
121334 UTM 584542E, 5802045N	Mpk	1.5	**Lime Wackestone,** light grey to tan weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate); crinoid ossicle, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 300/44 NE	98.49	0.88	0.46	0.054	0.049	318	23	50
121338 UTM 583294E, 5803470N	Mtv	1.25	**Strongly Dolomitic Lime Wackestone,** light tan-grey weathered, light brown-grey to black fresh, fine-grained, fossils: fragment (indeterminate); crinoid ossicle, moderately-bedded, resistant, hard, mottled, vuggy (calcite-filled), strong HCl reaction	86.51	12.32	0.83	0.140	0.092	321	47	50
121339 UTM 579494E, 5801803N	Mpk	2	**Lime Packstone to Lime Grainstone,** light grey weathered and fresh, medium-grained to coarse-grained, fossils: crinoid ossicle, moderately-bedded, strong fetid odour, strong HCl reaction, structure(s): bedding (possible) 145/42 SW	98.91	0.73	0.16	0.047	0.081	233	31	50
Section 2016-01 (UTM 578248E, 5802876N)											
121276	Mpk	3	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, abundant, resistant, strong HCl reaction	98.38	0.94	0.37	0.093	0.144	337	50	50
121277	Mpk	3	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, abundant, resistant, strong HCl reaction	98.95	0.73	0.09	0.046	0.109	308	43	50
Section 2016-02 (UTM 578303E, 5802808N)											
121278	Mpk	3	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, abundant, resistant, strong HCl reaction	98.90	0.75	0.13	0.047	0.099	295	38	50
121279	Mpk	3	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, abundant, strong HCl reaction	98.99	0.71	0.08	0.043	0.102	400	36	50
121280	Mpk	1.5	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, abundant, strong HCl reaction	98.84	0.79	0.15	0.050	0.079	381	35	50

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
121281	Mpk	2.5	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, rare, strong HCl reaction, structure(s): bedding (possible) 125/39 SW	99.02	0.67	0.11	0.046	0.091	324	33	50
121282	Mpk	1	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, rare; crinoid ossicle, abundant,	98.97	0.71	0.13	0.046	0.081	329	31	50
Section 2016-03 (UTM 578294E, 5802774N)											
121283	Mpk	2.25	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, abundant, strong HCl reaction	98.97	0.69	0.13	0.040	0.117	333	46	50
121284	Mpk	2	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, rare; crinoid ossicle, abundant, strong HCl reaction	98.93	0.67	0.16	0.055	0.093	358	40	50
121285	Mpk	1.75	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, abundant, strong HCl reaction	98.82	0.82	0.16	0.059	0.079	348	31	50
121286	Mpk	2.5	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, common; brachiopod, rare, strong HCl reaction	98.90	0.82	0.12	0.035	0.078	379	31	50
121287	Mpk	1	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, rare; crinoid ossicle, abundant, strong HCl reaction	98.79	0.88	0.13	0.040	0.115	386	37	50
121288	Mpk	2.5	**Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle,	96.31	2.80	0.67	0.058	0.090	351	38	50
121289	Mpk	3	**Lime Mudstone,** light grey weathered, light brown-grey fresh, very fine-grained, fossils: crinoid ossicle, resistant, strong HCl reaction, structure(s): contact (sharp); bedding (possible) 133/43 SW	96.59	2.32	0.88	0.050	0.094	331	36	50
Section 2016-04 (UTM 578406E, 5805239N)											
121290	Mpk	3.5	**Lime Wackestone to Lime Packstone,** light grey weathered, light brown-grey fresh, very fine-grained to fine-grained, fossils: crinoid ossicle, abundant, thickly-bedded, resistant, strong HCl reaction, structure(s): joint 6/65 E; bedding (definite) 155/18 SW; bedding (definite) 148/10 SW	98.84	0.79	0.18	0.049	0.076	327	32	50
121291	Mpk	3.25	**Lime Packstone,** light grey weathered, light brown-grey fresh, very fine-grained to fine-grained, fossils: crinoid ossicle, abundant, massive, resistant, strong HCl reaction, structure(s): bedding (possible) 207/18 NW	98.72	0.88	0.18	0.059	0.088	326	29	50
121292	Mpk	4	**Lime Packstone to Lime Grainstone,** light grey weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: crinoid ossicle, abundant, massive, resistant, strong HCl reaction	98.84	0.82	0.13	0.058	0.082	303	30	50
121293	Mpk	3.5	**Lime Grainstone,** light grey weathered, light brown-grey fresh, medium-grained, fossils: crinoid ossicle, abundant, massive, resistant, strong HCl reaction	98.93	0.79	0.10	0.047	0.065	271	25	50
121294	Mpk	3	**Lime Grainstone,** light grey weathered, light brown-grey fresh, medium-grained, fossils: crinoid ossicle, abundant, massive, resistant, strong HCl reaction	98.61	1.07	0.13	0.045	0.092	346	30	50
121295	Mpk	3.5	**Lime Grainstone,** light grey weathered, light brown-grey fresh, medium-grained, fossils: crinoid ossicle, abundant, massive, resistant, strong HCl reaction	98.63	1.03	0.14	0.039	0.096	338	36	50

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
121296	Mpk	0.5	**Lime Grainstone**, light grey weathered, light brown-grey fresh, medium-grained, fossils: crinoid ossicle, abundant, massive, resistant, strong HCl reaction, structure(s): bedding (possible) 180/18 W; bedding (possible) 171/23 SW	98.75	0.94	0.13	0.037	0.075	325	29	50
121297	Mpk	1.5	**Lime Grainstone**, light grey weathered, light brown-grey fresh, medium-grained, fossils: crinoid ossicle, abundant, massive, resistant, strong HCl reaction, structure(s): bedding (possible) 183/16 W	98.79	0.90	0.13	0.038	0.073	330	27	50
Section 2016-05 (UTM 578351E, 5805105N)											
121298	Mpk	2.5	**Lime Wackestone**, light grey weathered, dark brown-grey fresh, medium-grained, fossils: crinoid ossicle; brachiopod, rare, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 121/61 SW	97.97	1.09	0.63	0.088	0.125	292	39	50
121299	Mpk	3	**Lime Packstone**, light grey weathered, dark brown-grey fresh, medium-grained, fossils: crinoid ossicle, common; brachiopod, rare, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 120/64 SW	98.70	0.98	0.13	0.041	0.068	332	24	50
121300	Mpk	2.75	**Lime Packstone**, light grey weathered, dark brown-grey fresh, medium-grained, fossils: crinoid ossicle, common; brachiopod, rare, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 127/61 SW	98.59	0.98	0.15	0.050	0.154	339	38	50
Section 2016-06 (UTM 583275E, 5800516N)											
121301	Mbf	4.25	**Slightly Dolomitic Lime Grainstone**, light grey weathered, light brown to light grey fresh, very fine-grained to medium-grained, fossils: crinoid ossicle, thinly-bedded to moderately-bedded, argillaceous, strong HCl reaction, structure(s): bedding (possible) 84/16 S	94.02	3.33	1.93	0.253	0.206	633	164	266
121302	Mbf	4.75	**Dolomitic Lime Grainstone**, light grey weathered, light brown to light grey fresh, medium-grained, fossils: crinoid ossicle, thinly-bedded to moderately-bedded, strong HCl reaction, structure(s): bedding (possible) 101/24 SW	92.54	4.79	1.95	0.246	0.203	399	176	473
121303	Mbf	1	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, medium-grained, fossils: crinoid ossicle, thinly-bedded to moderately-bedded, strong HCl reaction, structure(s): bedding (possible) 121/19 SW	95.97	2.07	1.40	0.154	0.198	404	176	237
Section 2016-07 (UTM 583263E, 5800492N)											
121304	Mbf	9.75	**Dolomitic Lime Grainstone**, light grey weathered, light brown to light grey fresh, medium-grained, fossils: crinoid ossicle, thinly-bedded to moderately-bedded, nodular, strong HCl reaction, structure(s): bedding (possible) 97/32 SW	83.87	8.58	5.58	0.743	0.571	346	236	510
121305	Mbf	3.75	**Strongly Dolomitic Lime Mudstone**, light grey weathered, light brown to light grey fresh, very fine-grained to fine-grained, fossils: crinoid ossicle, argillaceous, moderate HCl reaction	75.28	14.64	7.17	1.249	0.602	319	162	135
121306	Mbf	8	**Strongly Dolomitic Lime Mudstone**, light grey weathered, light brown to light grey fresh, very fine-grained to fine-grained, fossils: crinoid ossicle, argillaceous, moderate HCl reaction	77.10	10.96	9.47	1.087	0.496	256	158	435
Section 2016-08 (UTM 583308E, 5800436N)											
121309	Mpk G	4.5	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, medium-grained, fossils: crinoid ossicle, abundant, massive, strong HCl reaction, structure(s): contact (sharp)	98.27	1.21	0.25	0.058	0.096	278	43	246
121310	Mpk G	7.75	**Strongly Dolomitic Lime Grainstone**, light grey weathered, light brown to light grey fresh, medium-grained, fossils: crinoid ossicle, abundant, massive, strong HCl reaction, structure(s): contact (sharp)	80.80	18.16	0.74	0.088	0.118	205	54	50

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
Section 2016-09 (UTM 581781E, 5802486N)											
121311	Dpa	2	**Strongly Dolomitic Lime Mudstone**, tan to light grey weathered, light brown to tan fresh, very fine-grained to fine-grained, thinly-bedded to moderately-bedded, resistant, hard, sucrosic, weak HCl reaction, structure(s): bedding (possible) 13/10 SE	81.60	14.02	3.15	0.557	0.312	307	151	50
121312	Dpa	3.25	**Lime Mudstone**, light grey weathered, light brown to light grey fresh, very fine-grained, massive, strong HCl reaction	97.11	1.36	0.94	0.195	0.184	309	123	228
Section 2016-10 (UTM 581771E, 5802469N)											
121313	Dpa	3.25	**Lime Mudstone**, light grey weathered, light brown to light grey fresh, very fine-grained, thinly-bedded to massively-bedded, moderate HCl reaction, structure(s): bedding (possible) 126/9 SW; 122/18 SW	95.77	2.28	1.31	0.242	0.214	341	120	50
121314	Dpa	3.75	**Lime Mudstone**, light grey weathered, light brown to light grey fresh, very fine-grained, thinly-bedded to moderately-bedded, moderate HCl reaction	92.72	4.52	1.80	0.396	0.316	326	183	50
Section 2016-11 (UTM 581758E, 5802460N)											
121315	Dpa	4.5	**Strongly Dolomitic Lime Mudstone**, light grey weathered, light grey to medium brown fresh, very fine-grained, massive, strong HCl reaction, structure(s): bedding (possible) 125/13 SW	75.51	11.61	8.72	1.964	0.665	393	553	646
121316	Dpa	1.75	**Calcareous Dolomitic Mudstone**, light grey to tan weathered, light grey to light brown fresh, very fine-grained, fossils: crinoid ossicle; brachiopod, thinly-bedded to moderately-bedded, moderate HCl reaction	62.31	22.36	9.90	2.150	0.881	227	761	619
Section 2016-12 (UTM 580212E, 5801519N)											
121320	Mpk	5.75	**Lime Packstone to Lime Grainstone**, very-dark grey weathered, medium grey fresh, medium-grained to coarse-grained, fossils: fragment (indeterminate); crinoid ossicle, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 102/29 S	98.84	0.79	0.17	0.049	0.073	231	33	50
121321	Mpk	7.5	**Lime Packstone to Lime Grainstone**, very-dark grey to light grey weathered, medium grey fresh, medium-grained to coarse-grained, fossils: solitary rugose coral, rare; fragment (indeterminate); crinoid ossicle, abundant, moderately-bedded to massively-bedded, resistant, strong HCl reaction, structure(s): fracture moderate; bedding (possible) 102/29 S	98.79	0.77	0.23	0.050	0.070	223	30	50
Section 2016-13 (UTM 583469E, 5803347N)											
121335	Mpk	2.5	**Lime Wackestone to Lime Packstone**, light grey to tan weathered, light brown-grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), common; crinoid ossicle, common, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 126/12 SW	97.79	1.59	0.36	0.065	0.102	320	24	50
121336	Mpk	1.5	**Lime Mudstone to Lime Wackestone**, light grey weathered and fresh, fine-grained, fossils: fragment (indeterminate), rare; crinoid ossicle, rare, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 122/16 SW	98.54	0.94	0.30	0.065	0.079	314	21	50
121337	Mpk	2	**Lime Mudstone to Lime Wackestone**, light grey weathered and fresh, fine-grained, fossils: fragment (indeterminate), rare; crinoid ossicle, rare, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 122/16 SW	97.49	1.21	1.09	0.070	0.080	329	34	50

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
Section 2016-14 (UTM 580968E, 5800841N)											
121343	Mpk	3	**Lime Grainstone**, light grey weathered, medium grey fresh, medium-grained to coarse-grained, fossils: crinoid ossicle, massive, resistant, crumbly, strong HCl reaction	98.52	1.00	0.24	0.054	0.094	265	44	50
121344	Mpk	3	**Lime Packstone to Grainstone**, light grey to tan weathered, medium grey to tan fresh, medium-grained to coarse-grained, fossils: crinoid ossicle, massive, resistant, strong HCl reaction, structure(s): bedding (possible) 129/38 SW	98.50	1.09	0.22	0.050	0.071	257	35	50
121345	Mpk	3	**Lime Packstone to Grainstone**, light grey to tan weathered and fresh, medium-grained to coarse-grained, fossils: crinoid ossicle, massive, resistant, crumbly, strong HCl reaction	98.29	1.19	0.29	0.071	0.084	302	36	50
121346	Mpk	6	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant; crinoid ossicle, massive, resistant, crumbly, strong HCl reaction, structure(s): bedding (possible) 121/25 SW	98.54	1.00	0.23	0.050	0.069	282	33	50
121347	Mpk	6	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant; crinoid ossicle, massive, resistant, crumbly, strong HCl reaction, structure(s): bedding (possible) 121/25 SW	98.72	0.88	0.22	0.049	0.055	260	32	50
121348	Mpk	3	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant, massive, resistant, strong HCl reaction	98.65	0.92	0.22	0.056	0.058	242	33	50
121349	Mpk	3	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant, massive, resistant, strong HCl reaction	98.66	0.90	0.23	0.053	0.059	236	35	50
121350	Mpk	3	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant, massive, resistant, strong HCl reaction	98.49	0.98	0.32	0.080	0.053	265	30	50
121351	Mpk	3	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant, massive, resistant, strong HCl reaction	98.65	0.96	0.21	0.050	0.065	252	33	50
121352	Mpk	3	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant, massive, resistant, strong HCl reaction	98.70	0.98	0.14	0.050	0.056	319	29	50
121353	Mpk	3	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant, massive, resistant, strong HCl reaction	98.74	0.88	0.22	0.046	0.050	261	33	50
121354	Mpk	1.5	**Lime Grainstone**, light grey weathered, light brown to light grey fresh, fine-grained to medium-grained, fossils: fragment (indeterminate), abundant, massive, resistant, strong HCl reaction	98.43	1.09	0.29	0.058	0.041	296	30	50
Section 2016-15 (UTM 580993E, 5801126N)											
121340	Mpk	14	**Lime Packstone to Grainstone**, very-light grey to light grey weathered, light grey to medium grey fresh, medium-grained, fossils: crinoid ossicle, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 98/28 S	98.31	1.17	0.31	0.060	0.060	305	30	50
121341	Mpk	3	**Lime Packstone to Grainstone**, very-light grey to light grey weathered, medium grey fresh, medium-grained, fossils: crinoid ossicle, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 110/36 SW	98.15	1.34	0.28	0.064	0.068	326	32	50

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
121342	Mpk	1	**Lime Packstone to Grainstone**, very-light grey to light grey weathered, medium grey fresh, medium-grained, fossils: fragment (indeterminate), rare; crinoid ossicle, moderately-bedded, resistant, strong HCl reaction, structure(s): bedding (possible) 104/28 SW	96.81	2.43	0.46	0.075	0.129	321	42	50

APPENDIX 3: 2016 MAPPING STATION DESCRIPTIONS

Notes: Bedding attitudes are strike and dip, right-hand rule. Traverses and traverse points are listed chronologically.
Traverse locations are shown on Fig. 4.3.

Abbreviations: HCl - Hydrochloric Acid, E - to the east, W - to the west

Fer - Fernie Formation; Mh - Mount Hawk Formation; Al - Alexo Formation
Pal - Palliser Formation; Ex - Exshaw Formation; Bff - Banff Formation; Pek - Pekisko Formation; Sh - Shunda Formation; Tv - Turner Valley Formation

Location	Unit	Type	Description
Traverse 2016-A W of Dizzy Creek			
AA	Tv	outcrop	Definite bedding: 132°/48°
AB	Tv-Sh	contact	Contact between Turner Valley and Shunda formations at 128° on surface, Turner Valley bedding: 132°/48°, Shunda bedding: 124°/30°
AC	Sh-Pk	contact	Contact between Shunda and Pekisko formations at 130° on surface, bedding: 139°/40°, Pekisko is high-calcium limestone, grey-brown, fresh, light grey weathered, fossil fragments common
AD	Sh-Pk	contact	Contact between Shunda and Pekisko formations at 130° on surface, bedding: 120°/42°, Pekisko is cliff-forming, high-calcium limestone, grey-brown, fresh, light grey weathered, fossil fragments common
AE	Pek-Bff	contact	Sharp contact between Pekisko and Banff formations, bedding: 105°/59°
Traverse 2016-B SE of The Gap			
BA	Pek	outcrop	Top edge of Pekisko cliff, potential fault contact at 128°, runs into previous hill, SW contact is recessive, no outcrop visible until Palliser
BB	Pek	outcrop	Pekisko outcrop (small), definite bedding: 129°/29°
BC	Bff	outcrop	Banff outcrop, shaly, siliceous, thinly-bedded, bedding: 141°/40°
BD	Bff	outcrop	Banff outcrop, shaly, siliceous, thinly-bedded, bedding: 166°/26° and 167°/22°
Traverse 2016-C N of Lundine Creek			
CA	Pal	outcrop	Base of sharp contact of Upper Palliser (Costigan Member) with Lower Palliser (Morro Member) at 298°
CB	Pal	outcrop	Base of sharp contact of Upper Palliser (Costigan Member) with Lower Palliser (Morro Member) at 298°
CC	Bff/Pal	contact	Sharp contact between Banff/Exshaw and Upper Palliser (Costigan Member) formations at 308°, Exshaw is ~2 m thick, deformed and shaly, dark brown-black, Upper Palliser is resistant, cliff-forming
CD	Bff	outcrop	Banff outcrop, shaly, thin-bedded, siliceous, calcareous dolomudstone, on NE limb of anticline, bedding measurements: 297°/40°, 309°/34°, 307°/42°

Location	Unit	Type	Description
CE	Bff	outcrop	Crinoidal grainstone, bedding: 332°/41°
CF	Pal-Bff	contact	Sharp contact between Upper Palliser (Costigan Member) and Banff formations at 296°, bedding: 308°/69°
CG	Bff	outcrop	Banff outcrop, thin, shaly limestone, bedding: 317°/60°
CH	Pek-Sh	contact	Contact between Pekisko and Shunda formations at 316°, impassable cliff, bedding: 304°/60°
CI	Sh-Tv	contact	Gradational contact between Shunda and Turner Valley formations, shaly, definite bedding: 307°/48°
<u>Traverse 2016-D</u>			
N of Trout Creek			
DA	Pek-Sh	contact	Contact between Pekisko and Shunda formations at 245°
DB	Sh-Tv	contact	Approximate contact between Shunda and Turner Valley formations
DC	Sh-Tv	contact	Approximate contact between Shunda and Turner Valley formations
DD	Sh-Tv	contact	Approximate contact between Shunda and Turner Valley formations
DE	Sh-Tv	contact	Sharp contact between Shunda and Turner Valley formations at 240°, bedding: 127°/16°
DF	Sh-Pek	contact	Sharp contact between Shunda and Pekisko formations at 273°, impassable, area to NWN is covered
DG	Sh-Pek	contact	Sharp contact at 303°
DH	Pek-Sh	contact	covered area, potential contact between Pekisko and Shunda formations at 318°
DI	Pek	outcrop	Pekisko outcrop, crinoidal grainstone, bedding: 106°/19°, likely a covered contact between Banff and Pekisko formations
DJ	Bff	outcrop	Contact between Banff and Pekisko formations at ~ 212°, bedding: 89°/16°
DK	Bff-Pek	contact	Contact between the Banff and Pekisko formations at 300°
DL	Pek-Bff	contact	Sharp contact between Pekisko and Banff formations at ~ 228°, Banff formation is recessive, Banff contact at 90°/19° and 96°/15°
DM	Bff	outcrop	Banff outcrop, definite bedding: 104°/17°
DN	Bff	outcrop	Banff outcrop, on edge of hill, bedding measurements: 74°/18°, 82°/22°, 92°/16°, 84°/14°
DO	Bff-Pal	contact	Potential contact between Banff and Upper Palliser (Costigan Member) formations, rubbly, covered interval, no reliable bedding
DP	Pal	outcrop	Upper Palliser (Costigan Member) ridge
DQ	Pal-Bff	contact	Contact between Upper Palliser (Costigan Member) and Banff formations, Upper Palliser dies out into recessive hillside, strike at 308°
DR	Pal	outcrop	View of anticlinal axis at ~ 130°, view of synclinal axis at ~ 150°

APPENDIX 4: ANALYTICAL LABORATORY INFORMATION AND TECHNIQUES

Name and Address of the Lab:

Graymont Western US Inc., Central Laboratory.
670 East 3900 South, Suite 200
Salt Lake City, Utah, 84107

Statement of Qualifications:

Jared Leikam obtained a B.S. in Chemistry from the University of Utah in the class of 2003. Jared started working for Graymont in February of 2004 and has been working with the ICP Spectrometer for two and a half years, under the direct supervision of Carl Paystrup (Lab Supervisor).

Vonda Stuart obtained a B.S. in Chemistry from Weber State University in 2004. Vonda started with Graymont in August of 2007 and started working in the ICP Lab the following September.

Sample Preparation, Procedures, Reagents, Equipment, etc.:

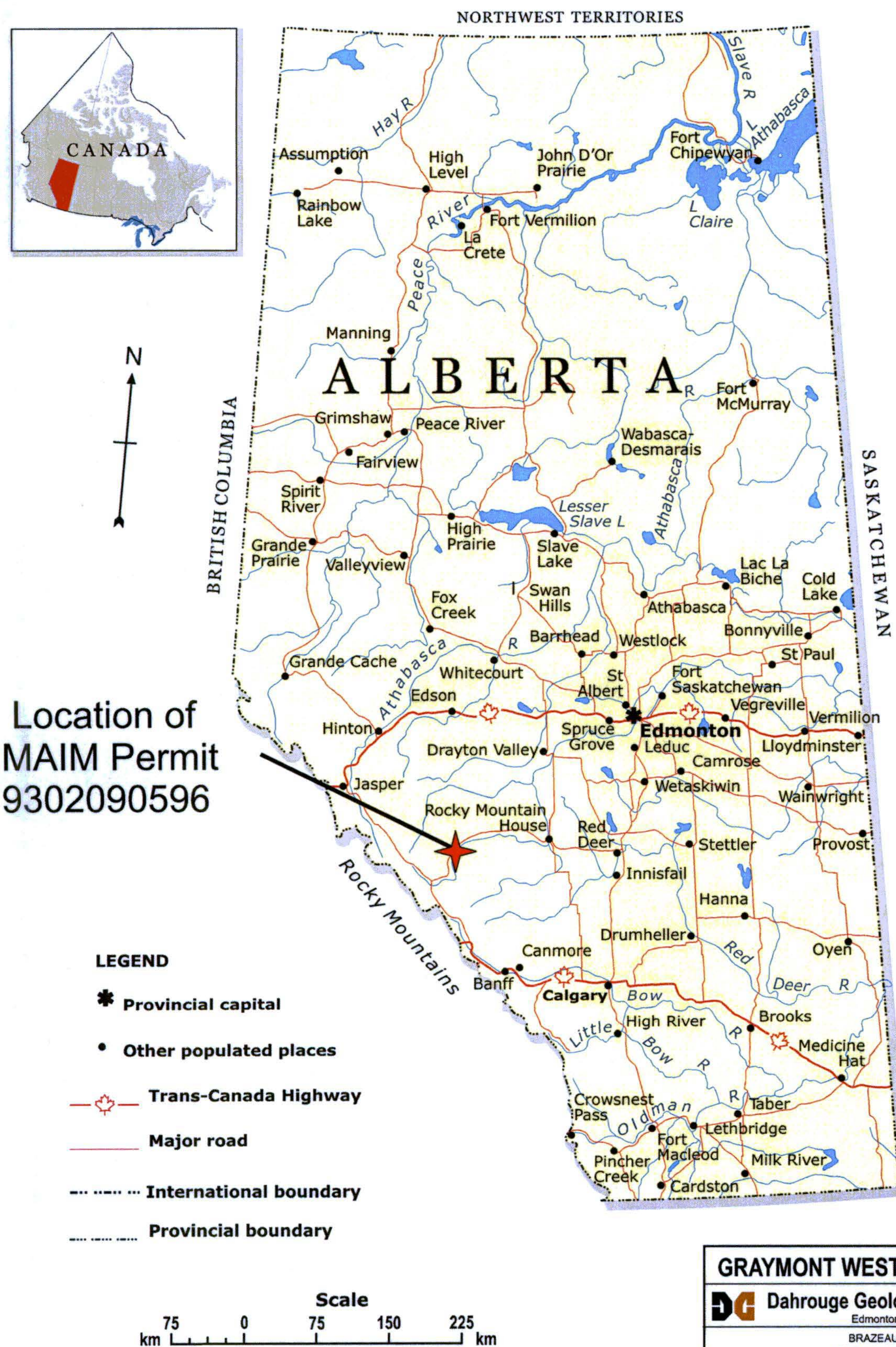
For the ICP sample preparation, 0.5 grams of the sample is mixed with 3 g of lithium carbonate. The sample and the lithium carbonate are then fused together in a muffle furnace at 850℃. Following the fusion process, the samples are dissolved in 1:1 HCl; a total of 40 mL 1:1 HCl is used in the dissolving process. The samples are then diluted to 200 mL and spiked with 10 ppm Co. Cobalt is used as an internal standard. At this point the samples are ready for analysis on the Perkin Elmer, Optima 7300V.

Mesh Size Fraction, Split and Weight of Sample:

Upon receiving the samples, the prep room technician riffles and then splits the stone down to a manageable size (roughly 200 g). The stone is then dried in an oven at 120ºC. Once the samples have been dried they get pulverized to a -200 mesh size. A split of this pulverized material is then sent for testing in the main part of the lab.

Quality Control Procedures:

The ICP spectrometer is calibrated with two certified reference materials prior to analyzing a batch of samples. A batch typically contains 96 samples. Every 12th sample in a batch is a certified limestone reference sample. In addition to the 8 reference samples imbedded in the batch, there are 2 limestone reference samples analyzed at the beginning and at the end of the batch to ensure the accuracy of our Na and P numbers. Every element being analyzed in a sample is backed up by data from the certified reference materials. We also use an internal standard (10 ppm Co) to further ensure the quality and accuracy of the analysis.



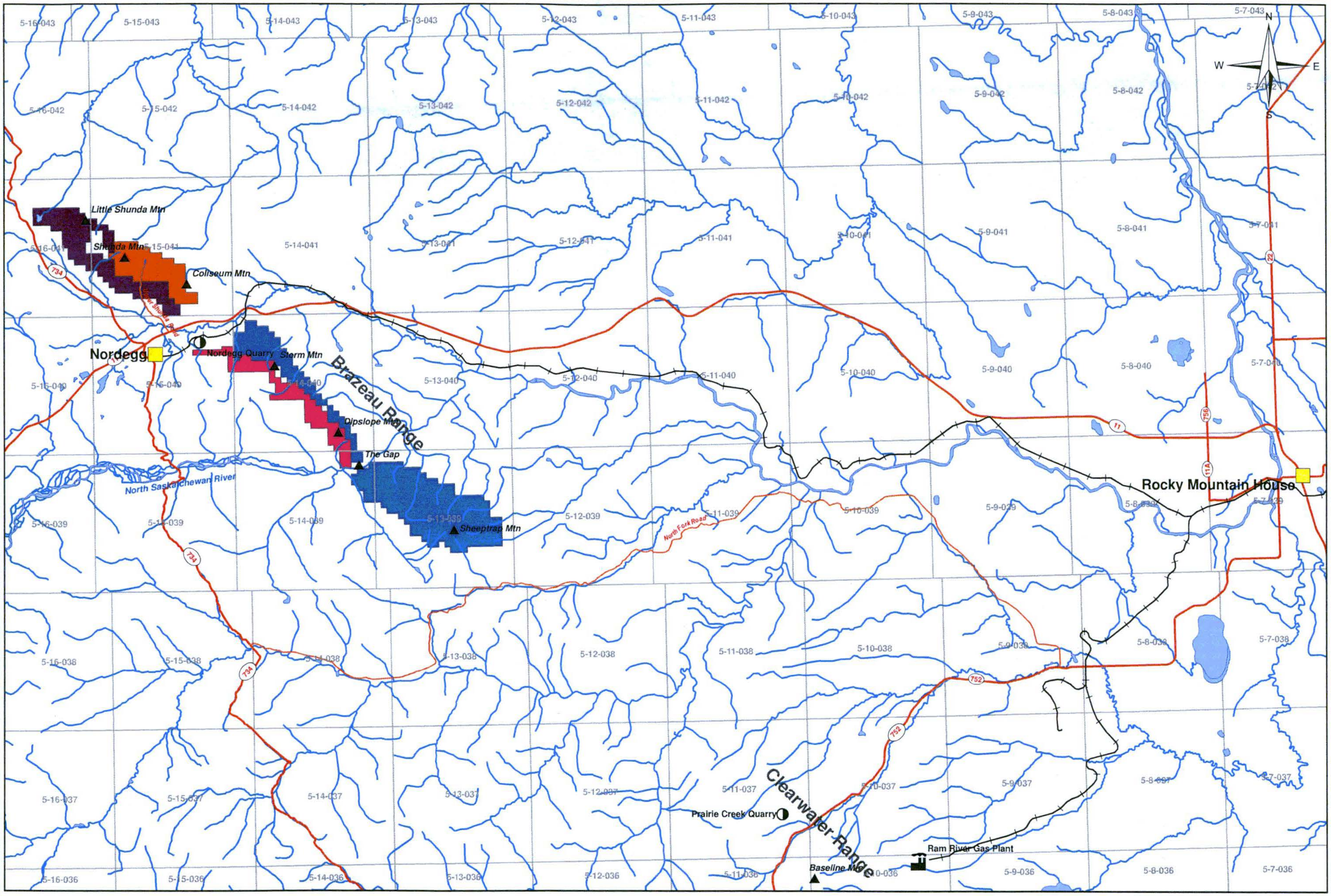
GRAYMONT WESTERN CANADA INC.

Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

BRAZEAU RANGE,
WEST-CENTRAL ALBERTA

Fig. 3.1
Property Location

WM 2014.09



Legend

- Highway
- Secondary Road
- Railway
- Provincial Park
- National Park

Graymont Land Holdings

- Brazeau Range
- Shunda Mountain
- Nordegg South Leae
- Nordegg North Lease

Kilometres

0 2.5 5 10 15 20

1:350,000

Coordinate System: UTM NAD83, Zone 11N

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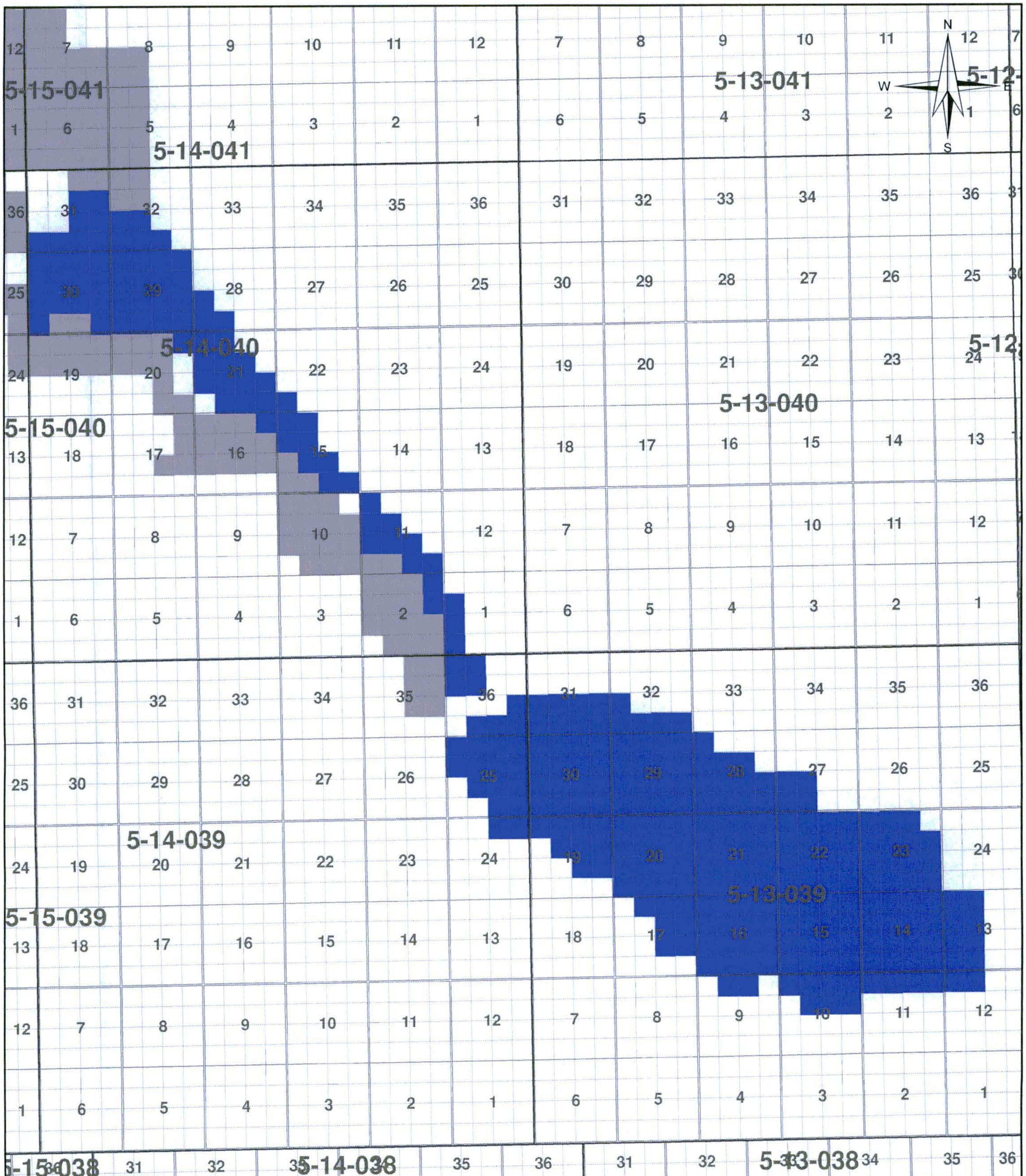
Edmonton, Alberta

BRAZEAU RANGE,
WEST-CENTRAL ALBERTA

Fig 3.2
Access Map

PK 2014.09



Legend

Land Holdings

Permit # 9302090596 (5,056 Ha)

Other Claims

Kilometres

0 1 2 3 4

1:100,000

Coordinate System: UTM NAD83, Zone 11N

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Figure 4.1
Permit Map

WM 2014.09

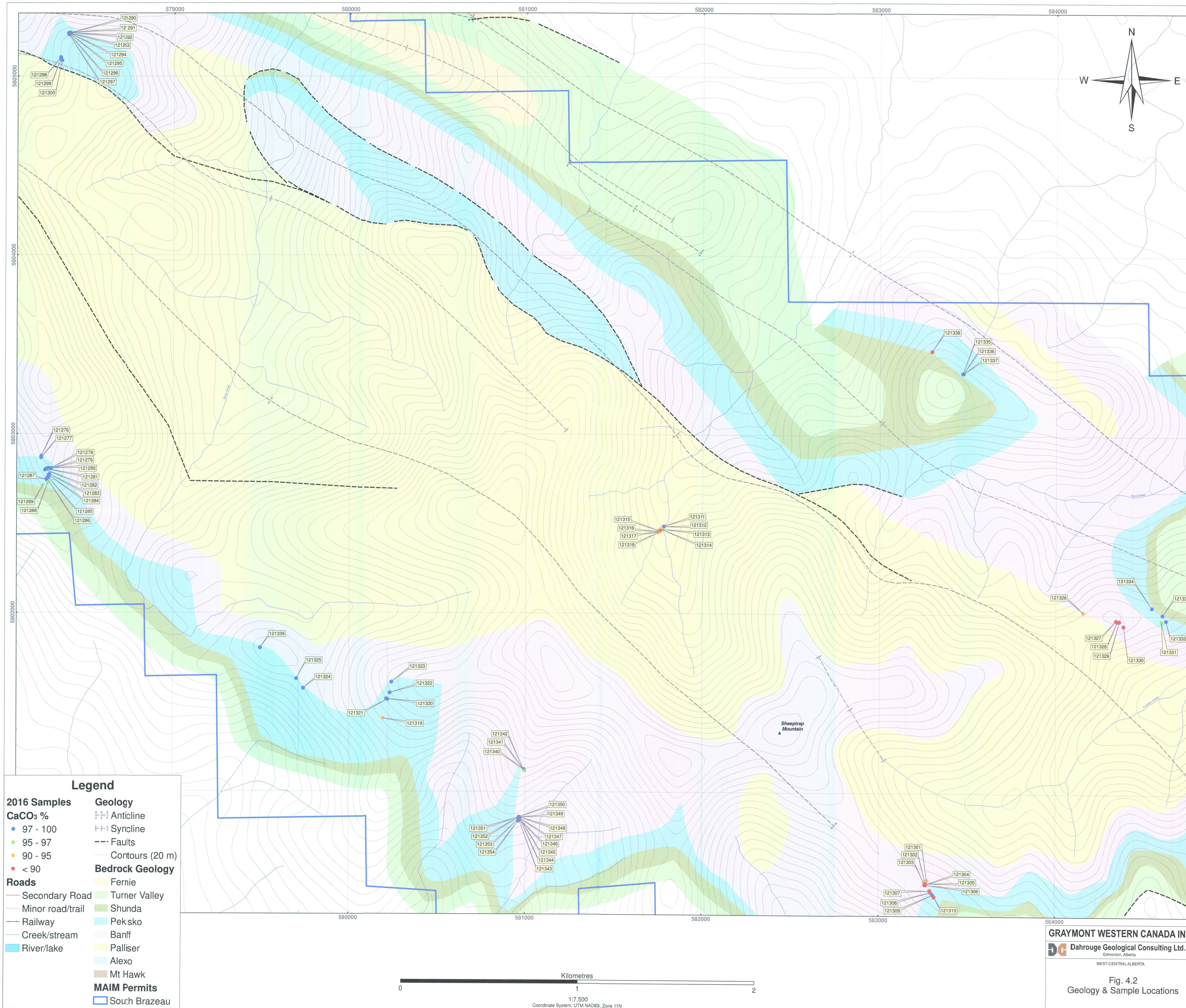
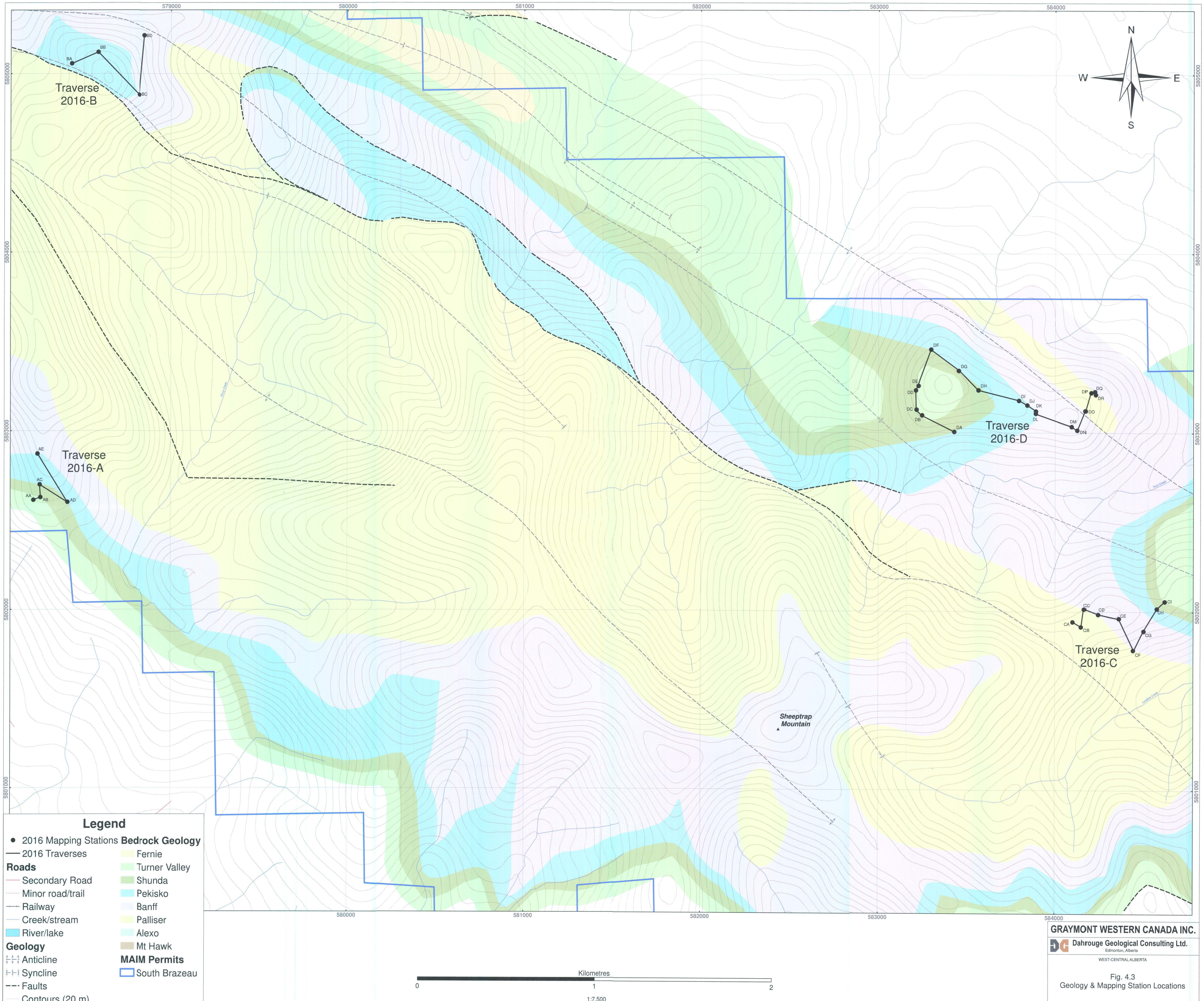


Fig. 4.2
Geology & Sample Locations



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WEST-CENTRAL ALBERTA

Fig. 4.3
Geology & Mapping Station Locations

KK 2016.08