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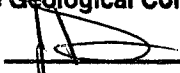
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**GRAYMONT WESTERN CANADA INC.**

**2001 EXPLORATION FOR HIGH-CALCIUM LIMESTONE  
AT CLEARWATER AND LIMESTONE RANGES  
OF WEST-CENTRAL ALBERTA**

Metallic and Industrial Minerals Permits  
9396020019 and 9398100125

Geographic Coordinates

51°58' N to 52°15' N  
115°15' W to 115°35' W

NTS Sheets 82 O/13, O/14, 83 B/3, B/4 and B/5

2002 06 21

by

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1.

## SUMMARY

During July and October, 2001 Paleozoic carbonate units were examined and sampled at Corkscrew Mountain, Marble Mountain, Idlewilde Mountain and Limestone Mountain. At those locations 196 samples were collected at 41 locations. Samples were collected from across approximately 491¼ m, from more than 868¾ m normal thickness of strata examined.

Along the southern parts of Clearwater Range, at Corkscrew Mountain and Marble Mountain, and at Limestone Range, at Idlewilde Mountain and Pineneedle Creek Anticline, carbonate units of the Rundle Assemblage exhibit broad compositional variability. They generally contain between 55 and 98¾ per cent CaCO<sub>3</sub>, between ¼ and 43 per cent MgCO<sub>3</sub>, and between ¼ and 5 per cent SiO<sub>2</sub>. Several intervals with good limestone were identified, however their continuity was not definitively established.

Most samples from the Banff Formation were of lower quality.

2.

## INTRODUCTION

In early 1996 and the later part of 1998 Graymont Western Canada Inc. acquired Metallic and Industrial Minerals Permits (MAIM) to cover limestones of the Rundle Assemblage at two places: one on and near Corkscrew Mountain and one on and near Limestone Mountain. During July and October, 2001, 196 samples were collected from limestone outcrops at Corkscrew and Marble mountains (Clearwater Range), and at Idlewilde and Limestone mountains (Limestone Range). This report includes geologic observations associated with these samples and interpretations of previously collected geological data. Peter Darbyshire, General Manager of Graymont Western Canada Inc. authorized this work.

As previous reports (Pana and Dahrouge, 1998; and Dahrouge, 2000) include descriptions of the geographic setting, environmental considerations, history and previous investigations, and regional geology, most of that information is not repeated herein. New information bearing on these subjects is, however, included.

## 3.

## PROPERTY

## 3.1 MAIM PERMITS

In 1996 and 1998, Graymont Western Canada Inc. (nee: Continental Lime Ltd.) acquired two MAIM permits: 9396020019 on and near Corkscrew Mountain and 9398100125 on and near Limestone Mountain (Fig's. 3.1 and 3.2).

**TABLE 3.1 AMENDMENTS TO MAIM PERMITS  
9398100125 AND 9301010011 OF GRAYMONT WESTERN CANADA INC.**

Permit	Comm. Date	Expiry Date	Land Description (Tp-RW5)	Size (Ha)
<b>Corkscrew Mountain MAIM Permit 9396020019*</b>				
9396020019 (Current)	Feb. 29, 1996	Feb. 28, 2002	35-9W5 (Sections: 5L5,L6,L12,L13; 6L1,L8; 7SE,L3,L6) 35-10W5 (Sections: 1N; 2NE; 11; 12SW,L2,L7,L11-L13; 14S,NWL9,L10,L15; 15L1,L8) 35-11W5 (Sections: 2W,L7,L10,L15,L16; 3; 10SE,L3,L6,L9,L10, L11, L16; 11L4,L5,L12,L13; 12SE,L3,L4,L6,L13,L14; 13L4,L5; 14NE,L1, L8; 15L1, L5-L12,L14,L15; 22L2,L3,L5-L7,L12-14; 23L2,L3,L6,L7, L11,L13,L14; 26L4,L5; 27SW,L2,L7,L8,L11,L12; 28L1,L7,L8)	2640
9396020019 (Reduced)	Feb. 29, 1996	Feb. 28, 2004	35-9W5 (Sections: 5L5,L6,L12,L13; 6L1,L8; 7SE,L3,L6) 35-10W5 (Sections: 1N; 2NE; 11; 12SW,L2,L7,L11-L13; 14S,NW,L9,L10,L15; 15L1,L8) 35-11W5 (Sections: 2W,L7,L10,L16; 3; 10SE,L3,L6,L9,L10, L11, L16; 11L4,L5,L12,L13; 12L1,L2,L3,L4,L6,L7,L13,L14; 13L4,L5; 14NE,L1,L8; 15L1,L6,L11,L12; 22L13,L14; 23L2,L3,L6,L7,L11, L13,L14; 26L4,L5; 27SW,L2,L7,L8,L11,L12; 28L1,L7,L8)	2400
<b>Limestone Mountain MAIM Permit 9398100125*</b>				
9398100125 (Current)	Oct. 30, 1998	Oct. 30, 2002	34-9W5 (Sections: 3L6,L7,L10,L11,L14,L15; 9NE; 10L3,L5,L6,L12,L13; 16SE,NW,L3,L6,L10,L15; 17L6-11,L14,L15; 20NE,L1,L8; 21W; 29SE,NW,L6,L10,L15; 30L10,L14,L15; 31L1-L4,L6-L10; 32SW,L11,L12) 34-10W5 (Sections: 18L9-L11,L14,L15; 19SW,L12,L13; 29S,NW,L9, L10,L15; 30NE,L1,L8,L12,L13; 31SE,NW,L4-L6,L9,L10,L15; 32L3-L5; 36L1) 34-11W5 (Sections: 13L10, L11, L14, L15; 23NE,L8,L13,L14; 25E,L3,L11,L14, 26SW; 33L15,L16; 34L13,L14; 36E,L3,L4,L6) 35-10W5 (Sections: 6L1-L3, L8, L9, L13-L16) 35-11W5 (Sections: 1L9,L15,L16)	2928
9398100125 (Reduced)	Oct. 30, 1998	Oct. 30, 2004	34-9W5 (Sections: 3L6,L7,L10,L11,L14,L15; 9NE; 10L3,L5,L6,L12,L13; 16SE,NW,L3,L6,L10,L15; 20NE,L1,L8; 21W; 29SE,NW,L6,L10,L15; 30L10,L14,L15; 31L1-L4,L6-10; 32SW,L11, L12) 34-10W5 (Sections: 18L9-L11,L14,L15; 19SW; 29L5-L7,L10-L15; 30NE,L1,L8,L12,L13; 31SE,NW,L4-L6,L9,L10,L15; 32L3-5; 36L1) 34-11W5 (Sections: 23NE,L8,L14; 25NE,L11,L14; 26SW; 33L15,L16; 34L13,L14; 36E,L3,L4,L6) 35-10W5 (Sections: 6L1-L3) 35-11W5 (Sections: 1L9,L15,L16)	2352

\* Report deadline is May 28, 2002 plus 30 days.

\* Report deadline is January 21, 2003 plus 30 days.

TABLE 3.2 LOCATIONS EXAMINED AND SAMPLED IN 2001\*

Section Number	Location	Samples	Strat. Thick. (m)*	Measured Thick. (m) <sup>o</sup>
<b><u>Corkscrew Mountain</u></b>				
CS2001-01	Area A0	6	~8½	~59¼
CS2001-02	Area A0	7	16	~33¼
CS2001-03	Area A0	2	4	4
CS2001-04	Area A1	3	16½	7
CS2001-05	Area A1	3	4¼	11½
CS2001-06	Area A1	2	8½	18¼
CS2001-07	Area A1	3	9¼	32
CS2001-08	Area A1	3	4	7
CS2001-09	Area A1	1	1¼	1¼
CS2001-10	Area A1	1	1½	1½
CS2001-11	Area A1	1	8¾	8¾
CS2001-12	Area A2	2	4	4
CS2001-13	Area A2	4	10	11¼
CS2001-14	Area A2	4	9¼	14
CS2001-15	Area A2	2	5¼	5¼
CS2001-16	Area A2	1	7	7
CS2001-17	Area A3	6	13	16¾
CS2001-18	North Slope, Area A3	5	10	11
CS2001-19	Area A3	3	13½	20¼
CS2001-20	Area A3	1	1½	1½
CS2001-21	Area A3	5	14¼	14¼
CS2001-22	Area A3	9	20¼	31½
CS2001-23	Area A3	2	5½	22½
CS2001-24	Area A3	7	8¼	13¾
CS2001-25	North Part of Area A4	5	15¼	34¾
CS2001-26	South Part of Area A3	5	8¼	17¾
CS2001-27	South Part of Area A3	18	28½	68¼
CS2001-28	Area A3	5	4¾	4¾
CS2001-29	North Part of Area A4	15	22	25½
CS2001-30	Oradea Ridge along Forestry Trunk Road	7	22¼	32¼
		138	305¾	540
<b><u>Idlewilde Mountain</u></b>				
ID2001-01	At South end of North Peak	1	10	10
ID2001-02	West Slope of Ridge Crest	1	3	13
ID2001-03	Along Ridge Crest on West Flank	5	12	12
ID2001-04	South Peak	5	11¼	11¼
ID2001-05	About 400 m Southeast of South Peak	5	9¼	95¼
ID2001-06	About 530 m Southeast of South Peak	1	10	10
ID2001-07	South Ridge	10	25½	25½
		28	81	177
<b><u>Marble Mountain</u></b>				
MM2001-01	Main Peak of Eastern Ridge	11	32	34¾
MM2001-02	North Side of Moose Creek	6	18	18
MM2001-03	East of Section 99-17	2	16	16
		19	66	68¾
<b><u>Limestone Mountain (Pineneedle Creek Anticline)</u></b>				
PA2001-01	Core of Pineneedle Creek Anticline	11	38½	83
		11	38½	83
<b>TOTALS:</b>		196	491¼	868¼

\* Stratigraphic thicknesses are sampled thicknesses.

<sup>o</sup> Measured thicknesses are total investigated thicknesses, including covered and unsampled intervals.

MAIM permit 9396020019 is divided into two parts: the eastern part covers Paleozoic limestones along the central part of Clearwater Range at Corkscrew Mountain, while the western Part covers Paleozoic limestones at the north end of Limestone Range at Idlewilde Mountain.

Similarly, the eastern part of MAIM permit 9398100125 covers Palaeozoic limestones along the southern part of Clearwater Range at Marble Mountain and the western part at Limestone Mountain. Based upon the 2001 exploration both the Corkscrew Mountain and Limestone Mountain MAIM Permits are to be reduced (Table 3.1). As indicated in Table 3.1 and Figure 3.2, Permit 9396020019 is to be reduced by 240 ha from 2640 ha to 2400 ha, and Permit 9398100125 is to be reduced by 576 ha from 2928 ha to 2352 ha.

### 3.2 2001 EXPLORATION

During 2001, some 196 samples (Appendices 2 and 3) were collected by chipping outcrops perpendicular to bedding. Where bedding could not be identified, chips were taken in directions appropriate to topography with stratigraphic thickness deduced from other measurements where possible. Samples were collected at locations listed in Table 3.2., over a total stratigraphic thickness of about 491¼ m. A total of 166 samples were collected from the MAIM Permit at Corkscrew Mountain and 30 from the MAIM Permit at Limestone Mountain. The Quality Assurance Laboratory of Graymont Western U.S. Inc. at Salt Lake City, Utah analyzed by standard ICP techniques, the 196 samples collected in 2001 (Appendix 2).

### 3.3 EXPLORATION EXPENDITURES

During 2001 and 2002, exploration expenditures for MAIM permits 9396020019 and 9398100125 totalled \$48,906.82 (Appendix 2). In addition, prior excess expenditures of \$9,463.30 were assigned as follows: \$8,903.30 to MAIM Permit 9396020019 for the assessment period years 5 and 6 and \$560.00 to MAIM Permit 9398100125 for the assessment period years 3 and 4. Combined expenditures of \$58,370.12 for the two permits are assigned as follows:

**TABLE 3.3 ALLOCATION OF EXPENDITURES\***

Permit	Assessment Period	Expected Expiry Date	Permit Area*	Required Expenditures*	Assigned Expenditures*
9396020019	Years 5 & 6	2004-02-29	2400	\$ 24,000.00	\$ 24,000.00
9398100125	Years 3 & 4	2004-10-30	2352	\$ 23,520.00	\$ 23,520.00
Permit 9396020019 Expenditures Carried Over:					\$ 10,850.12
<b>Total:</b>					<b>\$ 58,370.12</b>

\* Based upon the reduced permit areas of Section 3.1



#### 4. REGIONAL GEOLOGY

Clearwater and Limestone Ranges of the Alberta Foothills, were previously mapped according to NTS map sheets by the following officers of the Geological Survey of Canada:

<u>NTS Map Sheet</u>	<u>Reference</u>
82 O/14 W½ (Limestone Mountain)	Ollerenshaw (1968)
82 O/14 E½ (Marble Mountain)	Ollerenshaw (1965)
83 B/3 W½ (Tay River)	Henderson (1944); (1945a)
83 B/4 E½ (Fall Creek)	Henderson (1945b); (1946)
83 B/5 E½ (Saunders)	Erdman (1950)

At Clearwater and Limestone ranges, carbonate lithologies are known to occur within both Palaeozoic and Mesozoic sequences. Palaeozoic limestones are described in the Upper Devonian Palliser Formation, Upper Devonian to Lower Carboniferous Banff Formation and the Lower Carboniferous Rundle Assemblage. Limited quantities of limestone are produced from the upper part of the Banff Formation and the lower part of the Rundle Assemblage at the Limeco Quarry at the south end of Corkscrew Mountain. Mesozoic carbonate rocks are known in the Nordegg Member of the Fernie Group.

As previous reports (Pana and Dahrouge, 1998; and Dahrouge, 2000) include detailed descriptions of the stratigraphy and structure of Clearwater and Limestone ranges, that information is not repeated herein. New information bearing on these subjects is, however, included.

#### 5. CORKSCREW MOUNTAIN AND MARBLE MOUNTAIN

Corkscrew Mountain, Oradea Ridge and Marble Mountain form the southern part of Clearwater Range west of Caroline, Alberta. Corkscrew Mountain and parts of Oradea Ridge are within MAIM Permit 9396020019 and Marble Mountain is within MAIM Permit 9398100125, both are held by Graymont Western Canada Inc.

The Banff Formation and Rundle Assemblage at Clearwater Range have been examined by several authors including Erdmer (1986), Holter (1990), Hamilton (1993), Pana and Dahrouge (1998), and Dahrouge (2000).

## 5.1 LOCATION AND ACCESS

Access to Marble Mountain is from Caroline, about 30 km westerly on secondary road 591 to a southerly branch of Forestry Trunk Road 40 (Fig. 3.1). This branch of the Forestry Trunk Road is about 4 km east of Limeco Quarry. It continues southerly and is approximately parallel to Marble Mountain at a distance of about 3 km. Approximately 11 km along a gravel road branches to the west along Teepee Pole Creek and continues beyond the Lease of Big Horn Cement Inc. at the south end of Marble Mountain, thence to a gas installation on its western flank. Several seismic lines passable by either ATV or by foot cross Marble Mountain.

From the Limeco Quarry at the south end of Corkscrew Mountain Forestry Trunk Road 40 continues northwest for about 5 km along the west flank of Corkscrew Mountain. There it turns westerly and continues on to Idlewilde Mountain.

## 5.2 STRUCTURE

At Clearwater Range are a series of northwest trending anticlines and synclines, from southwest to northeast: Corkscrew Mountain Anticline, Corkscrew Mountain Syncline, and Marble Mountain Anticline (Ollerenshaw, 1968). The southwest limb of Corkscrew Mountain Anticline is cut by the southwest dipping Corkscrew Mountain Thrust, and its east limb is cut by an east-dipping backthrust. A detailed account of the pertinent structures is provided by Dahrouge (2000).

Prominent dip-slopes and partial dip-slopes are present along the west flank of Corkscrew Mountain, with dips of between 10° to 40° SW. Along the northwestern part of Corkscrew Mountain, dipslopes at Areas A0 to A4, are underlain by Paleozoic limestones of the Banff Formation and Rundle Assemblage (Fig.'s 4.1 to 4.3).

North of Clearwater River, near the northern terminus of the Marble Mountain Anticline, dips vary from 20° to 80°. A dip-slope on the west flank of Oradea Ridge, with dips of 20° to 50° SW, is underlain by the Rundle Assemblage (Fig. 4.1).

South of Clearwater River the northwest trending Marble Mountain Anticline exposes Palaeozoic strata on both flanks of Marble Mountain over a distance of about 11 km. Marble Mountain Anticline is approximately symmetrical with dips of between 55° and 70°. Near its south end, at Teepee Pole Creek, dips shallow to between 15° to 40°.

### 5.3 STRATIGRAPHY AND COMPOSITION OF LIMESTONE

Palaeozoic limestones of the Mississippian Banff Formation and the Rundle Assemblage are exposed on Corkscrew Mountain, Oradea Ridge, and Marble Mountain (Fig. 4.1). The Banff Formation consists of thin-bedded argillaceous and calcareous siltstone, and silty limestone. It is more than 200 m thick.

Along the southwest flank of Corkscrew Mountain the lower part of the Rundle Assemblage exceeds 65 m (Dahrouge, 2000). Due to poor exposure, thickness and correlation of the various subunits of the Rundle Assemblage is uncertain (Fig. 4.3). Limited examinations along Marble Mountain Anticline at Oradea Ridge and Marble Mountain (Fig. 4.4), indicated similar stratigraphy to that observed at Corkscrew Mountain (Table 5.1).

At Oradea Ridge, two intervals with appreciable thicknesses of coarse-grained limestone are separated by approximately 10 m of dolomite and dolomitic limestone (Appendix 3, Table 5.1).

At Marble Mountain, the Rundle Assemblage forms a peripheral strip for its approximate 11 km length (Fig. 4.1). Just north of Moose Creek, near the main peak of Marble Mountain, about 17¾ m of medium- to coarse-grained calcarenite are exposed (MM2001-01; Appendix 3). About 3 km to the west, at the bottom of Moose Creek Valley, a near flat lying exposure, consists of approximately 18 m of micritic limestone with a few interbeds of coarse wackestone. The foregoing carbonate exposures may represent the thickest limestone units examined along Clearwater Range (Table 5.1).

## 6. IDLEWILDE MOUNTAIN AND PINENEEDLE CREEK ANTICLINE

Idlewilde Mountain, Limestone Mountain and Pineneedle Creek Anticline form Limestone Range, about 10 km west of Clearwater Range in west-central, Alberta. Idlewilde Mountain is within MAIM Permit 9396020019, and Limestone Mountain and Pineneedle Creek Anticline are within MAIM Permit 9398100125, both are held by Graymont Western Canada Inc. The northern most part of Pineneedle Creek Anticline along Limestone Creek is held under a MAIM Lease of Big Horn Cement Inc.

The Banff Formation and Rundle Assemblage have been examined at Limestone Range by Pana and Dahrouge (1998), and Dahrouge (2000).

TABLE 5.1

**SECTIONS OF LIMESTONE  
AT CLEARWATER RANGE (Fig's. 4.1 and 4.2)**

Section	Thick. (m)	Quality (%)		
		CaCO <sub>3</sub>	MgCO <sub>3</sub>	SiO <sub>2</sub>
<b><u>Corkscrew Mountain</u></b> (Area A0 and A1)				
CS-2001-02	~33¼*	80 - 98½	1 - 17¾	¼ - 1¾
<b><u>Corkscrew Mountain</u></b> (Area A3 and A4)				
CS-2001-17	~16¾*	83¾ - 97½	1½ - 14	< 1½
CS-2001-22	~28*	65½ - 98½	1 - 33	< 1¼
CS-2001-27	~50½*	57 - 98¼	1 - 40	¼ - 3
<b><u>Oradea Ridge</u></b>				
CS-2001-30°	~32¼	95½ - 99	<1 - 3½	< 1
<b><u>Marble Mountain</u></b> (Moose Creek)				
MM-2001-01	30	75 - 98¾	< 22¾	< 1¼
MM-2001-02	18	97 - 98¼	< 1¾	< ¾

\* Includes some covered intervals

° Includes some covered intervals and unsampled dolomite

## 6.1 LOCATION AND ACCESS

The northern parts of Limestone Range are about 55 km southwest of Rocky Mountain House, Alberta. Idlewilde Mountain encompasses those parts north of Clearwater River and Limestone Mountain to the south. Limestone Range is about 10 km west of, and approximately parallel to Clearwater Range.

Idlewilde Mountain is approximately 10 km westerly from the north end of Corkscrew Mountain. The central portions of Idlewilde Mountain are reached via cut lines and recently constructed logging roads that lead from Forestry Trunk Road 40. It provides improved access to the central parts of Idlewilde Mountain.

The northern parts of Limestone Mountain are accessible via the same spur of the Forestry Trunk Road that provides access to the southern parts of Idlewilde Mountain. This improved gravel road branches south from the road along Clearwater River and Cutoff Creek and follows Rocky Creek for about 3 km to a Shell gas well. It provides access to the northern parts of Pineneedle Creek Anticline.

## 6.2 STRUCTURE

As Dahrouge (2000) provides a detailed account of the structural geology at Limestone Range most of that information is not repeated herein. However, information pertinent to those locations examined during 2001 is provided.

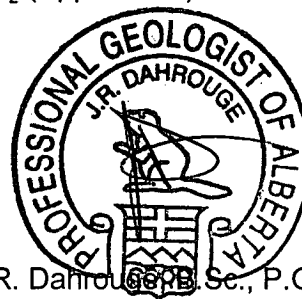
North of Clearwater River, the relevant structural elements include Idlewilde Mountain Anticline with its axis along the crest of Idlewilde Mountain. The northerly plunging Idlewilde Mountain Anticline is an asymmetrical frontal anticline with dips from 5° to 35°W on the west flank and dips from 65° to 80° E on the east flank (Fig's. 4.1 and 5.1). South of Clearwater River, on the eastern flank of Limestone Mountain, the northwest trending Pineneedle Creek Anticline exposes Paleozoic strata on both flanks of Pineneedle Creek Anticline (Fig. 5.2).

## 6.3 STRATIGRAPHY AND COMPOSITION OF LIMESTONE

Samples of the Rundle Assemblage were chipped from outcrops along the east flank of Idlewilde Mountain and at Pineneedle Creek Anticline on the east flank of Limestone Mountain.

At Idlewilde Mountain sampled thicknesses of good limestone were across stratigraphic thicknesses of up to 25½ m (Section ID2001-07; Fig. 4.1; Appendix 3). This exposure consisted of about 9½ m of coarse grainstone, overlain by about 7¾ m of dolomitic limestone, which in turn is overlain by an approximately 8¼ m interval grainstone. The entire interval averaged about 90½ per cent CaCO<sub>3</sub>, about 8¾ per cent MgCO<sub>3</sub>, and less than ½ per cent SiO<sub>2</sub>.

To the south, at Pineneedle Creek Anticline, limestone units within the Rundle Assemblage occur over an interval of up to 83 m. They contain between 63 to 98¾ per cent CaCO<sub>3</sub>, less than 1 per cent to 34¼ per cent MgCO<sub>3</sub>, and up to 1½ per cent SiO<sub>2</sub> (Appendix 3).



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7.

## REFERENCES

- Dahrouge, J.D. (2000) Exploration for High-Calcium Limestone at Clearwater and Limestone Ranges of West-Central Alberta; ass. rept. On MAIM Permits 9396020019 and 9398100125 for Continental Lime Ltd., Dahrouge Geological Consulting Ltd., 20 p., 5 App., 10 Fig., 5 Tables.
- Erdman, O.A. (1950) Alexo and Saunders map-areas, Alberta; Geol. Surv. Can. Mem. 254.
- Erdmer, P. (1986) Geological survey of part of the Limeco Quarry near Clearwater, Alberta; unpublished rept. prepared for Limeco Products Ltd. (not available for consultation).
- Hamilton, W.N. (1993) Mineral resource availability for pulp and paper chemicals in Alberta; Alta. Geol. Surv., Alta. Res. Coun. Cont. No. 2150., p. 28 - 38.
- Henderson, J.F. (1944) Tay River map-area, Alberta; Geol. Surv. Can. Paper 44-26.
- \_\_\_\_\_ (1945a) Tay River; Geol. Surv. Can. Map 840A.
- \_\_\_\_\_ (1945b) Fall Creek map-area, Alberta; Geol. Surv. Can. Paper 45-19.
- \_\_\_\_\_ (1946) Fall Creek; Geol. Surv. Can. Map 883A.
- Holter, M.E. (1990) An evaluation of Alberta limestones for use as paper filler materials; Alta. Geol. Surv., Alta. Res. Coun. Open File Rept. 1990-11., 63 p., 30 figs., 3 appendices.
- Ollerenshaw, N. C. (1965) Burnt Timber Creek: Geol. Surv. Can., Map 11-1965 (with marginal notes).
- \_\_\_\_\_ (1968) Preliminary account of the geology of Limestone Mountain map-area, southern Foothills, Alberta; Geol. Surv. Can. Paper 68-24.
- Pana, D., and Dahrouge, J., (1998) 1997 Exploration Near Corkscrew and Idlewilde Mountains, West-Central Alberta; ass. rept. On MAIM Permit 9396020019 for Continental Lime Ltd., Halferdahl and Associates (a division of Dahrouge Geological Consulting Ltd.), Alta. Geol. Surv. Index No. 19980013, Edmonton, 17 p., 8 App., 6 Fig., 4 Tables.

## APPENDIX 1: CONTINUED

d) <u>Instrument Rental</u>	n/a		
e) <u>Drilling</u>	n/a		
f) <u>Analyses</u>			
	196 samples @ \$ 35.00 sample preparation, analysis for 13 constituents by ICP and LOI (Salt Lake City)		\$ 6,860.00
g) <u>Report</u>	Reproduction and assembly	\$ 178.10	
			\$ 178.10
h) <u>Other</u>			
	Base map(s) and map reproductions	\$ 209.99	
	Courier and Shipping	\$ 754.70	
	Field Supplies	\$ 148.20	
	Long distance telephone	\$ 4.22	
			\$ 1,117.11
<u>Total</u>			<u>\$ 48,906.82</u>

I, Jody R. Dahrouge, hereby certify that the costs outlined above were expended for the assessment of metallic and industrial minerals permits 9396020018 and 9398100125.

Jody R. Dahrouge, B.Sc., Ph.D., Pr. Geol.

Commissioner for Oaths

JACK LAMOUREUX  
COMMISSIONER FOR OATHS  
COMMISSION EXPIRES  
MAY 21, 2005

**APPENDIX 1: ITEMIZED COST STATEMENT FOR METALLIC AND INDUSTRIAL  
MINERALS PERMITS 9396020019 AND 9398100125 OF GRAYMONT WESTERN CANADA INC.**

**a) Personnel**

J. Dahrouge, B.Sc., P.Geol.

9.0	days	field work and travel between July 7 to 15, 2001	
16.8	days	preparations for field, organizing, supervising and preparing report	
<u>25.8</u>	days		

S. Fraser, M.Sc., P.Geol.

7.0	days	field work and travel between October 17 to 23, 2001	
24.5	days	planning and preparing for field work, organizing, preparing and describing samples, compiling field data	
<u>31.5</u>	days		

W. McGuire, (Draftsman, Field Assistant)

8.7	days	field work and travel between July 7 to 15, 2001	
9.7	days	compiling field data; drafting; preparing figures and maps	
<u>18.4</u>	days		

R. Grywul, B.Sc. (Geologist)

7.0	days	field work and travel between October 17 to 23, 2001	
6.3	days	plotting unit contacts and sample locations	
<u>7.0</u>	days		

M. Smith, M.Sc. (Geologist)

5.0	days	assist with report writing, preparing figures	
<u>5.0</u>	days		

B. Blackney, B.Sc. (Geologist)

5.0	days	field work and travel between July 7 to 11, 2001	
<u>5.0</u>	days		

K. McGuire (Assistant)

5.0	days	field work and travel between July 7 to 11, 2001	
<u>5.0</u>	days		

\$ 35,711.00

**b) Food and Accommodation**

42 man-days @ \$ 26.62	accommodations (motel)	\$ 1,109.87
42 man-days @ \$ 24.72	groceries and restaurants	\$ 1,030.86

\$ 2,140.73

**c) Transportation**

Vehicles:	Quad and Trailer Rental (7 days @ \$115.00)	\$ 805.00
	Quad Rental (10 days)	\$ 850.00
	4x4 sports utility truck 2002 km @ 0.38	\$ 760.76
	4x4 sports utility truck 1274 km @ 0.38	\$ 484.12

\$ 2,899.88



**APPENDIX 2: ANALYTICAL REPORTS FROM THE QUALITY ASSURANCE LABORATORY  
OF GRAYMONT WESTERN CANADA INC.\***

Sample	%	%	%	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	%
	CaCO3	MgCO3	Fe2O3	Al2O3	SrCO3	MnO	SiO2	BaO	K2O	Na2O	P2O5	TiO2	Total	LOI	S
10503°	86.65	8.79	0.382	0.588	481	106	3.11	20	3296	183	<100	280	99.96	42.61	0.071
10504°	94.42	4.55	0.072	0.125	367	50	0.68	6	572	142	<100	56	99.97	43.81	0.029
10505°	98.60	0.87	0.030	0.044	357	25	0.34	3	136	142	<100	8	99.96	43.77	0.020
10506°	93.71	5.66	0.045	0.046	316	32	0.41	7	163	144	161	8	99.96	43.99	0.017
10507°	95.43	3.96	0.038	0.042	364	25	0.40	4	136	154	146	7	99.95	44.06	0.018
10508°	98.39	0.88	0.040	0.028	372	20	0.17	2	83	143	<100	5	99.57	43.70	0.023
10509°	98.13	1.04	0.031	0.035	452	18	0.35	3	126	141	<100	20	99.66	43.69	0.022
10510	93.20	5.79	0.040	0.058	303	28	0.59	4	215	145	<100	19	99.75	44.13	0.011
10511	95.48	3.91	0.043	0.049	323	25	0.36	3	189	152	108	20	99.92	43.80	0.011
10512	96.10	3.06	0.032	0.052	344	25	0.27	3	186	117	101	22	99.60	43.98	0.020
10513	97.80	1.57	0.037	0.043	316	29	0.12	3	102	91	<100	8	99.63	43.89	0.016
10514	89.21	9.28	0.084	0.104	492	24	0.93	5	536	159	100	47	99.73	44.16	0.051
10515	97.95	0.94	0.031	0.031	337	19	0.22	3	89	112	<100	7	99.24	43.49	0.013
10516	98.17	0.85	0.024	0.045	362	19	0.26	3	140	133	107	12	99.43	43.65	0.015
10517	90.40	8.52	0.045	0.080	287	29	0.67	3	331	126	162	30	99.82	44.06	0.015
10518	71.88	26.45	0.092	0.149	240	34	1.24	14	666	143	251	71	99.96	45.18	0.012
10519	63.99	34.11	0.087	0.183	202	35	1.46	6	681	137	363	86	99.99	45.85	0.014
10520	87.85	9.70	0.084	0.150	562	27	1.79	9	752	110	163	86	99.75	43.70	0.040
10521	55.71	43.49	0.060	0.068	143	145	0.52	4	220	264	135	34	99.94	47.09	0.011
10522	97.96	1.47	0.024	0.047	368	25	0.34	3	157	133	<100	11	99.91	43.98	0.014
10523	98.53	0.97	0.021	0.052	391	21	0.32	3	168	122	<100	17	99.96	43.74	0.015
10524	98.21	1.10	0.022	0.059	365	25	0.51	4	222	141	<100	19	99.98	43.85	0.015
10525	97.99	1.53	0.029	0.056	333	32	0.31	3	221	117	139	18	99.99	43.71	0.010
10539°	92.39	2.26	0.475	0.779	470	88	3.48	75	3858	187	<100	454	99.90	41.72	0.080
10540°	97.96	1.05	0.047	0.123	487	32	0.64	8	460	133	<100	64	99.95	43.53	0.018
10541°	98.33	0.97	0.023	0.053	469	23	0.52	4	133	140	<100	18	99.97	43.58	0.022
10542°	98.60	0.96	0.021	0.046	477	19	0.20	4	112	125	<100	24	99.91	43.96	0.023
10543°	98.23	0.88	0.019	0.031	431	16	0.20	3	68	134	<100	13	99.42	43.91	0.023
10544°	98.23	0.75	0.018	0.048	396	18	0.18	3	58	134	<100	6	99.28	43.43	0.016

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\* As received by electronic mail.

° Sample not from MAIM Permit 9396020019 nor 9398100125.

**APPENDIX 2: CONTINUED**

Sample	%	%	%	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	%
	CaCO3	MgCO3	Fe2O3	Al2O3	SrCO3	MnO	SiO2	BaO	K2O	Na2O	P2O5	TiO2	Total	LOI	S
10545°	98.34	0.73	0.021	0.039	349	17	0.24	6	93	125	238	8	99.46	43.39	0.013
10546°	98.22	0.75	0.027	0.039	334	20	0.19	4	86	125	<100	21	99.28	43.43	0.009
10547°	97.94	1.40	0.038	0.085	409	21	0.40	6	221	138	224	33	99.97	43.56	0.013
10548°	97.17	1.20	0.049	0.104	423	21	0.53	8	304	128	<100	35	99.15	43.52	0.017
10549°	98.04	1.14	0.041	0.068	424	20	0.60	5	192	134	<100	24	99.97	43.45	0.017
10550°	92.91	6.12	0.051	0.089	359	23	0.70	5	207	152	130	37	99.96	43.75	0.021
10934°	93.08	1.73	0.056	0.087	345	25	4.94	5	259	136	170	34	99.99	41.58	0.032
10935°	93.76	4.37	0.034	0.047	292	20	1.64	4	145	133	<100	25	99.91	43.30	0.024
10936°	55.23	25.50	0.211	0.104	150	41	17.33	4	388	129	<100	52	98.46	34.61	0.014
10937°	71.13	8.29	0.196	0.066	250	28	20.17	3	175	145	<100	23	99.91	34.33	0.016
10938°	61.84	34.90	0.138	0.277	212	38	2.57	8	1253	121	275	132	99.93	45.01	0.020
10939°	63.48	34.63	0.092	0.194	187	42	1.44	6	876	139	<100	113	99.97	45.55	0.016
10940°	96.58	1.64	0.033	0.063	371	21	0.54	4	258	166	<100	18	98.93	43.09	0.014
10941°	63.49	32.38	0.219	0.480	329	44	2.15	12	2538	263	176	288	99.08	44.57	0.056
10942°	86.36	12.20	0.046	0.085	238	32	0.67	4	316	107	<100	41	99.43	44.29	0.014
10943°	59.17	38.11	0.106	0.369	190	53	1.90	9	1844	188	173	170	99.93	45.30	0.022
10944°	64.04	34.64	0.090	0.163	200	54	0.92	6	700	130	<100	93	99.98	45.50	0.014
10945°	81.55	16.57	0.059	0.084	203	42	0.64	4	337	185	146	35	99.00	44.51	0.012
10946°	93.88	5.12	0.056	0.093	322	32	0.53	4	348	160	<100	57	99.77	43.72	0.017
10947	97.29	1.44	0.033	0.053	405	19	0.35	3	200	100	<100	22	99.24	43.54	0.011
10948	98.76	0.82	0.026	0.050	360	21	0.25	3	174	91	<100	25	99.98	43.55	0.016
10949	98.73	0.82	0.021	0.044	342	20	0.25	3	142	85	<100	20	99.93	43.50	0.015
10950	98.14	0.96	0.038	0.061	442	28	0.30	3	187	106	<100	28	99.57	43.65	0.014
10951	75.66	22.76	0.111	0.171	283	37	1.07	6	737	129	<100	79	99.91	45.09	0.014
10952	90.97	7.36	0.052	0.132	432	36	0.91	6	583	115	1190	60	99.67	43.80	0.021
10953	98.03	0.99	0.027	0.044	547	20	0.43	9	142	108	284	11	99.63	43.57	0.027
10954	97.68	1.59	0.040	0.079	443	20	0.50	4	301	107	<100	30	99.98	43.78	0.020
10955	97.00	0.99	0.042	0.091	469	22	0.55	4	344	131	<100	29	98.77	42.99	0.018
10956	98.36	0.85	0.035	0.061	443	22	0.56	4	253	84	213	21	99.97	43.64	0.018
10957	97.43	0.97	0.026	0.065	488	22	0.53	4	255	94	112	19	99.12	43.35	0.022
10958	98.15	1.17	0.018	0.041	475	20	0.34	4	103	125	130	18	99.80	43.90	0.027

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° Sample not from MAIM Permit 9396020019 nor 9398100125.

APPENDIX 2: CONTINUED

Sample	%	%	%	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	%
	CaCO3	MgCO3	Fe2O3	Al2O3	SrCO3	MnO	SiO2	BaO	K2O	Na2O	P2O5	TiO2	Total	LOI	S
10959	98.05	1.04	0.016	0.027	512	18	0.24	3	70	126	149	4	99.46	43.86	0.029
10960	95.27	3.10	0.063	0.085	282	51	0.98	6	276	100	<100	34	99.57	43.50	0.011
10961	92.52	6.24	0.054	0.060	199	47	0.52	3	132	74	<100	32	99.44	43.98	0.006
10962	97.82	0.99	0.030	0.048	416	18	0.20	4	138	122	<100	20	99.16	43.74	0.018
10963	98.91	0.81	0.019	0.033	384	19	0.12	3	79	128	121	7	99.97	43.80	0.010
10964	98.62	0.90	0.032	0.056	346	22	0.29	4	173	141	<100	21	99.96	43.70	0.017
10965	96.34	2.61	0.033	0.068	393	19	0.67	4	230	145	142	25	99.82	43.75	0.022
10966	97.56	1.21	0.038	0.044	412	20	0.95	3	156	139	149	14	99.90	43.46	0.031
10967	98.27	1.04	0.049	0.064	497	25	0.48	6	191	121	<100	18	99.99	43.70	0.029
10968	95.59	3.55	0.032	0.063	512	23	0.64	4	202	108	172	24	99.98	43.77	0.030
15251	98.39	1.09	0.033	0.045	461	17	0.27	3	130	130	<100	12	99.90	43.84	0.023
15252	93.57	5.30	0.154	0.084	396	34	0.58	4	320	129	<100	35	99.77	44.00	0.018
15253	98.30	1.07	0.046	0.054	429	19	0.38	3	155	131	<100	18	99.92	43.69	0.020
15254	97.53	1.20	0.036	0.044	420	19	0.56	3	144	128	<100	14	99.44	43.75	0.028
15255	88.20	10.03	0.056	0.075	342	26	1.30	3	228	142	126	31	99.76	44.07	0.009
15256	80.67	17.61	0.110	0.112	368	52	1.26	5	517	164	<100	65	99.87	44.70	0.038
15257	90.24	7.89	0.098	0.144	564	35	1.28	6	719	170	<100	86	99.82	44.13	0.051
15258	62.64	35.77	0.040	0.031	189	70	0.75	6	70	210	<100	8	99.28	46.09	0.009
15259	87.62	9.69	0.084	0.135	481	35	1.58	6	670	176	<100	85	99.26	43.89	0.051
15260	91.32	7.55	0.043	0.059	333	24	0.53	3	245	143	<100	24	99.58	44.06	0.019
15261	94.88	3.84	0.035	0.054	316	25	0.54	2	215	128	<100	18	99.41	43.68	0.010
15262	90.78	7.99	0.032	0.090	464	22	0.97	4	462	178	<100	37	99.99	44.01	0.065
15263	88.93	9.45	0.040	0.101	487	24	1.30	8	521	164	<100	37	99.95	44.01	0.061
15264	86.12	12.10	0.057	0.117	365	27	1.38	4	565	143	282	55	99.92	44.19	0.022
15265	97.04	1.56	0.033	0.077	422	23	0.86	3	311	128	<100	30	99.66	43.47	0.018
15266	95.14	3.56	0.029	0.049	326	32	0.30	3	145	109	<100	14	99.14	43.82	0.008
15267	98.05	1.10	0.022	0.053	429	22	0.28	2	156	111	<100	14	99.58	43.73	0.020
15268	97.47	1.13	0.060	0.167	504	36	0.79	7	704	123	<100	88	99.76	43.59	0.029
15269	97.25	2.05	0.029	0.050	437	24	0.22	2	167	94	<100	16	99.66	43.67	0.014
10901	96.15	2.85	0.032	0.056	342	36	0.34	3	214	97	<100	20	99.51	43.71	0.015
10902	97.31	1.24	0.023	0.056	346	27	0.32	3	199	105	134	18	99.03	43.52	0.019

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° Sample not from MAIM Permit 9396020019 nor 9398100125.

**APPENDIX 2: CONTINUED**

Sample	%	%	%	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	%
	CaCO3	MgCO3	Fe2O3	Al2O3	SrCO3	MnO	SiO2	BaO	K2O	Na2O	P2O5	TiO2	Total	LOI	S
10903	97.53	1.14	0.024	0.040	438	19	0.55	9	113	110	211	9	99.37	43.68	0.025
10904	97.78	1.23	0.036	0.052	394	20	0.77	3	173	116	129	22	99.95	43.78	0.026
10905	92.56	6.11	0.042	0.063	317	27	0.50	3	245	137	218	23	99.37	43.75	0.018
10906	97.84	1.29	0.031	0.061	359	24	0.40	3	200	120	<100	23	99.70	43.71	0.014
10907	97.65	1.26	0.035	0.063	431	18	0.79	3	263	120	155	20	99.90	43.59	0.019
10908	97.58	1.83	0.035	0.046	300	76	0.40	2	150	97	173	14	99.98	43.84	0.132
10909	98.22	1.33	0.033	0.044	376	23	0.22	2	144	118	<100	13	99.91	43.83	0.008
10910	97.90	1.17	0.029	0.045	377	22	0.27	2	151	104	<100	12	99.48	43.60	0.014
10911	96.08	3.42	0.032	0.047	356	23	0.29	3	152	118	<100	13	99.93	43.79	0.015
10912	91.62	7.48	0.036	0.046	326	26	0.25	2	149	140	<100	16	99.51	44.24	0.014
10913	76.61	22.32	0.078	0.102	233	39	0.59	5	412	144	<100	51	99.78	45.32	0.013
10914	64.88	33.87	0.086	0.149	208	46	0.84	6	645	147	159	75	99.95	46.10	0.014
10915	97.15	2.25	0.035	0.066	421	18	0.39	3	232	109	<100	26	99.97	43.63	0.015
10916	96.84	2.40	0.041	0.082	433	18	0.48	4	322	108	277	31	99.96	43.81	0.020
10917	96.52	2.30	0.027	0.073	464	16	0.52	4	303	107	145	24	99.54	43.87	0.022
10918	93.91	1.14	0.249	0.627	364	56	3.43	18	3254	147	<100	366	99.77	41.91	0.027
10919	98.36	0.84	0.035	0.041	432	24	0.30	3	120	103	<100	19	99.64	43.60	0.018
10920	97.68	0.78	0.037	0.048	403	23	0.17	3	117	88	<100	28	98.79	43.14	0.020
10921	98.28	0.75	0.026	0.046	375	20	0.21	3	130	100	153	18	99.39	43.76	0.025
10922	98.66	0.76	0.027	0.043	368	22	0.22	2	117	102	<100	15	99.78	43.74	0.019
10923	97.99	0.75	0.023	0.049	355	20	0.43	5	127	103	<100	8	99.31	43.60	0.013
10924	98.66	0.82	0.021	0.048	390	20	0.35	3	127	112	<100	9	99.97	43.75	0.015
10925	80.96	17.20	0.078	0.154	252	38	0.84	6	617	105	255	69	99.36	44.60	0.025
10926°	98.54	1.15	0.024	0.032	470	16	0.14	3	78	150	<100	10	99.96	43.81	0.021
10927°	97.81	1.23	0.030	0.038	471	19	0.22	4	80	109	243	8	99.43	43.38	0.024
10928°	97.99	1.23	0.035	0.056	473	19	0.30	4	181	125	<100	20	99.69	43.80	0.011
10929°	98.50	1.00	0.028	0.052	486	17	0.31	4	174	130	<100	12	99.97	43.85	0.021
10930°	98.48	1.00	0.034	0.053	472	18	0.30	3	170	132	196	13	99.96	43.80	0.022
10931°	91.45	7.94	0.034	0.059	380	23	0.43	3	220	141	<100	22	99.99	44.02	0.014
10932°	83.08	15.60	0.074	0.104	241	34	0.80	4	465	169	207	43	99.76	44.44	0.018
10933°	84.73	14.14	0.070	0.100	237	32	0.81	3	461	163	<100	53	99.95	44.36	0.020

AG

° Sample not from MAIM Permit 9396020019 nor 9398100125.

APPENDIX 2: CONTINUED

Sample	%	%	%	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	%
	CaCO3	MgCO3	Fe2O3	Al2O3	SrCO3	MnO	SiO2	BaO	K2O	Na2O	P2O5	TiO2	Total	LOI	S
11326	97.27	1.49	0.029	0.038	368	28	0.18	3	114	100	164	9	99.08	43.71	0.008
11327	97.86	1.25	0.049	0.044	339	24	0.28	6	163	102	127	12	99.56	43.59	0.017
11328	94.89	4.30	0.042	0.035	299	31	0.14	9	133	102	721	8	99.54	43.86	0.017
11329	97.74	1.73	0.030	0.044	310	32	0.28	7	151	101	241	10	99.91	43.81	0.013
11330	98.13	1.18	0.045	0.054	339	28	0.34	8	211	134	<100	23	99.83	44.03	0.015
11331	97.29	0.93	0.068	0.043	355	22	0.32	8	177	116	163	20	98.74	43.90	0.016
11332	98.25	1.20	0.038	0.051	362	24	0.34	10	214	175	<100	33	99.96	43.61	0.019
11333	94.83	3.21	0.053	0.169	390	24	1.48	19	880	75	268	104	99.91	43.25	0.024
11334	98.10	1.17	0.023	0.063	436	18	0.47	8	275	46	153	30	99.92	43.56	0.024
11335	97.70	1.69	0.050	0.057	458	19	0.40	10	242	167	132	21	99.99	43.52	0.016
11336	96.87	2.49	0.039	0.069	548	21	0.38	7	271	103	<100	29	99.95	43.76	0.017
11337	87.26	11.80	0.085	0.099	458	31	0.53	11	473	125	135	61	99.90	44.11	0.021
11338	63.30	34.21	0.151	0.328	325	48	1.44	15	1784	121	278	185	99.72	45.29	0.025
11339	92.34	6.78	0.048	0.062	362	28	0.47	3	214	119	<100	27	99.78	44.00	0.023
11340	98.63	0.87	0.021	0.028	451	17	0.22	7	88	111	<100	6	99.83	43.67	0.020
11341	98.78	0.88	0.053	0.039	498	18	0.16	10	129	92	<100	25	99.99	43.63	0.015
11342	98.43	0.94	0.033	0.056	424	21	0.38	19	254	107	275	33	99.95	43.65	0.014
11343	97.84	1.25	0.022	0.064	458	22	0.43	3	259	87	180	22	99.71	43.82	0.026
11345	94.88	3.27	0.033	0.085	391	22	0.70	4	424	268	<100	39	99.08	43.62	0.031
14426	88.04	4.04	0.414	0.344	789	108	6.01	21	1877	161	537	212	99.22	40.93	0.038
14427	76.59	9.80	0.504	0.974	591	123	7.64	40	5764	175	414	706	96.28	39.96	0.025
14428	84.30	5.67	0.291	0.520	690	110	6.78	20	3213	163	394	347	98.06	40.84	0.041
14429	89.03	6.07	0.302	0.206	827	108	3.53	17	1107	102	373	133	99.40	42.62	0.033
14430	90.08	4.45	0.174	0.414	1263	90	3.67	15	2392	158	130	227	99.22	42.47	0.038
14431	96.97	1.32	0.103	0.112	631	86	1.30	5	453	126	391	75	99.99	43.32	0.026
14432	93.02	2.93	0.167	0.186	672	94	2.42	15	961	134	434	109	98.97	43.13	0.025
14433	74.63	11.60	0.432	1.090	622	121	8.26	33	6911	169	225	776	96.90	39.99	0.036
14434	86.78	6.77	0.327	0.381	715	106	5.11	17	2153	155	347	239	99.75	42.06	0.046
14435	96.97	2.26	0.087	0.056	330	28	0.41	8	215	108	163	38	99.88	44.24	0.020
14436	98.48	0.96	0.028	0.049	348	23	0.33	8	183	103	165	26	99.93	44.11	0.018
14437	97.89	0.77	0.070	0.028	356	21	0.13	8	81	110	268	16	98.98	44.02	0.016
14438	98.02	1.27	0.032	0.047	354	23	0.34	9	197	95	144	26	99.80	44.12	0.015
14439	95.85	1.85	0.139	0.222	519	55	1.66	20	1072	124	<100	111	99.90	43.38	0.035

APPENDIX 2: CONTINUED

Sample	% CaCO3	% MgCO3	% Fe2O3	% Al2O3	ppm SrCO3	ppm MnO	% SiO2	ppm BaO	ppm K2O	ppm Na2O	ppm P2O5	ppm TiO2	% Total	% LOI	% S
14440	82.82	12.61	0.388	0.374	449	101	2.65	17	1947	155	156	217	99.14	43.28	0.042
14441	81.28	9.28	0.353	0.708	707	107	5.95	22	4437	159	263	463	98.19	41.13	0.032
14442	78.19	9.02	0.364	0.517	650	107	8.46	26	2956	143	371	318	97.02	39.98	0.059
14443	67.02	15.94	0.589	1.122	464	147	8.38	33	6271	204	358	641	93.86	39.77	0.078
14444	96.22	2.38	0.125	0.097	392	25	0.86	11	442	112	193	57	99.80	43.74	0.022
14445	97.45	1.53	0.067	0.060	319	20	0.38	11	236	101	214	24	99.58	44.11	0.011
14446	96.38	2.21	0.103	0.071	385	23	0.71	10	278	115	136	34	99.56	44.00	0.026
14447	83.74	13.90	0.120	0.117	301	29	0.96	17	549	121	382	81	99.00	44.65	0.019
14448	92.31	5.05	0.042	0.063	366	29	1.29	8	259	139	358	54	98.87	43.57	0.034
14449	64.58	18.30	0.547	1.409	436	136	9.87	49	8151	293	183	937	95.72	38.40	0.166
15501	80.47	14.48	0.337	0.309	387	111	2.89	14	1730	144	<100	177	98.74	43.20	0.025
15502	96.30	1.81	0.093	0.136	480	36	0.92	14	631	146	184	86	99.42	43.84	0.022
15503	98.17	0.98	0.031	0.047	462	25	0.24	9	166	112	100	25	99.55	44.04	0.020
15505	97.97	0.97	0.065	0.112	447	37	0.67	15	328	115	159	57	99.90	44.09	0.025
15506	95.64	3.40	0.080	0.093	393	20	0.63	9	395	179	208	47	99.97	43.89	0.022
15507	96.60	2.56	0.055	0.093	366	21	0.55	11	299	163	111	62	99.96	44.03	0.017
15508	92.97	1.63	0.289	0.507	368	46	3.40	45	1262	337	236	309	99.06	42.18	0.018
15509	97.44	1.12	0.051	0.091	349	20	0.92	10	256	190	152	69	99.73	43.59	0.023
15510	90.89	7.53	0.153	0.113	328	26	0.92	15	433	189	174	65	99.73	44.19	0.017
15511	75.20	23.89	0.115	0.089	202	42	0.56	17	338	136	266	42	99.96	45.91	0.017
15512	88.13	10.53	0.117	0.072	246	33	0.59	12	300	138	104	42	99.53	44.84	0.011
15513	98.18	1.16	0.131	0.038	331	22	0.36	10	131	128	177	24	99.94	43.86	0.011
15514	81.69	16.07	0.108	0.095	289	27	0.70	12	464	129	256	60	98.79	44.71	0.020
15515	73.38	24.74	0.094	0.093	242	35	0.71	10	411	129	177	48	99.12	45.48	0.009
15516	87.95	9.96	0.067	0.085	347	26	0.84	9	329	138	213	49	99.02	44.57	0.019
15517	77.63	20.29	0.135	0.141	262	31	1.14	13	708	167	259	77	99.49	45.20	0.017
15518	87.74	9.30	0.149	0.117	315	25	0.95	17	483	136	253	70	98.39	44.52	0.023
15519	90.91	6.35	0.036	0.065	353	24	1.18	3	274	233	571	31	98.69	43.96	0.029
15520	83.71	11.80	0.047	0.080	301	26	2.99	8	364	157	441	51	98.76	43.47	0.022
15521	62.05	33.20	0.239	0.200	218	40	2.16	12	1042	148	317	139	98.04	45.48	0.020
15522	57.20	39.63	0.103	0.211	159	41	2.06	11	1060	141	742	113	99.42	46.02	0.017
15523	57.68	40.02	0.137	0.132	158	39	1.27	12	627	132	341	77	99.37	46.35	0.018
15524	76.58	20.18	0.138	0.159	306	33	1.77	14	816	131	389	76	99.00	44.29	0.030

APPENDIX 2: CONTINUED

Sample	% CaCO3	% MgCO3	% Fe2O3	% Al2O3	ppm SrCO3	ppm MnO	% SiO2	ppm BaO	ppm K2O	ppm Na2O	ppm P2O5	ppm TiO2	% Total	% LOI	% S
15551	98.32	0.81	0.028	0.072	363	27	0.27	7	97	113	193	26	99.58	43.90	0.014
15553	89.59	9.35	0.156	0.070	292	34	0.61	9	263	171	<100	44	99.85	44.64	0.011
15554	73.34	24.13	0.076	0.163	291	34	1.10	11	760	139	280	92	98.97	45.44	0.020
15555	94.53	4.24	0.054	0.078	381	21	0.81	16	300	155	<100	32	99.79	43.95	0.022
15556	65.46	32.93	0.129	0.133	175	46	0.91	10	610	145	179	79	99.69	46.04	0.013
15557	70.02	28.85	0.153	0.097	269	50	0.64	15	391	111	257	80	99.88	45.86	0.020
15558	87.05	11.45	0.064	0.086	294	35	0.70	10	347	134	<100	51	99.43	44.71	0.019
15559	97.47	1.87	0.031	0.060	374	24	0.39	11	222	113	147	34	99.92	43.87	0.026
15560	96.13	1.67	0.144	0.084	666	107	1.26	8	315	113	742	36	99.49	43.43	0.024
15561	86.03	13.10	0.061	0.075	294	45	0.55	8	310	136	139	35	99.91	44.30	0.014
15562	91.96	6.36	0.045	0.073	397	21	0.95	6	312	153	153	26	99.50	43.90	0.023
15563	84.47	14.30	0.076	0.125	291	27	0.83	11	593	153	120	70	99.93	44.24	0.017
15564	60.51	37.56	0.080	0.135	204	50	1.03	10	614	154	<100	74	99.42	45.81	0.040
15565	64.57	32.01	0.382	0.400	327	43	1.79	13	2334	217	237	248	99.50	45.04	0.058
15566	72.50	25.88	0.119	0.176	255	43	1.12	6	898	168	118	119	99.95	45.00	0.025
15567	81.15	15.75	0.093	0.224	353	33	2.35	12	1197	130	118	127	99.76	43.70	0.028
15568	90.95	5.28	0.135	0.148	585	106	1.68	9	782	133	410	77	98.40	43.40	0.025
15569	95.55	3.44	0.046	0.074	385	36	0.70	3	276	114	<100	33	99.89	43.70	0.013
15570	97.46	1.77	0.032	0.067	367	28	0.48	10	233	115	<100	26	99.88	43.62	0.016
15571	95.57	3.41	0.055	0.095	342	33	0.54	15	1273	154	426	62	99.90	44.15	0.027
15572	96.63	1.53	0.064	0.057	492	29	0.29	10	280	134	112	33	98.68	43.98	0.030
15573	91.20	5.36	0.221	0.229	370	65	1.94	14	1059	101	<100	130	99.14	43.38	0.023
15574	95.23	2.11	0.044	0.063	375	31	0.48	10	255	123	122	25	98.02	43.97	0.014
15575	97.60	1.35	0.079	0.062	439	33	0.40	9	207	127	150	36	99.60	44.09	0.022
15576	98.22	1.32	0.079	0.047	338	29	0.24	9	151	96	231	23	99.99	44.24	0.017
15577	95.99	3.47	0.082	0.046	318	29	0.30	12	156	116	108	19	99.97	44.19	0.010
15578	97.93	1.58	0.029	0.045	338	26	0.30	9	149	104	140	14	99.96	44.17	0.013
15579	96.18	1.38	0.031	0.055	345	29	0.32	3	223	112	266	45	98.07	44.08	0.021
15580	97.39	0.98	0.023	0.042	354	37	0.22	2	137	122	209	28	98.74	43.92	0.018
15581	97.86	1.58	0.031	0.057	336	29	0.31	7	233	112	102	20	99.92	43.98	0.015
15582	96.58	2.08	0.065	0.077	378	23	0.59	12	285	126	184	48	99.50	43.89	0.017
15583	97.28	1.60	0.091	0.059	347	34	0.31	15	224	155	140	27	99.43	44.15	0.017
15584	97.63	1.26	0.059	0.041	350	27	0.18	8	133	137	914	33	99.32	43.88	0.009

**APPENDIX 2: CONTINUED**

Sample	%	%	%	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	%
	CaCO3	MgCO3	Fe2O3	Al2O3	SrCO3	MnO	SiO2	BaO	K2O	Na2O	P2O5	TiO2	Total	LOI	S
15585	98.70	0.83	0.100	0.056	371	26	0.20	11	191	117	125	44	99.97	43.94	0.017
15586	98.66	0.91	0.099	0.039	381	22	0.15	8	130	112	157	25	99.95	43.94	0.012
15587	98.73	0.83	0.067	0.037	404	23	0.17	10	110	103	140	11	99.91	44.01	0.018
15588	96.12	1.67	0.053	0.061	361	29	0.41	8	210	138	106	35	98.40	44.07	0.017
15589	78.43	19.64	0.193	0.100	224	49	0.70	16	403	174	211	56	99.18	45.21	0.014
15590	92.35	4.72	0.178	0.268	477	43	1.51	25	1332	171	149	145	99.26	43.68	0.023
15591	85.64	2.38	0.286	0.250	454	98	9.85	13	1285	128	404	160	98.67	39.30	0.024
15592	96.35	1.08	0.165	0.093	364	34	2.10	15	395	97	176	61	99.90	42.88	0.019
15593	98.18	0.97	0.037	0.056	350	27	0.61	10	222	144	<100	21	99.92	43.60	0.018
15594	98.42	1.09	0.055	0.032	453	25	0.24	9	129	117	<100	13	99.91	44.07	0.020
15595	91.00	6.76	0.085	0.072	376	25	0.52	7	285	140	264	41	98.56	44.33	0.020
15596	96.40	2.87	0.031	0.056	354	31	0.36	4	272	107	410	32	99.84	44.07	0.018
15597	96.98	1.92	0.040	0.089	395	33	0.66	14	1142	131	637	36	99.92	43.90	0.059
15598	98.39	0.99	0.091	0.042	392	27	0.29	10	263	109	199	28	99.90	44.01	0.019
15599	92.86	5.52	0.107	0.080	424	26	0.64	9	360	128	171	40	99.32	44.15	0.029



### APPENDIX 3: DESCRIPTIONS OF THE 2001 SAMPLES FROM CORKSCREW, IDLEWILDE, LIMESTONE AND MARBLE MOUNTAINS

Note: Samples are listed in order from stratigraphic top to bottom. Most samples consist of chips at ½-m intervals. Coordinates are UTM NAD83.

Sample	Formation	Strat. Thick. (m)	Description
<b><u>CORKSCREW MOUNTAIN</u></b> (MAIM Permit 9396020019)			
<b><u>CS2001-01: Area A0</u></b>			
15258	Rundle	2/3	<u>Dolomite</u> , brown weathered, tan fresh, very fine grained, massive
-	Rundle	~12	covered
15259	Rundle	2¾	<u>Dolomitic Mudstone</u> , medium-grey weathered, dark-grey fresh, vuggy with brownish-buff material on vugs, beds 5 to 25 cm, attitude of beds 168°/34°W
-	Rundle	~32¾	covered
15260	Rundle	2	<u>Wackestone</u> , brownish-grey weathered, medium-grey fresh, beds 10 to 30 cm, attitude of beds 168°/26°W
15263	Rundle	1	<u>Lime Mudstone</u> , medium-grey weathered, very dark grey to black fresh, vuggy with some buff material on vugs (dolomitic), massive
-	Rundle	1½	covered
15262	Rundle	1	<u>Lime Mudstone to Wackestone</u> , medium-grey weathered, medium- to dark-grey fresh, "frost" heave (partly displaced) about 15m vertical from creek bed
-	Rundle	4½	covered
15261	Rundle	1	<u>Wackestone</u> , medium-grey weathered and fresh, some grains to 2mm, beds to 10 cm, attitude of beds 168°/26°W
<b><u>CS2001-02: Area A0</u></b>			
15257	Rundle	2¼	<u>Lime Mudstone</u> , medium-grey weathered, dark-grey fresh, beds 5 to 40 cm, some weathered surfaces exhibit well-developed laminations, few oolites to 3 mm on weathered surface, attitude of beds 90°/18°N
-	Rundle	~13¾	covered
15256	Rundle	¾	<u>Lime Mudstone</u> , massive, medium-grey weathered and fresh, vuggy with brownish-buff material lining vugs and fractures, possibly float
-	Rundle	~3½	covered
15255	Rundle	~3	<u>Grainstone to Wackestone</u> , partly covered, crumbly, medium-grey weathered, light-grey grainstone grading upward into dark-grey wackestone, buff material on fractures and between grains
15254	Rundle	2½	<u>Wackestone</u> , medium-grey weathered and fresh, massive
15253	Rundle	2½	<u>Crinoidal Wackestone</u> , light-grey weathered, medium-grey fresh, grains to 4 mm, massive
15252	Rundle	2¼	<u>Crinoidal Grainstone</u> , light-grey weathered and fresh, grains to 3 mm, beds 10 cm to 1m thick, few interbeds very coarse grained, few beds crumbly, attitude of bedding 064°/17°NW
15251	Rundle	2¾	<u>Crinoidal Grainstone</u> , light-grey weathered and fresh, grains to 3mm, beds 1m to massive, near Banff (contact not observed)
<b><u>CS2001-03: Area A0</u></b>			
10904	Rundle	2	<u>Crinoidal Grainstone</u> , as 10903, top eroded
10903	Rundle	2	<u>Crinoidal Grainstone</u> , light-grey, coarse-grained, beds 30 cm to 1m, attitude of beds 164°/25°SW

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>CS2001-04: Area A1</b>			
10907	Rundle	2	<u>Grainstone</u> , brownish-grey weathered, light-brownish-grey fresh, beds 2 to 20 cm, attitude of beds 128°/40°SW
-	Rundle	9½	covered
10905	Rundle	2	<u>Crinoidal Grainstone</u> , very light grey, coarse-grained, attitude of beds 154°/34°SW
10906	Rundle	3	<u>Crinoidal Grainstone</u> , very light grey, coarse-grained, massive
<b>CS2001-05: Area A1</b>			
10949	Rundle	2	<u>Wackestone</u> , as per 10949 but with rare buff-colored interbeds to 2 cm, few brachiopods and bivalves to 3 cm, attitude of beds 167°/22°W
10948	Rundle	1½	<u>Wackestone</u> , medium- to dark-grey weathered, light-brownish-grey to light-grey fresh, grains to 3 mm, beds to ½ m, few interbeds of crumbly grainstone, attitude of beds 145°/21°SW
-	Rundle	7¼	covered
10950	Rundle	¾	<u>Lime Mudstone to Wackestone</u> , brownish weathered, medium-grey fresh, some grains to 2 mm, poor exposure
<b>CS2001-06: Area A1</b>			
15595	Rundle	8	<u>Packstone</u> , light-grey to light-brownish-grey, fine- to medium-grained, locally coarse-grained, matrix supported
-	Rundle	9¾	covered
15594	Rundle	½	<u>Grainstone</u> , light-grey, medium- to coarse-grained, grain supported, grains to 2½ mm, partially vuggy, fetid
<b>CS2001-07: Area A1</b>			
15592	Rundle	2	<u>Packstone</u> , light-grey, grain supported, medium- to coarse-grained
15593	Rundle	6½	<u>Crinoidal Packstone</u> , medium- to coarse-grained, appears grain supported, grains to 3 mm, attitude of beds 142°/17°SW
-	Banff	22¾	covered
15591	Banff	¾	<u>Mudstone</u> , attitude of beds 0°/20°W
<b>CS2001-08: Area A1</b>			
-	Rundle	3	not sampled (inaccessible part of cliff)
15596	Rundle	2	<u>Grainstone</u> , light-grey, medium to coarse-grained
15597	Rundle	1¼	<u>Wackestone</u> , light-grey to brown; fine- to medium-grained; fractured, broken and vuggy; sandy texture on weathered surface
15598	Rundle	¾	<u>Crinoidal Packstone</u> , light-grey, massive, grains to 2½ mm
<b>CS2001-9: Area A1</b>			
-	-	-	<u>Dolomite and Dolomitic Mudstone</u> , interbedded, beds to ½ m thick
10947	Banff (?)	1¼	<u>Grainstone</u> , light-grey weathered, very light grey fresh, scattered outcrops
<b>CS2001-10: Area A1</b>			
11332	Rundle	1½	<u>Grainstone to Packstone</u> , medium-grey weathered, purplish-brown to medium-grey fresh, few packstone intervals, some orange-brown stain

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>CS2001-11: Area A1</b>			
11331	Rundle	8¾	<u>Grainstone</u> , dark- to medium-tan-grey fresh, purple tinge on weathered surface, massive, few intervals of <u>Packestone</u> , grains 1½ to 4 mm, crinoid oscicles, attitude of beds 140° to 160°/30°SW
<b>CS2001-12: Area A2</b>			
10523	Rundle	2	<u>Grainstone</u> , light-brownish-grey, coarse-grained, massive
10522	Rundle	2	<u>Grainstone</u> , light-grey, coarse-grained, beds ½ to 1 m, base covered
<b>CS2001-13: Area A2</b>			
10524	Rundle	3½	<u>Grainstone</u> , light-grey, coarse-grained, crinoids, beds 30 to 50 cm, attitude of beds 155°/27°SW
10525	Rundle	1¾	<u>Grainstone</u> , as per 10524, crinoids
-	Rundle	1¼	not sampled (inaccessible part of cliff)
10902	Rundle	3	<u>Grainstone</u> , as per 10901
10901	Rundle	1¾	<u>Grainstone</u> , light-grey, coarse-grained, crinoids, massive, attitude of beds 138°/27°SW, base covered
<b>CS2001-14: Area A2</b>			
11330	Rundle	~7	<u>Grainstone</u> , medium- to light-grey weathered, light- and dark-grey fresh, coarse- and fine-grained interbeds, orange-brown stain, attitude of beds 130°/25°SW
11329	Rundle	¾	<u>Mudstone</u> , light- to medium-grey weathered, light-grey fresh
11328	Rundle	1½	<u>Grainstone</u> , medium- to light-grey weathered, light-grey with pink tinge fresh, coarse-grained at base, fines up, some secondary calcite, attitude of beds 130°/28°SW
-	Banff	4¼	covered
15590	Banff	½	<u>Mudstone</u> , grey weathered, dark-grey fresh, cryptocrystalline
<b>CS2001-15: Area A2</b>			
15589	Rundle	¾	<u>Wackestone</u> , light-brown to brownish-grey, fine-grained with some medium- to coarse-grained material, euhedral grains, vuggy
15588	Rundle	4½	<u>Grainstone</u> , light-grey, grains to 2 mm
<b>CS2001-16: Area A2</b>			
15581	Rundle	7	<u>Grainstone</u> , medium-grey weathered, light-pinkish-tan-grey fresh, grains ½ to 5 mm, beds 1 cm to ½ m, fetid odour, numerous small vugs, few shell fragments, attitude of beds 122°/19°SW and 125°/28°SW
<b>CS2001-17: Area A3</b>			
14448	Rundle	1	<u>Grainstone</u> , dark-grey weathered, dark-purplish-grey fresh, fine-grained with some grains to 1½ mm, pinhole vugs, orange-brown stain on vugs
14447	Rundle	½	<u>Mudstone</u> , tan-buff weathered, dark-grey with light-brownish-grey fresh, microcrystic, few grains to 1 mm
-	Rundle	2	covered
14446	Rundle	2	<u>Grainstone to Packestone</u> , lower 30 cm as 14445, dark-grey fresh, medium-grained
14445	Rundle	7	<u>Packestone</u> , crumbly and porous, medium-grey weathered, light-grey with pinkish-brown tinge fresh, most grains to 3 mm, but some up to 1 cm, beds ½ to 1 m, corals, attitude of beds 108°/6°SW
-	Rundle	1¼	covered

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>CS2001-17 CONT.</b>			
14444	Rundle	1	<u>Grainstone</u> , medium-grey weathered, light-pinkish-tan-grey fresh, grains to 1 cm, beds 20 to 80 cm, some orange-brown stain on joints, attitude of beds 124°/21°SW
-	Rundle	½	covered
15582	Rundle	1½	<u>Packstone</u> , light-grey to light-brownish-grey, fine- to medium- to locally coarse-grained
<b>CS2001-18: North Slope of Area 3</b>			
15583	Rundle	4	<u>Grainstone</u> , light-grey, medium- to coarse-grained, some grains to 5 mm, attitude of beds 131°/24°SW
15584	Rundle	2	<u>Wackestone</u> , light-grey, coarse- to fine-grained, some vugs
15585	Rundle	2	<u>Grainstone</u> , light-grey, fine- to locally coarse-grained, some vuggy
15586	Rundle	1¼	<u>Grainstone</u> , light-grey, fine- to coarse-grained
-	Rundle	½	covered
15587	Rundle	¾	<u>Grainstone</u> , light-grey, fine- to medium-grained, some coarse grained material, matrix supported
-	Rundle	½	not sampled at Banff Contact
<b>CS2001-19: Area A3</b>			
11327	Rundle	8	<u>Grainstone to Packstone</u> , as 11326, more uniform grains average 2 mm in size, massive, attitude of beds 119°/38°SW
-	Rundle	½	covered
11326	Rundle	3½	<u>Grainstone</u> , medium-pinkish-grey fresh, interbedded coarse- and medium-grained, orange-brown stain, beds to 1 m, attitude of beds 136°/24°SW
-	Banff	6¼	covered
14449	Banff	2	<u>Mudstone</u> , dark-grey fresh, thick-bedded with thin laminated layers, attitude of beds 122°/30°SW
<b>CS2001-20: Area A3</b>			
15567	Rundle	1½	<u>Grainstone</u> , medium- to coarse-grained
<b>CS2001-21: Area A3</b>			
15562	Rundle	2½	<u>Crinoidal Packstone</u> , grey to light-brown with brown staining locally, medium- to coarse-grained, crinoid oscicles to 5 mm
15563	Rundle	5	<u>Grainstone</u> , light-grey, fine- to coarse-grained, partly micritic
15564	Rundle	2½	<u>Wackestone</u> , very light brown to brownish-grey, fine-grained with rare grains to 1 mm, massive, sandy texture, weakly crinoidal, few calcite veins 1 to 2 mm
15565	Rundle	1¾	<u>Wackestone</u> , recessive, some rust-colored zones (argillaceous ?), vuggy sections to several cm's, buff weathered, broken, 5 to 10 per cent fragments within very fine grained matrix
15566	Rundle	2½	<u>Wackestone</u> , light-brown to light-brownish-grey, fine- to medium-grained, in part micritic, few coarse-grained intervals, attitude of beds 122°/25°SW

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>CS2001-22: Area A3</b>			
15599	Rundle	1½	<u>Limestone</u>
-	Rundle	~2	covered
15554	Rundle	3	<u>Packstone</u> , light- to dark-brown, fine- to medium-grained, lower ½ m with sandy texture (dolomitic), prominent joint at 050°/75°N
15555	Rundle	4½	<u>Crinoidal Grainstone</u> , in part mud supported, with grains up to 2mm
15556	Rundle	2	<u>Packstone</u> , light-grey, fine-grained, few coarse-grained fragments, attitude of beds 125°/29°SW
-	Rundle	2	covered
15557	Rundle	1	<u>Dolomitic Limestone</u> , partly recessive, light-brown, fine-grained, few grains to 1 mm grains, vugs to 1 cm, some rust stain
15558	Rundle	3½	<u>Packstone</u> , light-brown, fine- to coarse-grained, few grains to 2½ mm, corals and abundant crinoids
15559	Rundle	3	<u>Packstone</u> , light-grey to brownish-grey, medium- to coarse-grained, abundant corals
-	Rundle	3	as above: inaccessible part of cliff
-	Rundle	~2	covered
15551	Rundle	½	<u>Wackestone</u> : attitude of beds 123°/52°SW
15552	Rundle	2	<u>Limestone</u> : dolomitic(?), sample lost
-	Rundle	~2¼	covered
15553	Rundle	1¼	<u>Packstone</u> : light- to light-brownish-grey, grains to 4 mm in fine-grained matrix, in part vuggy, abundant bryozoans & corals
<b>CS2001-23: Area A3</b>			
15561	Banff	2½	<u>Packstone</u> , light-brownish-grey to buff, fine-grained matrix, attitude of beds 110°/20°SW
-	Banff	4¼	covered
-	Banff	~1	<u>Mudstone</u> , attitude of beds 134°/26°SW
-	Banff	11¼	covered
15568	Banff	3	<u>Grainstone</u> , attitude of beds 120°/27°SW
<b>CS2001-24: Area A3</b>			
14438	Rundle	1¾	<u>Grainstone</u> , medium-grey weathered, light-grey with purple tinge fresh, coarse- to fine-grained, beds to ½ m, attitude of beds 138°/28°SW, orange-brown stain on pinhole vugs
15575	Rundle	(grab)	<u>Packstone</u> , light-brownish-grey, fine- to locally coarse-grained, crinoidal, within same interval as 14438
15576	Rundle	(1½)	<u>Grainstone</u> , medium- to coarse-grained, within same interval as 14438
-	Rundle	2½	covered
15574	Rundle	1	<u>Grainstone</u> , attitude of beds 130°/32°SW
-	Rundle	¾	covered
14437	Rundle	grab	<u>Grainstone</u> , medium-grey weathered, light-pinkish-grey fresh, grains to 1½ mm in size, moderately sorted
-	Rundle	~2¼	covered
14440	Banff	2½	<u>Wackestone</u> , light-grey weathered, black fresh, interbedded with <u>Packstone</u> , basal 10 cm is <u>Grainstone</u> , possible attitude of beds 128°/34°SW
14439	Banff	1½	<u>Mudstone</u> , tan-light-grey weathered, very dark grey fresh, red- and orange-stain, beds to 20 cm with fine laminated interbeds of mudstone, vugs to 1 cm, attitude of beds 122°/23°SW

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>CS2001-24 CONT.</b>			
-	Banff	(?)	covered
-	Banff	(?)	<u>Dolomitic Mudstone</u> , tan- to light-grey, fine-grained, microcrystalline
<b>CS2001-25: Area A4</b>			
15577	Rundle	4	<u>Packstone</u> , light-brownish-grey, fine- to locally coarse-grained
15578	Rundle	4½	<u>Packstone</u> , light-grey to brownish grey, medium- to coarse-grained, crinoidal
15579	Rundle	2¼	<u>Packstone</u> , as above
15580	Rundle	3	<u>Grainstone</u> , light-grey, coarse-grained, crinoidal, basal 40 cm is very fine grained
-	Banff	~19¼	covered
15560	Banff	1½	<u>Wackestone</u> , fetid odour
<b>CS2001-26: Area A3</b>			
14435	Rundle	3¾	<u>Grainstone</u> , light-grey weathered, light-pinkish-grey fresh, with some brown stain, poorly sorted, grains 1 to 5 mm, possible attitude of beds 125°/25°SW
-	Rundle	1¾	covered
14436	Rundle	3½	<u>Grainstone</u> , medium-grey weathered, light-pinkish-grey fresh, brown stain on fractures, medium- to coarse-grained, crinoid oscicles and shell fragments, beds 20 to 60 cm, possible attitude of beds 133°/30°SW
-	Rundle	5½	covered
15572	Rundle	½	<u>Packstone</u> , medium- to coarse-grained, light-brownish-grey, prominent fracture 045°/88°SE
-	Banff	2¼	covered
15573	Banff	grab	<u>Mudstone</u> , very fine to microcrystalline, micritic, dark-brownish-grey, partly vuggy, some buff stain in vugs, abundant 'healed' fractures, grab sample taken 4 m west of sample 14436; bedding oriented 136° 29SW.
<b>CS2001-27: Area 3</b>			
15524	Rundle	~3	<u>Grainstone to Packstone</u> , tan-medium-grey weathered, medium-grey fresh, coarse-grained, bryozoan shell fragments, coral, crinoid oscicles, 1 cm diameter vugs, some calcite filled
15521	Rundle	2	<u>Wackestone to Mudstone</u> , tan-light-grey weathered, tan-medium-grey fresh, corals, crinoid oscicles, and bivalves, pinhole vugs (few up to 5 cm diameter), some calcite filled, hydrocarbon odour, possibly overlap with 15524
15520	Rundle	1¼	<u>Grainstone</u> , medium-grey weathered, tan to light-grey fresh, some orange-brown and dull-red stain, medium-grained, fining upward, shell fragments and crinoid oscicles
15522	Rundle	1	<u>Dolomitic Mudstone</u> , mostly covered, tan-grey, pinhole vugs
15519	Rundle	1¼	<u>Grainstone</u> , dark-grey weathered, medium-grey with light-tan tinge fresh, medium grained, shell fragments, bryozoans, colonial and solitary corals, crinoid stems, and oscicles visible, grades upward into packstone and wackestone, orangish-brown stained, s
-	Rundle	¾	covered
15523	Rundle	½	<u>Dolomitic-Mudstone</u> , tan fresh, pinhole vugs; grab sample
-	Rundle	½	covered
15518	Rundle	¾	<u>Grainstone-Packstone</u> , medium-grey weathered, medium-grey with light-brown tinge fresh, coarse grained 2-5mm, crinoid stems and oscicles, some secondary calcite veins, some secondary travertine on surface

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>CS2001-27 CONT.</b>			
15515	Rundle	~¼	<u>Mudstone</u> , grab sample, tan weathered, pinkish-grey fresh
15517	Rundle	1	<u>Mudstone</u> , dark-grey and tan weathered, pinkish-brown-grey fresh, highly fractured, recessively weathered, microcrystic, bedding oriented 130°/18°SW
15516	Rundle	2	<u>Grainstone</u> , medium-grey with white splotches weathered, medium-brownish-grey fresh, some orangish-brown stain, grains to 2 mm, thin calcite veinlets, massive
15514	Rundle	3	<u>Grainstone</u> , medium-grey fresh, lower 40 cm is <u>Mudstone</u> grading upward to <u>Wackestone</u> , pinhole vugs, poorly sorted with crinoid oscicles, coral, and shell fragments, massive, attitude of beds 122°/22°SW, probably a repeat of samples 15516-17
-	Rundle	4¾	covered
15513	Rundle	1½	<u>Grainstone</u> , light-grey weathered, medium-brownish-grey fresh, medium- to fine-grained
15512	Rundle	1¾	<u>Packstone to Grainstone</u> , medium- to light-grey weathered, light-brownish-grey fresh, fine-grained matrix, beds 10 to 20 cm, attitude of beds 230°/18°NW
15511	Rundle	1½	<u>Wackestone to Packstone</u> , medium-grey weathered, brownish-grey fresh, grains to 1 mm, microcrystalline matrix, massive, few vugs to 2 cm, fetid odour, secondary travertine growth on outcrop
-	Rundle	16¼	covered
15505	Rundle	4½	<u>Packstone</u> , light brownish-grey, vuggy, fetid odour, crinoidal
-	Rundle	¼	covered
15504	Rundle	~½	<u>Grainstone</u> , as 15503, but weathering is more buff-white, grab sample (not analyzed)
15503	Rundle	~1½	<u>Grainstone</u> , as 15502, but slightly coarser grained
-	Rundle	~¼	covered
15502	Rundle	~½	<u>Grainstone</u> , light-brownish-grey, medium- to coarse-grained, vuggy, fetid, crinoidal
-	Rundle	~16½	covered
15501	Banff	1¼	<u>Grainstone</u> , brownish-grey weathered and fresh, blocky, partly argillaceous
<b>CS2001-28: Area A3</b>			
15510	Rundle	1½	<u>Grainstone</u> , tan weathered, purplish-medium-grey fresh, grains to 2 mm, beds to 50 cm, vugs up to 5 cm across, fetid odour, attitude of beds 122°/14°SW
15509	Rundle	1	<u>Grainstone</u> , as per 15507, weakly laminated, attitude of beds 122°/24°SW
15508	Rundle	<¼	<u>Grainstone</u> , tan weathered, white fresh, crumbly, occurs as a stringer, intact crinoid stems and oscicles, well sorted, attitude of beds 140°/14°SW
15507	Rundle	1	<u>Grainstone</u> : whitish-tan weathered, medium-purplish-grey fresh, better sorted than 15506, grains to 2 mm, pinhole vugs up to 1 mm, stringer of recessive grainstone at top, basal 30 cm overlaps with 15506
15506	Rundle	1	<u>Grainstone</u> , dark-grey weathered, medium-purplish-grey fresh, grains 1 to 3 mm, massive, crinoid oscicles, fetid odour

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>CS2001-29: Area A4</b>			
15569	Rundle	3½	<u>Packstone</u> , light-brownish-grey, fine- to coarse-grained, attitudes of beds 110°/21°SW, 124°/16°SW
15570	Rundle	2½	<u>Packstone</u> , light-grey, medium- to coarse-grained, abundant crinoids
15571	Rundle	3½	<u>Packstone</u> , as 15570 but slightly darker to brownish-grey, more massive
-	Banff	~3½	covered
14443	Banff	2	<u>Mudstone</u> , medium-grey weathered, dark-grey fresh, hydrocarbon odour, beds 1 to 20 cm, attitude of beds 128°/20°SW
14430	Banff	~½	<u>Mudstone</u> , medium-grey weathered, medium- to dark-grey fresh, crystals are non-planar to anhedral, grab sample
14429	Banff	¼	<u>Grainstone</u> , tan and medium-grey weathered, light- and medium-grey fresh, very fine grained, faint hydrocarbon smell, grab sample
14428	Banff	1	<u>Mudstone</u> , medium-grey weathered, dark-grey fresh, calcite veinlets oblique and parallel to bedding, lower 10 cm is medium-grained <u>Grainstone</u>
14427	Banff	½	<u>Mudstone</u> , tan weathered, dark-grey fresh, microcrystic, calcite blebs and veinlets
14426	Banff	¾	<u>Wackestone to Grainstone</u> , medium-grey weathered, dark-grey fresh wackestone interbedded with light-grey fresh, coarse-grained grainstone with pinhole vugs, beds 5 to 20 cm, calcite veinlets, attitudes of beds 167°/22°W, 176°/18°W
14442	Banff	1	<u>Wackestone-Packstone</u> , light-grey weathered, light-grey-brown fresh, grains to 2½ mm, beds 5 to 10 cm, upper 20 cm is <u>Mudstone</u>
14441	Banff	¾	<u>Mudstone</u> , medium-grey weathered, grey-dark-brown fresh, hydrocarbon odour, beds 1 to 10 cm, attitude of beds 130°/22°SW
14434	Banff	1	<u>Grainstone</u> , as 14431, grains ~1½ mm, rounded, few crinoids, fresh surface is more black upsection
14433	Banff	¾	<u>Mudstone</u> , light- to medium-grey weathered, dull brownish-dark-grey fresh, grades upwards into <u>Wackestone</u> , beds 2 to 5 cm, hydrocarbon odour
14432	Banff	1¾	<u>Grainstone</u> , as 14431, but coarser grained, crinoid oscicles to 2½ mm, upper 10 cm is <u>Wackestone</u> , beds to 10 cm, sharp contact with unit above, attitude of beds 135°/19°SW
14431	Banff	2¼	<u>Grainstone</u> , light to medium-grey weathered, light-brownish-medium-grey fresh, medium-grained, sugary texture, crystals are non-planar-anhedral, calcite veinlets and some calcite filled vugs to 2 mm



## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>CS2001-30 Oradea Ridge along Forestry Trunk Road 734</b>			
10968	Rundle	3½	<u>Wackestone to Grainstone</u> , medium-grey, grains to 3 mm in darker-grey mud matrix, beds 15 - 50 cm thick, very hard
10967	Rundle	3	<u>Wackestone and Grainstone</u> , as 10966 with more medium- to dark-grey wackestone than grainstone
10966	Rundle	2½	<u>Grainstone and Wackestone</u> , light-grey, coarse-grained grainstone with medium to dark-grey wackestone interbeds, very hard, beds ½ to 1 m thick
10965	Rundle	2	<u>Mudstone to Wackestone</u> , medium-grey, beds ¼ - ½ m thick, very hard
-	Rundle	3½	covered
-	Rundle	1½	<u>Dolomite or Dolomitic Limestone</u> , brown-weathered, medium-brownish-grey fresh surface (not sampled)
-	Rundle	5	covered
10964	Rundle	5	<u>Grainstone</u> , light- to medium-grey, coarse-grained, massive
10963	Rundle	3¾	<u>Grainstone</u> , light-grey, beds 40 cm to 1 m, attitude of beds 152°/45°SW
10962	Rundle	2½	<u>Mudstone to Wackestone</u> , medium-grey, massive to thick-bedded

**IDLEWILDE MOUNTAIN** (MAIM Permit 9396020019)**ID2001-01: At South End of North Peak**

10521	Rundle(?)	10	<u>Dolomite</u> , very light grey, coarse-grained, vuggy, massive, chert nodules up to 10 cm diameter
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**ID2001-02: West Slope of Ridge Crest**

10520	Banff	3	<u>Mudstone</u> , laminated, beds 10 to 40 cm
-	Banff	10	<u>Dolomite and Lime Mudstone</u> , interbedded

**ID2001-03: Along Ridge Crest on West Flank**

10519	Rundle	3	<u>Dolomite</u> , tan-grey, mostly massive, micritic, laminae visible on weathered surface, vuggy
10518	Rundle	2¾	<u>Lime Mudstone</u> , micritic, beds 30 to 60 cm thick; lower 60 cm is <u>Grainstone</u> , light-brownish-grey, coarse-grained
10517	Rundle	1¾	<u>Grainstone</u> , tan-brown-grey, crumbly, yellow stain on fractures
10516	Rundle	2½	<u>Grainstone</u> , as per 10515
10515	Rundle	2	<u>Grainstone</u> , light-grey, beds to ½ m

**ID2001-04: South Peak**

10510	Rundle	1¼	<u>Lime Mudstone to Wackestone</u> , light-grey, brown material on fractures, beds to 10 cm
10511	Rundle	2¼	<u>Crinoidal Grainstone</u> , light-grey, coarse-grained, brownish material along fractures, beds 15 to 30 cm
10512	Rundle	2½	<u>Wackestone</u> , light-grey, coarse-grained, beds 30 to 50 cm, attitude of beds 161°/24°NE
10513	Rundle	3¼	<u>Crinoidal Grainstone</u> , light-grey, crumbly, massive
10514	Rundle	2	<u>Lime Mudstone</u> , dark-grey fresh, medium-brownish-grey weathered, thin-bedded, attitude of beds 161°/24°NE

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b>ID2001-05: About 400 m Southeast of South Peak</b>			
15264	Rundle	1¼	<u>Lime Mudstone</u> , medium-grey weathered and fresh, solitaire corals to 4 cm, beds to 30 cm, attitude of beds 162°/50°E
15265	Rundle	1½	<u>Grainstone to Wackestone</u> , medium-grey weathered, light-grey fresh, grains to 2 mm, poor exposure
-	Rundle	~6	mostly covered, sporadic coarse <u>Calcarenite</u> float
15266	Rundle	2½	<u>Grainstone</u> , medium-grey weathered, very light grey fresh, coarse-grained, chips from scattered outcrops
15267	Rundle	2¾	<u>Grainstone</u> , as 15266
15268	Rundle	1¼	<u>Lime Mudstone</u> , medium-grey weathered, dark-grey fresh
-	Banff(?)	>80	mostly covered, black fresh on visible <u>Mudstone</u> boulders and rocks for ~120 m SW along seismic line from base of sample 15268
<b>ID2001-06: About 530 m Southeast of South Peak</b>			
15269	Rundle	~10	<u>Wackestone to Grainstone</u> , medium-grey weathered, light-grey fresh, <u>Wackestone</u> grades upwards to <u>Grainstone</u> ; poor exposure, attitude of beds 148°/65°E
<b>ID2001-07: South Ridge</b>			
10917	Rundle	2¼	<u>Grainstone</u> , as 10915, but less coarse
10916	Rundle	4	<u>Grainstone</u> , as 10915
10915	Rundle	2	<u>Grainstone</u> , light-grey, coarse-grained, crinoids and shell fragments, grains up to 5 mm, crumbly
10914	Rundle	3	<u>Interbedded Dolomitic Grainstone and Dolomite</u> , light-tan-grey, fine-grained dolomite interbeds, numerous vugs to ½ mm diameter, some vugs calcite filled, within recessive interval on top of cliff
10913	Rundle	3	<u>Wackestone</u> , light-grey to buff, oolitic, beds ~10 cm
10912	Rundle	1¾	<u>Grainstone</u> , light-grey, beds ¼ to ½ m, one thin bed of <u>Wackestone</u>
10911	Rundle	3	<u>Grainstone to Wackestone</u> , light-grey, massive, coarse-grained
10910	Rundle	2¾	<u>Grainstone to Wackestone</u> , interbedded, thick-bedded to massive, attitude of beds 154°/67°NE
10909	Rundle	2	<u>Grainstone-Wackestone-Mudstone</u> , interbeds
10908	Rundle	1¾	<u>Grainstone</u> , light-grey, massive, well-jointed, attitude of beds 151°/57°NE

## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
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**MARBLE MOUNTAIN** (MAIM Permit 9398100125)**MM2001-01: Main Peak of Eastern Ridge North of Moose Creek**

10953	Rundle	3¼	<u>Wackestone</u> , dark-grey, crinoidal, grains to 2 mm, beds 15 to 50 cm
10952	Rundle	1¼	<u>Grainstone-Wackestone-Mudstone</u> , interbedded
10951	Rundle	5¼	<u>Dolomite</u> , recessive, light-brown, fine-grained, thin-bedded, coarsens upward into medium-grey <u>Dolomite</u>
10925	Rundle	2½	<u>Mudstone</u> , medium-brownish-grey, vuggy, thin-bedded with interbeds of <u>Wackestone</u> , attitude of beds 164°/39°SW
10924	Rundle	2¼	<u>Interbedded Grainstone and Wackestone</u> , as 10923
10923	Rundle	4	<u>Interbedded Grainstone and Wackestone</u> , medium-grey, crinoids, grains 2 to 3 mm, beds thin to 15 cm
10922	Rundle	3	<u>Grainstone</u> , light grey, coarse-grained, massive, one 15 cm bed of medium- to dark-grey <u>Mudstone</u> , grades upward into medium-grained, light-grey <u>Grainstone</u> , beds 5 to 10 cm in upper portion
10921	Rundle	3	<u>Grainstone</u> , very light-grey, very coarse grained, crinoidal
10920	Rundle	3	<u>Wackestone</u> , light grey, crinoidal
10919	Rundle	2½	<u>Wackestone and Lime Mudstone</u> , interbedded, medium-grey
-	Banff	2¾	<u>Mudstone</u> , mostly covered, recessive, thin-bedded, vuggy, dark-grey
10918	Banff	2	<u>Mudstone</u> , dark-grey, vuggy, beds 5 to 15 cm, attitude of beds 139°/45°SW

**MM2001-02: North Side of Moose Creek**

10959	Rundle	2¾	<u>Lime Mudstone</u> , medium to dark-grey, attitude of beds 77°/18°SE or 110°/9°SW; anticlinal axis plunges about -4° to SE across Moose Creek
10958	Rundle	3	<u>Lime Mudstone</u> , medium- to dark-grey fresh, massive
10957	Rundle	3¼	<u>Lime Mudstone</u> , medium-grey, massive
10956	Rundle	3	<u>Lime Mudstone to Wackestone</u> , medium-grey
10955	Rundle	2	<u>Wackestone</u> , medium-grey, grains up to 4 mm, massive
10954	Rundle	4	<u>Wackestone</u> , light- to medium-grey, massive

**MM2001-03: East of Section 99-17**

10961	Rundle	8-8½	<u>Wackestone to Grainstone</u> , as 10960, few darker grey chips
10960	Rundle	8-8½	<u>Wackestone to Grainstone</u> , light-grey to medium-grey, coarse-grained, massive
-	Rundle	-	<u>Micritic Limestone</u> , dark-grey, beds 15 to 30 cm thick

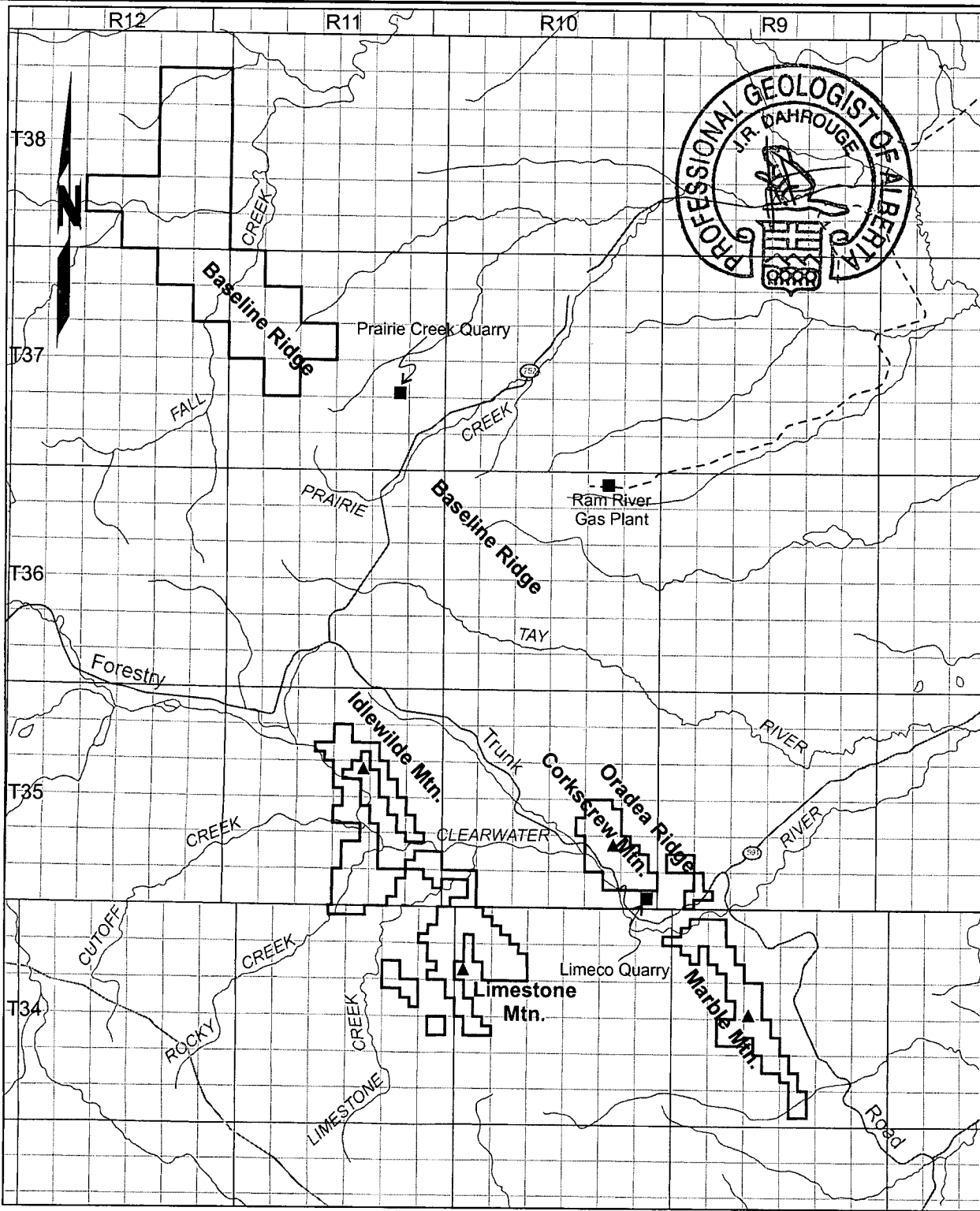
## APPENDIX 3: CONTINUED

Sample	Formation	Strat. Thick. (m)	Description
<b><u>PINENEEDLE CREEK ANTICLINE, LIMESTONE MOUNTAIN</u></b> (MAIM Permit 9398100125)			
<b>PA2001-01: Core of Pineneedle Creek Anticline</b>			
11333	Rundle	5½	<u>Sparry Mudstone</u> , medium-grey weathered, dark-brownish-black fresh, thin laminated beds, attitude of beds 164°/29°W
-	Rundle	15(?)	covered
11334	Rundle	4	<u>Sparry Mudstone</u> , as 11333
11335	Rundle	~½	<u>Mudstone</u> , medium-grey weathered, medium- to light-brownish-grey fresh, orange-brown stained, vuggy
-	Rundle	26(?)	covered
11336	Rundle	6	<u>Wackestone</u> , medium-grey weathered, dark-brownish-grey fresh, grains up to 1½ mm, crinoid oscicles, massive, possible attitude of beds 164°/12°W
-	Rundle	3(?)	covered
11337	Rundle	~3½	<u>Wackestone</u> , medium-grey weathered, medium- to dark-brownish-grey fresh, massive; lowermost 40 cm is a bed of <u>Grainstone</u> , sharp lower contact with recessive unit below, possible attitudes of beds 038°/20°NW, 134°/12°NE in core of northerly-plunging anticline
11338	Rundle	1	<u>Dolomitic Mudstone</u> , tan and white weathered, brownish-grey fresh, recessively weathered, fractured, vuggy, few calcite filled vugs, orange-brown stain on joints
11339	Rundle	2¼	<u>Wackestone to Packstone</u> , medium- to dark-grey weathered, brownish-medium-grey fresh, crystals ~1½ mm in size, few pinhole vugs, orange-brown stain
11340	Rundle	3	<u>Wackestone</u>
11341	Rundle	4	<u>Wackestone</u>
-	Rundle	½	covered
11342	Rundle	2	<u>Wackestone</u> , continuous sampling from 11337 to 11342
11343	Rundle	6¾	<u>Packstone</u> , medium-grey weathered, medium-purplish-grey fresh, grades upward to grainstone, massive, crinoid oscicles, possible attitude of beds 185°/22°W, possibly overlapped with sample 11342





**APPENDIX 4: STATEMENT OF QUALIFICATIONS**

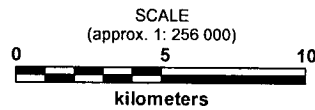
J.R. Dahrouge obtained degrees in geology and computing science from the University of Alberta, Edmonton in 1988 and 1994, respectively. He has more than ten years of experience in mining exploration. He is a member of the Canadian Institute of Mining and Metallurgy and is registered as P. Geol. in the Association of Professional Engineers, Geologists, and Geophysicists of Alberta.

J.R. Dahrouge does not hold any direct or indirect interest in the metallic and industrial minerals permits which are the subject of this report.



**LEGEND & SYMBOLS**

-  Metallic and Industrial Minerals Permit of Graymont Western Canada Inc.
-  Highway or Secondary Road
-  Railway
-  Park or Protected Area

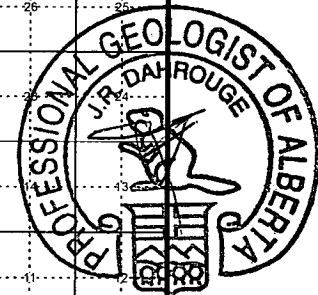
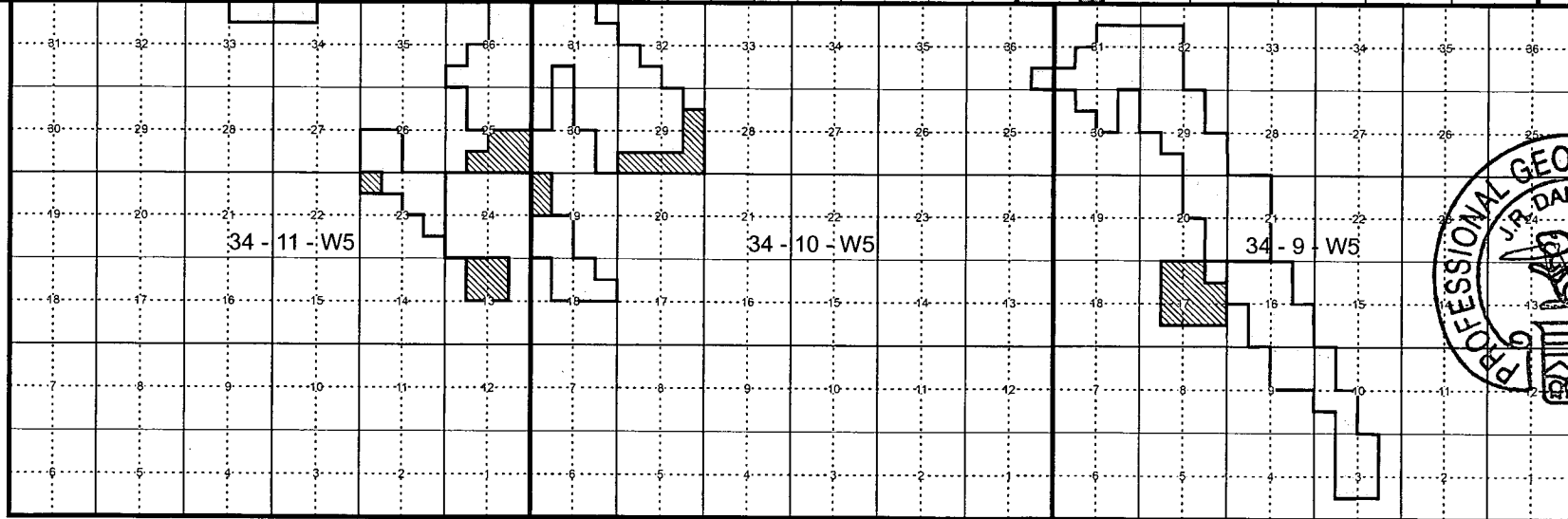
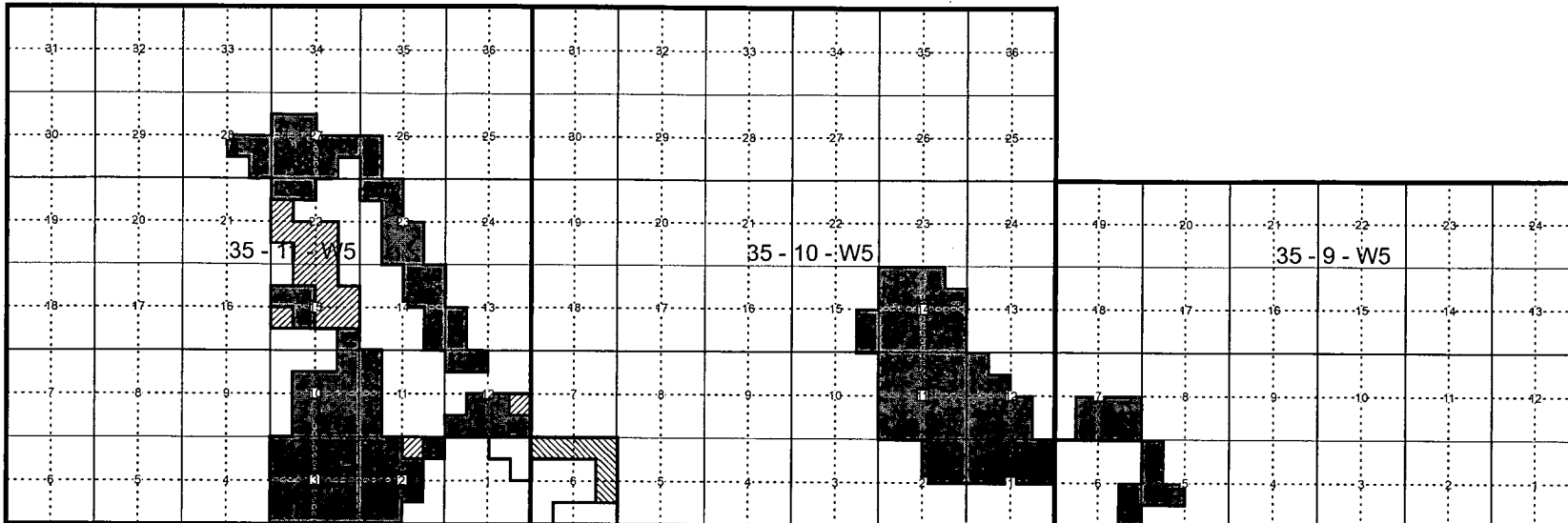


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EDMONTON, ALBERTA

CLEARWATER & LIMESTONE RANGES, ALBERTA

**Fig. 3.1 Location Map**





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Edmonton, Alberta



WEST-CENTRAL ALBERTA

Fig. 3.2  
Metallic and Industrial Minerals  
Permits 9396020019 and 9398100125.

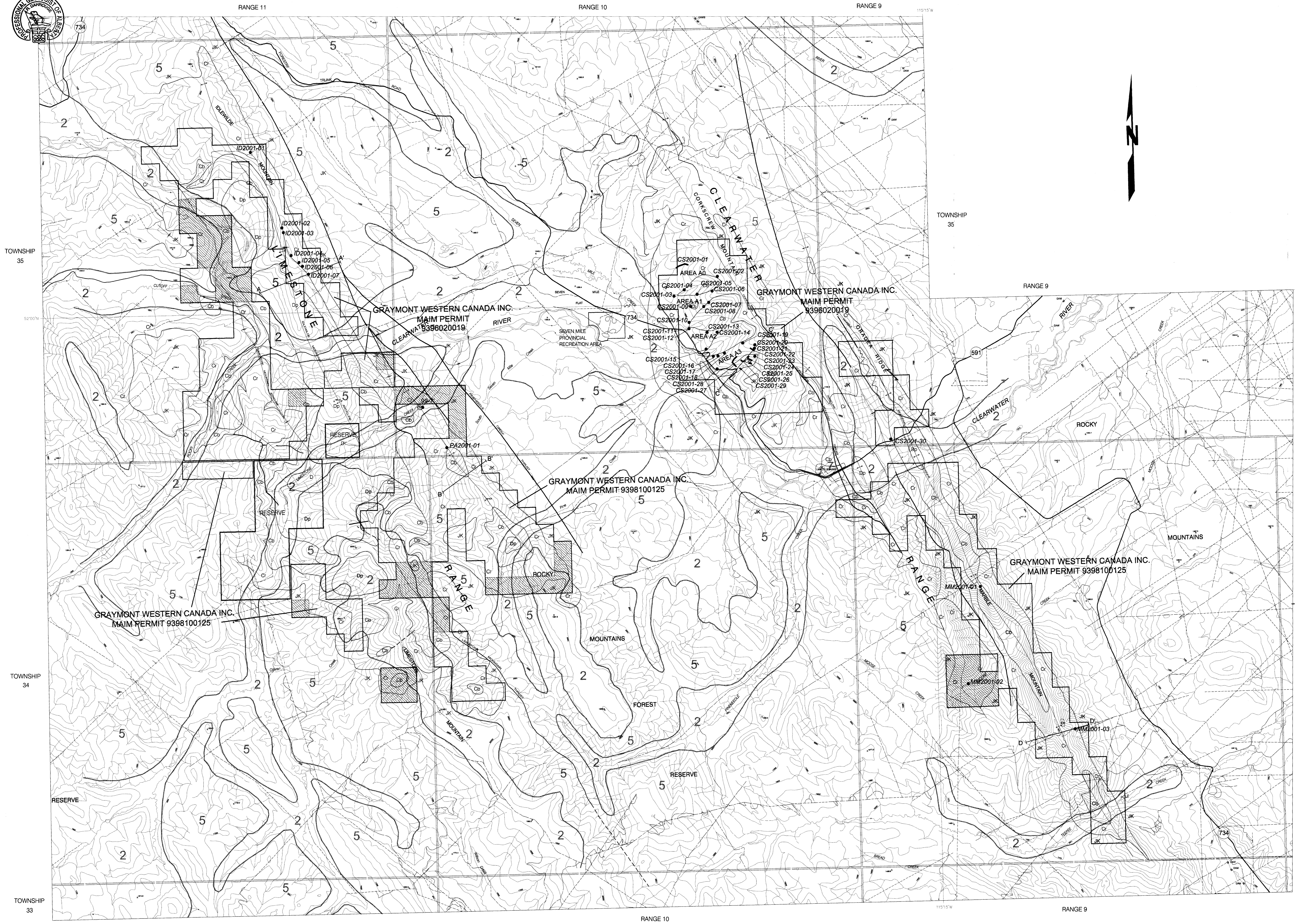
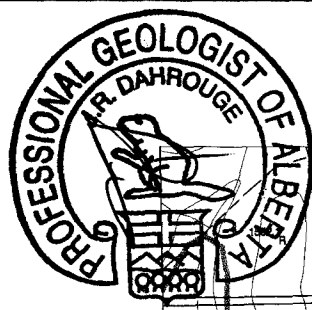
**Corkscrew Mountain Permit**

-  Current area of MAIM Permit 9396020019 (2,640 ha.)
-  Recommended reductions from MAIM Permit 9396020019 (240 ha.)

**Limestone Mountain Permit**

-  Current area of MAIM Permit 9398100125 (2,928 ha.)
-  Recommended reductions from MAIM Permit 9398100125 (576 ha.)

Scale 0 1 2 5 10 Kilometers



LEGEND AND SYMBOLS

- JURASSIC AND LOWER CRETACEOUS
JK Undivided
CARBONIFEROUS RUNDLE GROUP
Cr Mount Head Formation: finely crystalline dolomite, finely to coarsely crystalline limestone, shale
Turner Valley Formation: dense and porous dolomite, argillaceous dolomite, limestone
Shunda Formation: thin-bedded, silty dolomite, cherty and dolomitic limestone, shale, anhydrite
Pekisko Formation: finely to coarsely crystalline calcarenite, fine-grained dolomite
Cb Banff Formation: argillaceous and cherty limestone, fissile and calcareous shale
DEVONIAN
Dp Palliser Formation: massive mottled limestone and dolomite, porous and vuggy dolomite, argillaceous limestone

- Geological boundary (approximate)
Fault (approximate)
Elevation contour (intervals: 25 m, 50 m)
Secondary highway with number
Trail or cut line
Maim Permit boundary
Proposed area to be dropped from current Maim permits
Eastern slopes land use zone boundary; zone number (2 - Critical Wildlife, 5 - Multiple Use, 7 - Industrial)
Sampled section; number
Line of cross-section

NOTES

- 1) Map compiled from 1 : 20 000 scale digital base maps 82Q/13NE, 14N, 83B/3W, and 4SE supplied by Spatial Data Warehouse Ltd., Calgary, Alberta.
2) Geology modified after Henderson (1943, 1944), and Olienenshaw (1964, 1965).
3) UTM grid is based on North American Datum, 1983 (NAD83); UTM grid zone: 11U.
4) To accompany Assessment Report entitled "Exploration for High-Calcium Limestone at Clearwater and Limestone Ranges of West-Central Alberta" dated 2002-06-14.

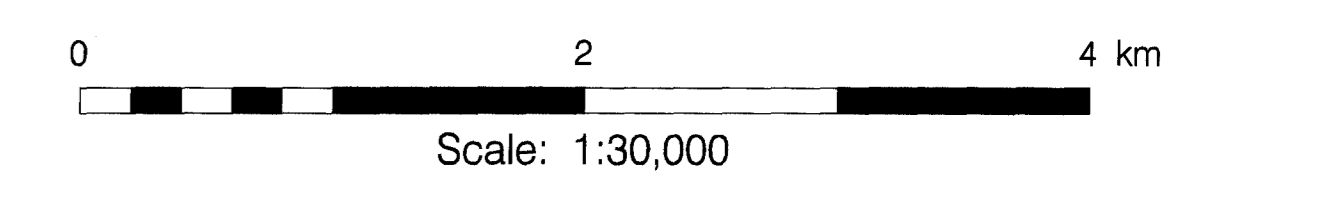
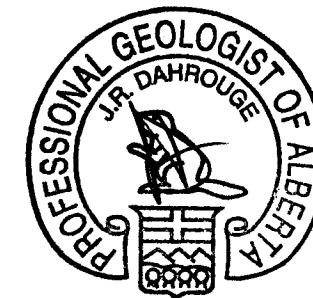


Table with 2 columns: REVISIONS (BY, DATE) and GRAYMONT WESTERN CANADA INC. (DAHROUGE GEOLOGICAL CONSULTING LTD., WEST-CENTRAL ALBERTA, Fig. 4.1 Geology and Sample Locations at the Corkscrew Mountain and Limestone Mountain Maim Permits, W.M., 1999.03)





**LEGEND AND SYMBOLS**

**JURASSIC AND LOWER CRETACEOUS**

JK Undivided

**CARBONIFEROUS**

**RUNDLE GROUP**

- Cr Mount Head Formation: finely crystalline dolomite, finely to coarsely crystalline limestone, shale
- Turner Valley Formation: dense and porous dolomite, argillaceous dolomite, limestone
- Shunda Formation: fine-grained dolomite; thin-bedded, silty dolomite, cherty and dolomitic limestone, shale, anhydrite
- Pekisko Formation: finely to coarsely crystalline calcarenite, fine-grained dolomite

Cb Banff Formation: argillaceous and cherty limestone, fissile and calcareous shale

**DEVONIAN**

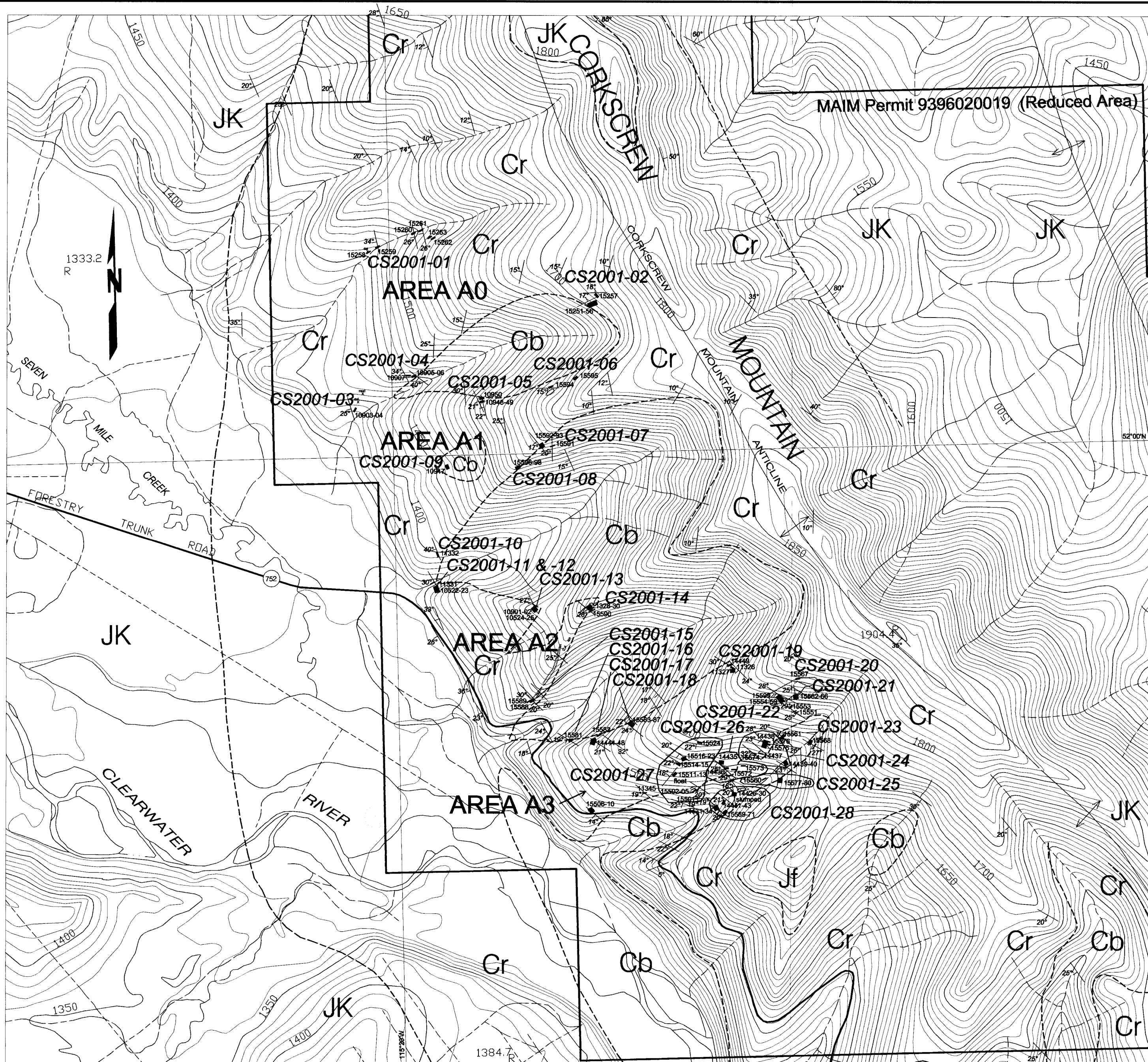
Dp Palliser Formation: massive mottled limestone and dolomite, porous and vuggy dolomite, argillaceous limestone

- Geological boundary (approximate) . . . . .
- Bedding (inclined, vertical, overturned, horizontal) . . . . .
- Fault (approximate) . . . . .
- Synclinal axis (arrow indicates plunge) . . . . .
- Anticlinal axis (arrow indicates plunge) . . . . .
- Sample section with sample numbers . . . . .
- Isolated sample with sample number . . . . .
- Elevation contour (interval: 10 m) . . . . .
- Secondary highway with number . . . . .
- Gravel road, dry weather . . . . .
- Trail or cut line . . . . .
- MAIM Permit boundary . . . . .

**NOTES**

- 1) Map compiled from 1 : 20 000 scale digital base maps 82Q/13NE, 14NW, 83B/SSW, and 4SE supplied by Spatial Data Warehouse Ltd., Calgary, Alberta.
- 2) Geology modified after Henderson (1943, 1944), and Oilerenshaw (1964, 1965).
- 3) UTM grid is based on North American Datum, 1983 (NAD83); UTM grid zone: 11U.
- 4) To accompany Graymont Western Canada Inc. Assessment Report entitled "Exploration for High-Calcium Limestone at Clearwater and Limestone Ranges of West-Central Alberta" dated 2002 06 14.
- 5) See Appendices 4A and 4B for sample descriptions and analyses.

REVISIONS		W.M.	DATE	GRAYMONT WESTERN CANADA INC.	
					2002.06
				CLEARWATER AND LIMESTONE RANGES, WEST-CENTRAL ALBERTA	
				Fig. 4.2 Geology and Sample Locations on the West Flank of Corkscrew Mountain	
				0  1 km	
				W.M. Scale: 1:12,500 2000.06	



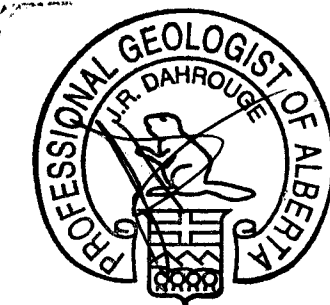
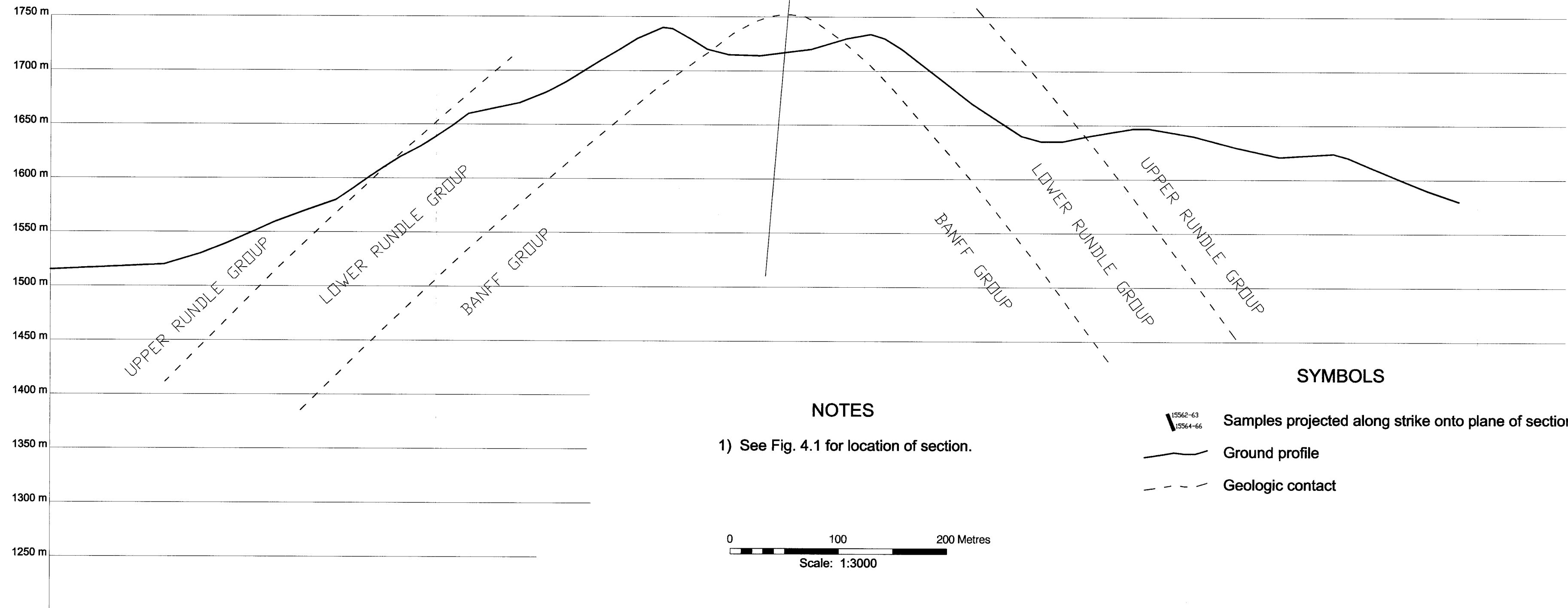
B

# PINENEEDLE RIDGE

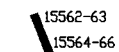


B'

SOUTHWEST

NORTHEAST

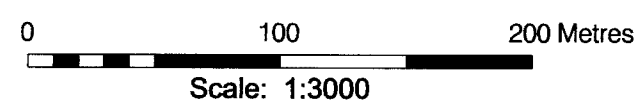


### SYMBOLS

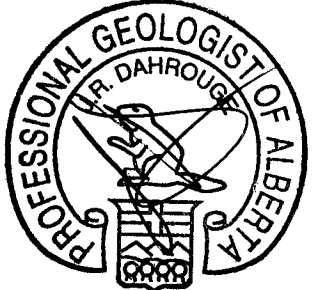
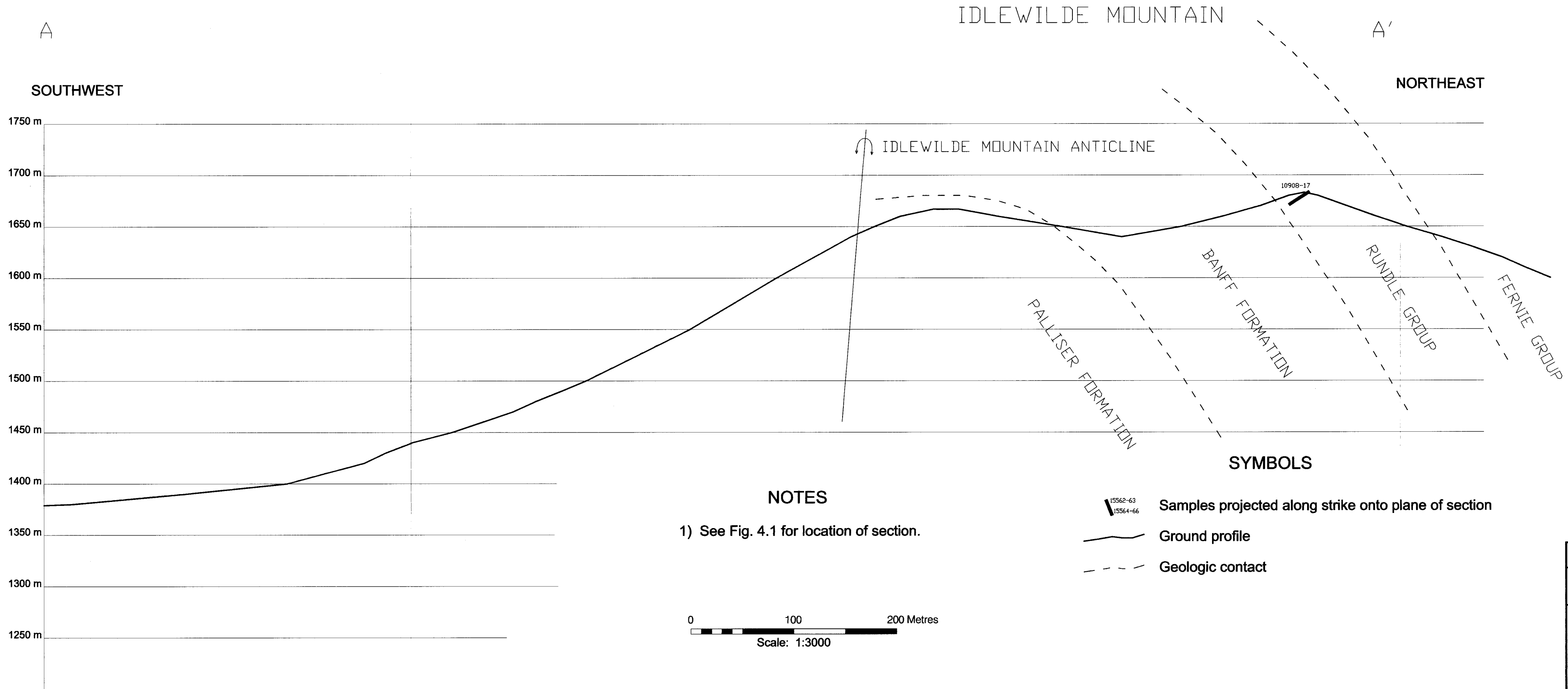
-  15562-63  
15564-66    Samples projected along strike onto plane of section
-     Ground profile
-     Geologic contact

### NOTES

- 1) See Fig. 4.1 for location of section.



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CLEARWATER & LIMESTONE RANGES, WEST-CENTRAL ALBERTA	
<b>Figure 5.2</b> Cross-Section B-B' through Pineneedle Creek Anticline	
WM	2002.06

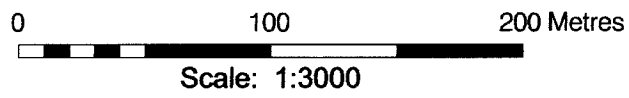


**NOTES**

1) See Fig. 4.1 for location of section.

**SYMBOLS**

- 15562-63  
15564-66 Samples projected along strike onto plane of section
- Ground profile
- Geologic contact

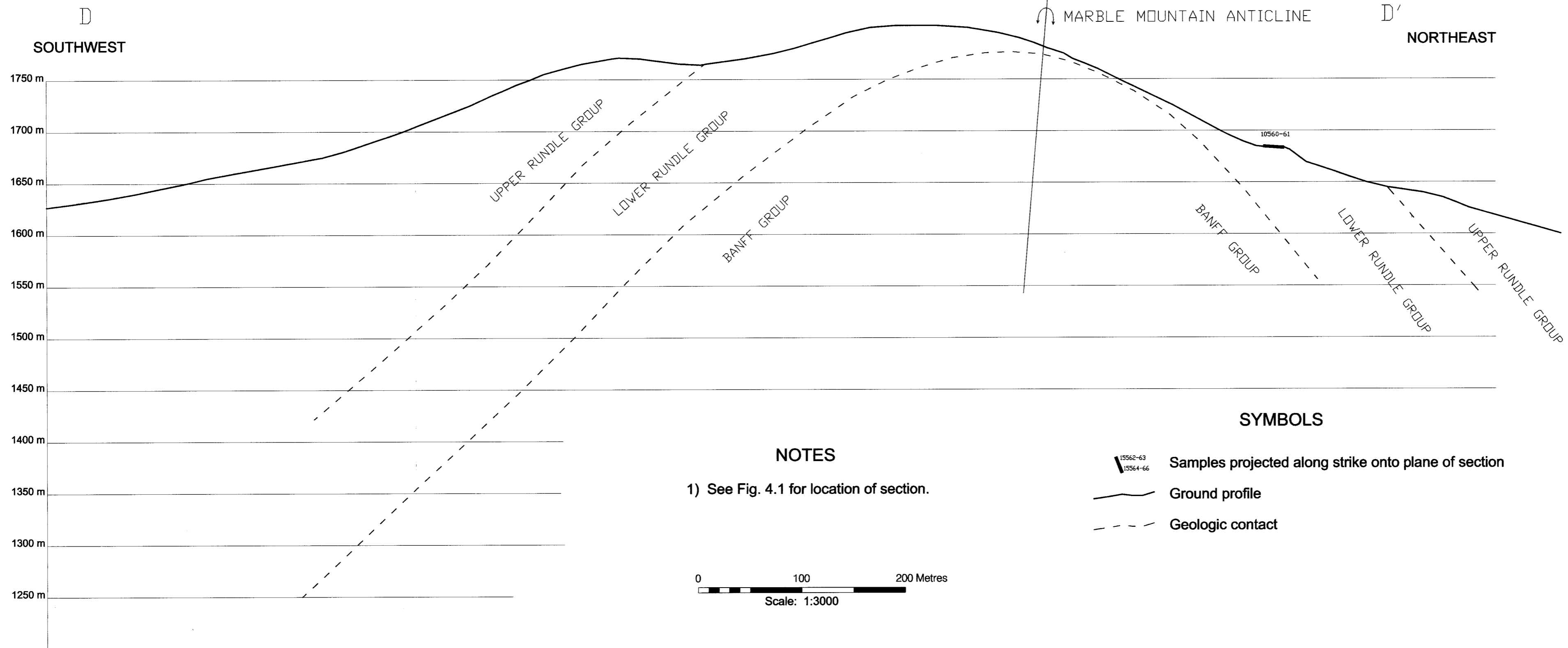


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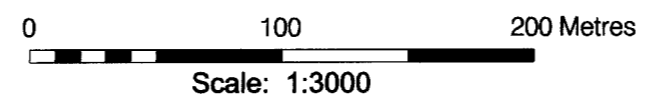
**Figure 5.1**  
**Cross-Section A-A' through**  
**Idlewild Mountain**

# MARBLE MOUNTAIN



### NOTES

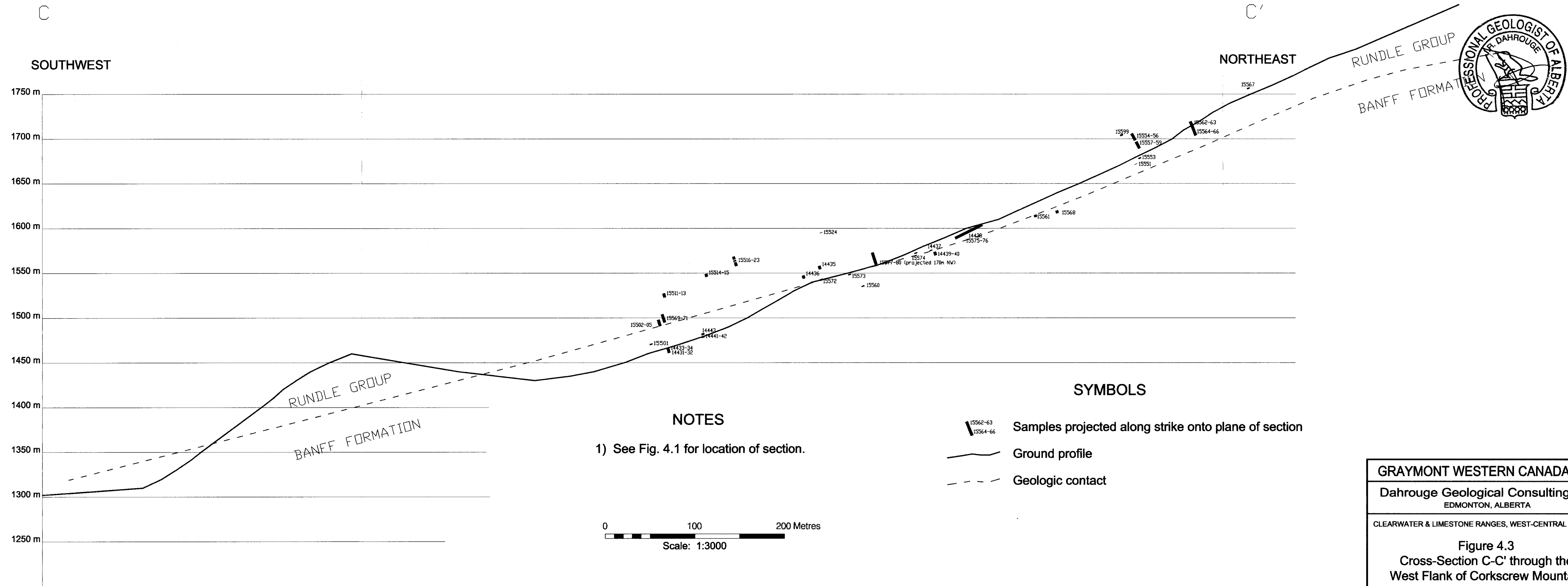
1) See Fig. 4.1 for location of section.



### SYMBOLS

- 15562-63  
15564-66 Samples projected along strike onto plane of section
- Ground profile
- Geologic contact

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CLEARWATER & LIMESTONE RANGES, WEST-CENTRAL ALBERTA	
<b>Figure 4.4</b> Cross-Section D-D' near the South End of Marble Mountain	
WM	2002.06



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CLEARWATER & LIMESTONE RANGES, WEST-CENTRAL ALBERTA

**Figure 4.3**  
Cross-Section C-C' through the  
West Flank of Corkscrew Mountain

WM 2002.06