

MAR 20060017: EAST FIREBAG

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20060017

GRAYMONT WESTERN CANADA INC.

**2005 AND 2006 EXPLORATION
OF THE EAST FIREBAG PERMIT**

PART B

Metallic and Industrial Mineral Permit
9304050884

Geographic Coordinates

57°29' N
110°59' W

NTS Sheets 74E/6, 74 E/7, 74E/11

Owner of MAIM Permit	9304050884 Graymont Western Canada Inc. 190, 3025 - 12 Street N.E. Calgary, AB, T2E 7J2
Operator:	Graymont Western Canada Inc. 190, 3025 - 12 Street N.E. Calgary, AB, T2E 7J2
Consultant:	Dahrouge Geological Consulting Ltd. 18, 10509 - 81 Avenue Edmonton, Alberta T6E 1X7
Authors:	J. Dahrouge, B.Sc., P.Geol.
Date Submitted:	September 18, 2006

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1. SUMMARY

Between 2005 and early 2006, exploration of Metallic and Industrial Minerals (MAIM) Permit 9304050884 of Graymont Western Canada Inc. along the Firebag River, northeast of Fort MacKay, included two property visits and the relogging of historic drill cores that were stored at the EUB core storage facility in Calgary, Alberta.

Results of the exploration showed the permit to be underlain by significant thicknesses of Cretaceous sediments; which in turn, are unconformably underlain by variably quality limestone, argillaceous limestone, dolomitic limestone, calcareous shales and calcareous sandstones, likely of the Slave Point and Methy formations.

The 2005 thru 2006 exploration expenditures for MAIM Permit 9304050884 totaled \$48,119.25 (Part C, Appendix 1). The expenditures were sufficient to maintain the entirety of the property in good standing. The expenditures are to be applied towards work period years 1 and 2, and excess expenditures carried over to work period years 3 and 4 for the retained lands.

2. INTRODUCTION

The exploration objectives of the 2005 thru 2006 exploration were to locate high-quality carbonate rocks of the Slave Point Formation below the sub-Cretaceous unconformity and evaluate their quarriability. To achieve the objectives, two separate visits to the property were conducted in order to locate outcrops along Firebag River. In addition, a visit was made to the EUB core storage facility in Calgary, Alberta, where historic drill cores from the permit area were re-logged.

3. LOCATION AND ACCESS

MAIM Permit 9304050884 (Fig's. 3.1 and 3.2) is located within National Topographic System Map Sheets 74 E/6, 74E/7, and 74E/11, and is centered at approximately 57°29' N latitude, 110°59' W longitude.

The permit area can be accessed by traveling from Edmonton to Fort MacKay along Highway 63 from Edmonton to Fort MacKay, and then north along the winter road towards Fort Chipewyan. Trails and cutlines were utilized with ATV's to access and explore the property.

In total, seven historic drill cores were examined from the permit. Their locations are shown in Fig. 3.3.

4. WORK PERFORMED

The work on the East Firebag Permit was conducted by Dahrouge Geological Consulting Ltd. (Dahrouge) on behalf of Graymont Western Canada Inc. (Graymont).

From August 12 to 19, 2005, the northern section of the property was explored on the ground, by hiking along Firebag River. From September 16 to 19, 2005, the southern section of the property along Firebag River was examined with the use of a helicopter (Appendix 2). Subsequently, logs from historic drill holes were examined, and depths to the sub-Cretaceous unconformity estimated (Appendices 3A and 3B).

From April 10 to 13, 2006, seven historic drill cores, stored at the EUB core storage facility in Calgary, Alberta, were examined and individual stratigraphic units described, measured, and quality assessed using a solution of 5% HCl (Appendix 4).

5. RESULTS

The ground exploration conducted in the northern portion of the property revealed no dolomite or limestone outcrops, only Cretaceous sandstones and tar sands. The helicopter reconnaissance work identified one limestone outcrop, described as a grey, fine-grained, well-bedded lime mudstone (Appendix 2; Fig. 3.3).

A total of fourteen drill holes were previously completed for tar sands exploration within the East Firebag Permit. Logs from these holes were examined, and depths to the sub-Cretaceous unconformity estimated, ranging from 30 m to 200 m (Appendix 3B; Fig. 5.1).

In April, 2006, seven historic drill holes were examined and logged (Appendix 4; Fig. 3.3). All of the drill holes intersected Paleozoic sequences of the Methy or Slave Point formations. At the East Firebag Permit, the drill holes showed the Devonian units to consist primarily of moderate to good quality lime mudstone; and low quality, brecciated limestone, argillaceous limestone, dolomitic limestone and calcareous sandstone.

6.**CONCLUSIONS**

In the permit area, the depth to the sub-Cretaceous unconformity varies greatly and reaches approximately 200 m. Very limited outcrop exists, as only one outcrop was identified during 2005 exploration. The section was lime mudstone, likely of the Slave Point Formation.

Diamond drilling is recommended as the next stage of exploration to accurately determine the depth and quality of the underlying carbonates within the property area.

7.

REFERENCES

Norris, A.W. (1963) Devonian Stratigraphy of Northeastern Alberta and Northwestern Saskatchewan; Geol. Surv. Can., Mem 313.

STATEMENT OF AUTHOR

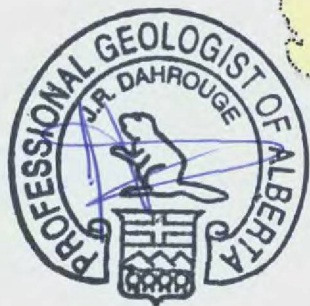
I, Jody Dahrouge, residing at 11 Country Lane, Stony Plain, Alberta, do hereby certify that:

- I am a geologist of Dahrouge Geological Consulting Ltd., Suite 18, 10509 - 81 Ave, Edmonton, Alberta, T6E-1X7.
- I am a graduate of the University of Alberta, Edmonton, Alberta with a B.Sc. in Geology, 1988 and a Special Certificate (Sp.C.) in Computing Science in 1994.
- I have practiced my profession as a geologist intermittently from 1988 to 1994, and continuously since 1994.
- I am a registered professional geologist with the Association of Professional Engineers, Geologists and Geophysicists of Alberta, member M48123.
- I hereby consent to the copying or reproduction of this Technical Report following the one-year confidentiality period.
- I am the author of the report entitled "2005 and 2006 Exploration of the East Firebag Permit" and accept responsibility for the veracity of technical data and results.

Dated this 18th day of September, 2006.

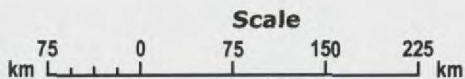


Jody Dahrouge, BSc, PGeol
APEGGA M48123



LEGEND

- Provincial capital
- Other populated places
- ◆— Trans-Canada Highway
- Major road
- - - International boundary
- Provincial boundary



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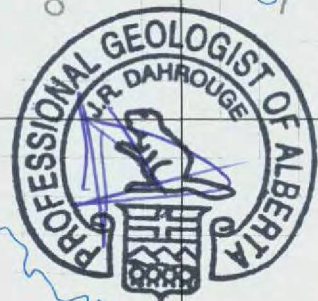
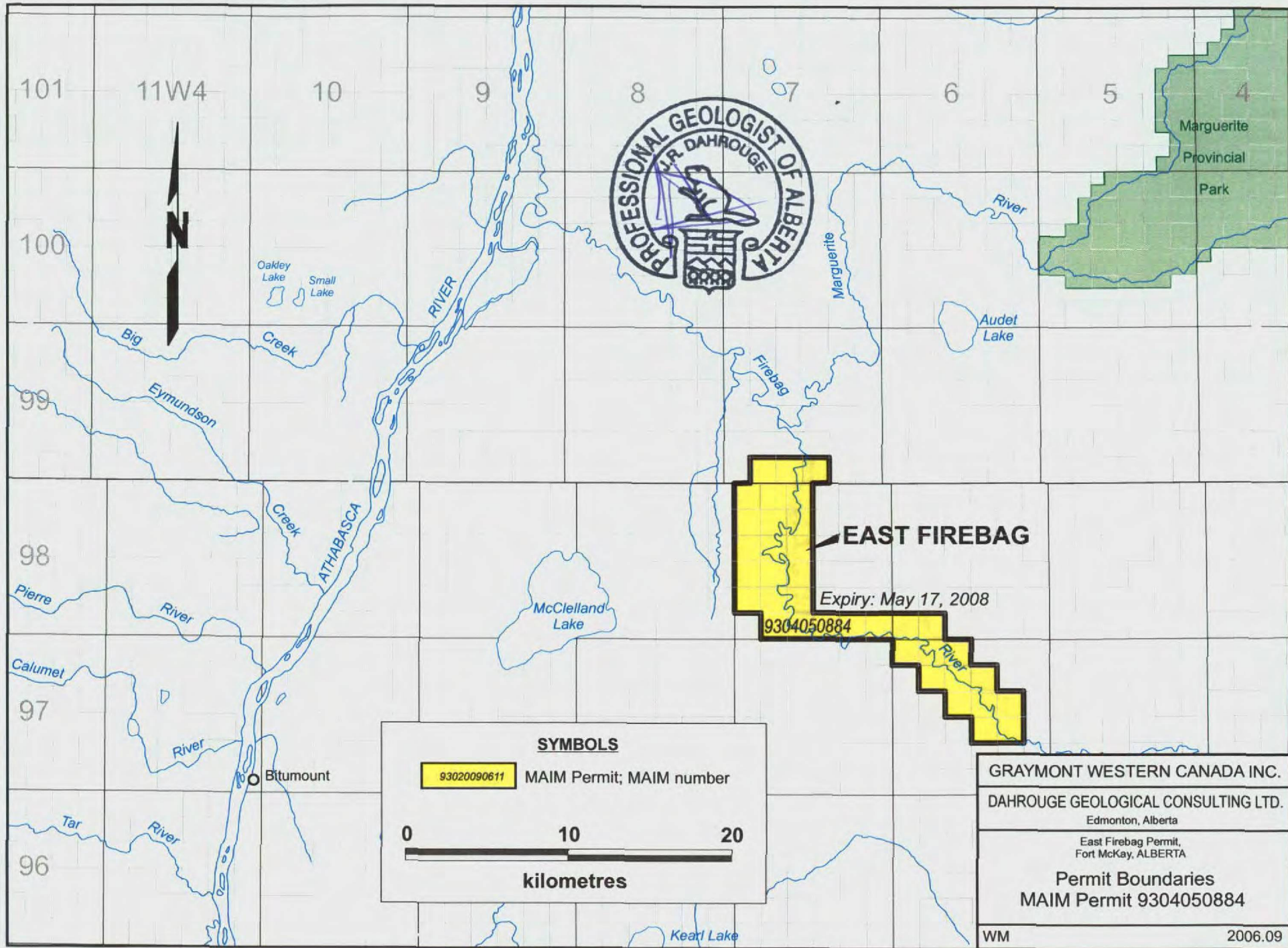
Location of
 MAIM Permit
 9304050884

GRAYMONT WESTERN CANADA INC.
 DAHROUGE GEOLOGICAL CONSULTING LTD.
 Edmonton, Alberta
 FORT MCKAY, ALBERTA

Fig. 3.1 Location Map

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70060017



SYMBOLS

93020090611 MAIM Permit; MAIM number

0 10 20

kilometres

GRAYMONT WESTERN CANADA INC.	
DAHROUGE GEOLOGICAL CONSULTING LTD. Edmonton, Alberta	
East Firebag Permit, Fort McKay, ALBERTA	
Permit Boundaries MAIM Permit 9304050884	
WM	2006.09

Rg 7

Rg 6

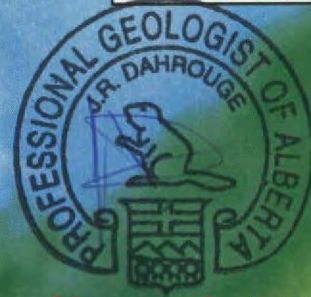
Legend

High
Low

Probable depth to sub-Cretaceous (m)

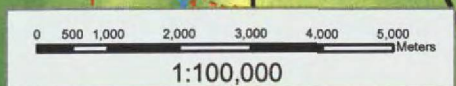
- 18 - 24
- 25 - 29
- 30 - 39
- 40 - 49
- 50 - 119
- 120 - 200

— Graymont MAIM-permit



Tp 98

Tp 97



GRAYMONT WESTERN CANADA
Dahrouge Geological Consulting Ltd.
EDMONTON, ALBERTA
EAST FIREBAG PROPERTY, NORTHEAST ALBERTA

Fig. 5.1 Probable Depth to Sub-Cretaceous Unconformity

NM 2006.09

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**APPENDIX 1: COST STATEMENT FOR THE 2005 AND 2006 EXPLORATION
CONDUCTED ON THE EAST FIREBAG PERMIT**

a) <u>Personnel</u>	\$ 27,767.04
b) <u>Food and Accommodation</u>	\$ 2,276.78
c) <u>Transportation</u>	\$ 12,975.81
d) <u>Report</u>	\$ 53.63
e) <u>Other</u>	\$ 671.53
<u>Total</u>	<u>\$ 43,744.77</u>
<u>Administration</u>	<u>\$ 4,374.48</u>
<u>Total plus Administration</u>	<u>\$ 48,119.25</u>

APPENDIX 2: OUTCROP DESCRIPTION AT THE EAST FIREBAG PERMIT

Section Number	Date	Stratigraphic Thickness (m)	Description
21676	9/21/2005	1.0	Limestone, tan-brown weathered, light-medium grey fresh, thinly bedded (2-5 cm), micro- to cryptocrystalline, little calcite, bituminous on fracture surfaces, easily fractured (soft), minor 1.5 cm brachiopod and 3 cm long rugose coral fossils, good reaction with HCl, attitude of joints*: 162°/84° and 046°/55°; attitude of bedding*: 233°/02°
21677	9/21/2005	1.0	Similar to 21676, limestone, thinly bedded, brown weathered, light grey fresh, some trace fossils

* All measurements reported using right hand rule format

APPENDIX 3A: LOCATIONS OF HISTORIC DRILL HOLES AT THE EAST FIREBAG PERMIT

Well Name	Logged	Hole ID	Spud Date	Tp.	RW4	Sec.	LSD	Longitude	Latitude
Suncor Audet 5-32-97-7	Core	1	04-Feb-05	97	7	32	5	111.112635	57.458816
Esso 82 Oslo OV BSL-78 10-6-98-7	Core	2	23-Jan-82	98	7	6	10	111.126339	57.477053
Suncor Audet 12-7-98-7	Core	3	06-Feb-05	98	7	7	12	111.139709	57.491496
Suncor Audet 16-18-98-7	Core	4	03-Feb-05	98	7	18	16	111.119654	57.509750
Synenco 04-120 Firebag 6-21-98-7	Core	5	25-Jan-04	98	7	21	6	111.078875	57.516987
Synenco 04-104 Firebag 14-21-98-7	Core	6	01-Feb-04	98	7	21	14	111.078875	57.524212
Synenco 04-077 Firebag 1AA/9-28-98-7	Core	7	26-Jan-04	98	7	28	9	111.065504	57.535231

APPENDIX 3B: ESTIMATED DEPTHS TO THE SUBCRETACEOUS UNCONFORMITY FOR DRILL HOLES AT THE EAST FIREBAG PERMIT

Well Name	Hole ID	Elevation (m)	Depth (m)	Depth to Paleozoic
37	AA 11-23-97-07-w4	359.9	69.5	60.5
38	AA 09-22-97-07-w4	356.7	105.8	96.8
39	AA 12-22-97-07-w4	379.5	98.4	89.4
40	AA 10-21-97-07-w4	368.2	93.9	84.9
41	AA 13-21-97-07-w4	362.3	128.9	119.9
42	AA 14-20-97-07-w4	361.5	144.2	135.2
44	AA 01-33-97-07-w4	340.3	78.3	69.3
45	AA 12-27-97-07-w4	346.8	60.3	51.3
46	AA 09-27-97-07-w4	335.5	58.8	49.8
47	AA 14-26-97-07-w4	341	50	41
IMP 04 KEARL OV 2-15-97-7	2-15-97-7 w4	382.3	114	105
IMP 04 KEARL OV 2-16-97-7	2-16-97-7 w4	361.9	129	120
IMP 04 KEARL OV 2-17-97-7	2-17-97-7 w4	345.5	110	101
IMP 04 KEARL OV 2-18-97-7	2-18-97-7 w4	322.9	86	77
IMP 04 KEARL OV 2-19-97-7	2-19-97-7 w4	323.9	110	101
IMP 04 KEARL OV 2-2-97-7	2-2-97-7 w4	376.4	143	134
IMP 04 KEARL OV 2-35-96-7	2-35-96-7 w4	365.9	135	126
IMP 04 KEARL OV 2-34-97-7	2-34-97-7 w4	373.2	163	154
IMP 04 KEARL OV 2-4-97-7	2-4-97-7 w4	355.2	116	107
IMP 04 KEARL OV 2-7-97-7	2-7-97-7 w4	329.4	110	101
IMP 04 KEARL OV 2-8-96-7	2-8-96-7 w4	346	112	103
IMP 04 KEARL OV 2-8-97-7	2-8-97-7 w4	342	123	114
IMP 04 KEARL OV 2-9-97-7	2-9-97-7 w4	351.4	131	122
IMP 04 KEARL OV 3-16-97-7	3-16-97-7 w4	340.5	141	132
IMP 04 KEARL OV 3-17-96-7	3-17-96-7 w4	335	90	81
IMP 04 KEARL OV 3-18-96-7	3-18-96-7 w4	340.2	137	128
IMP 04 KEARL OV 3-19-96-7	3-19-96-7 w4	341.1	135	126
IMP 04 KEARL OV 3-20-97-7	3-20-96-7 w4	338.4	125	116
IMP 04 KEARL OV 5-7-96-7	5-7-96-7 w4	338.9	116	131
IMP 04 KEARL OV 5-8-97-7	5-8-97-7 w4	334.1	140	107
IMP 04 KEARL OV 6-10-96-7	6-10-96-7 w4	396.5	116	141
IMP 04 KEARL OV 6-14-96-7	6-14-96-7 w4	393.9	150	169
IMP 04 KEARL OV 6-14-97-7	6-14-97-7 w4	373.4	178	169
IMP 04 KEARL OV 6-15-96-7	6-15-96-7 w4	374.2	114	105
IMP 04 KEARL OV 6-16-96-7	6-16-96-7 w4	337.4	107	98
IMP 04 KEARL OV 6-16-97-7	6-16-97-7 w4	342.8	106	97
IMP 04 KEARL OV 6-17-96-7	6-17-96-7 w4	335.9	118	109
IMP 04 KEARL OV 6-17-97-7	6-17-97-7 w4	339	121	112
IMP 04 KEARL OV 6-18-96-7	6-18-96-7 w4	343.9	141	132
IMP 04 KEARL OV 6-18-97-7	6-18-97-7 w4	313.7	100	91
IMP 04 KEARL OV 6-19-96-7	6-19-96-7 w4	349.3	134	125
IMP 04 KEARL OV 6-20-96-7	6-20-96-7 w4	344.1	131	122
IMP 04 KEARL OV 6-21-96-7	6-21-96-7 w4	342.9	135	126
IMP 04 KEARL OV 6-21-97-7	6-21-97-7 w4	364.2	108	99
IMP 04 KEARL OV 6-22-97-7	6-22-97-7 w4	359.6	114	105
IMP 04 KEARL OV 6-23-96-7	6-23-96-7 w4	366.5	131	122
IMP 04 KEARL OV 3-6-96-7	3-6-96-7 w4	347.9	116	107
IMP 04 KEARL OV 3-7-96-7	3-7-96-7 w4	337.9	120	111
IMP 04 KEARL OV 4-16-97-7	4-16-97-7 w4	339.5	109	100
IMP 04 KEARL OV 4-17-97-7	4-17-97-7 w4	330.5	119	109
IMP 04 KEARL OV 4-18-97-7	4-18-97-7 w4	312.2	119	110

APPENDIX 3B: CONTINUED

Well Name	Hole ID	Elevation (m)	Depth (m)	Depth to Paleozoic
IMP 04 KEARL OV 4-19-96-7	4-19-96-7 w4	344.8	116	107
IMP 04 KEARL OV 4-19-97-7	4-19-97-7 w4	309.9	95	86
IMP 04 KEARL OV 4-2-97-7	4-2-97-7 w4	369	133	124
IMP 04 KEARL OV 4-33-96-7	4-33-96-7 w4	346.5	117	108
IMP 04 KEARL OV 4-6-97-7	4-6-97-7 w4	320.5	116	107
IMP 04 KEARL OV 4-7-96-7	4-7-96-7 w4	338.2	116	107
IMP 04 KEARL OV 4-7-97-7	4-7-97-7 w4	315.8	130	121
IMP 04 KEARL OV 4-8-97-7	4-8-97-7 w4	335.1	121	112
IMP 04 KEARL OV 4-9-97-7	4-9-97-7 w4	342.1	121	112
IMP 04 KEARL OV 7-20-97-7	7-20-97-7 w4	356	132	123
IMP 04 KEARL OV 6-22-97-7	6-22-97-7 w4	359.6	114	105
IMP 04 KEARL OV 6-21-97-7	6-21-97-7 w4	364.2	108	99
IMP 04 KEARL OV 16-22-97-7	16-22-97-7 w4	355	106	97
10-29-97-7	10-29-97-7 w4	327.9	105.2	96.2
10-30-97-7	10-30-97-7 w4	315.2	115	106
10-31-97-7	10-31-97-7 w4	294.73	31.1	22.1
10-32-97-7	10-32-97-7 w4	300.6	54.3	45.3
10-06-98-7	10-06-98-7 w4	292.7	90.8	81.8
3	02-24-97-7-w4	357.5	93.8	84.8
4	04-24-97-7-w4	353.6	63.4	54.4
5	03-23-97-7-w4	354.2	95.4	86.4
6	01-22-97-7-w4	356.8	92	83
7	04-22-97-7-w4	383.6	106.1	71
8	02-21-97-7-w4	352.1	115.2	97.1
9	01-20-97-7-w4	349.1	87.8	78.8
10	03-20-97-7-w4	350.6	124.4	115.4
12	07-28-97-7 w4	358.8	97.2	88.2
10-15-97-06	10-15-97-06-w4	367.9	78.6	69.6
10-16-97-06	10-16-97-06 w4	377	93.9	84.9
10-20-97-06	10-20-97-06 w4	372.6	69.5	60.5
10-21-97-06	10-21-97-06 w4	354.4	53	44
10-22-97-06	10-22-97-06 w4	360.9	61.9	52.9
10-27-97-06	10-27-97-06 w4	358.5	93.9	84.9
10-28-97-06	10-28-97-06 w4	350.5	162.5	153.5
10-29-97-06	10-29-97-07 w4	345.1	96.9	87.9
10-29A-97-06	10-29A-97-06 w4	345.1	112.2	103.2
10-33-97-06	10-33-97-06 w4	348.6	72.5	63.5
25	09-34-97-07 w4	329.8	81.7	72.7
26	12-34-97-07w4	332.4	80.2	71.2
27	10-33-97-07 w4	309.2	66.4	57.4
28	12-33-97-7 w4	304.7	71	62
29	15-04-98-07 w4	307.6	49.7	40.7
30	13-03-98-07 w4	311.3	54.2	45.2
31	16-03-98-7 w4	315	85.3	76.3
32	14-02-98-w4	312	71	62
33	12-01-98-07 w4	323.2	51.2	42.2
34	10-01-98-07 w4	323.2	45.1	36.1
35	11-06-98-06 w4	339.4	45.7	36.7
2	03-19-97-06 w4	402.5	102.7	93.7
synenco 03-048 firebag 13-35-98-07	13-35-98-07 w4	290	27	18
synenco 03-049 firebag 14-35-98-07	14-35-98-07 w4	293	29	20
synenco 03-050 firebag 15-35-98-07	15-35-98-07 w4	296	31	22
synenco 03-051 firebag 16-35-98-07	16-35-98-07 w4	299	33	24

APPENDIX 3B: CONTINUED

Well Name	Hole ID	Elevation (m)	Depth (m)	Depth to Paleozoic
synenco 03-052 firebag 15-36-98-07	15-36-98-07 w4	297	40	31
synenco 03-053 firebag 16-36-98-07	16-36-98-07 w4	297	50	41
synenco 03-055 firebag 12-35-98-07	12-35-98-07 w4	292	30	21
synenco 03-056 firebag 11-35-98-07	11-35-98-07 w4	295	35	26
synenco 03-057 firebag 10-35-98-07	10-35-98-07 w4	297	39	30
synenco 03-058 firebag 09-35-98-07	09-35-98-07 w4	300	42	33
synenco 03-059 firebag 12-36-98-07	12-36-98-07 w4	300	47	38
synenco 03-060 firebag 11-36-98-07	11-36-98-07 w4	300	51	42
synenco 03-061 firebag 10-36-98-07	10-36-98-07 w4	300	59	50
synenco 03-062 firebag 09-36-98-07	09-36-98-07 w4	300	69	60
synenco 03-063 firebag 05-35-98-07	05-35-98-07 w4	292	33	24
synenco 03-064 firebag 06-35-98-07	06-35-98-07 w4	295	39	30
synenco 03-065 firebag 07-35-98-07	07-35-98-07 w4	297	44	35
synenco 03-066 firebag 08-35-98-07	08-35-98-07 w4	300	53	44
synenco 03-067 firebag 05-36-98-07	05-36-98-07 w4	300	56	47
synenco 03-068 firebag 06-36-98-07	06-36-98-07 w4	300	60	51
synenco 03-069 firebag 07-36-98-07	07-36-98-07 w4	300	69	60
synenco 03-070 firebag 08-36-98-07	07-36-98-07 w4	300	62	53
synenco 03-072 firebag 04-35-98-07	04-35-98-07 w4	293	37	28
synenco 03-073 firebag 03-35-98-07	03-35-98-07 w4	295	44	35
synenco 03-074 firebag 02-35-98-07	02-35-98-07 w4	298	54	45
synenco 03-075 firebag 01-35-98-07	01-35-98-07 w4	300	61	52
synenco 03-076 firebag 04-36-98-07	04-36-98-07 w4	300	64	55
synenco 03-077 firebag 03-36-98-07	03-36-98-07 w4	300	67	58
synenco 03-078 firebag 02-36-98-07	02-36-98-07 w4	300	67	68
synenco 03-079 firebag 01-36-98-07	01-36-98-07 w4	300	55	46
synenco 03-080 firebag 13-26-98-07	13-26-98-07 w4	295	39	30
synenco 03-081 firebag 14-26-98-07	14-26-98-07 w4	297	50	41
synenco 03-088 firebag 12-26-98-07	12-26-98-07 w4	296	40	31
synenco 03-089 firebag 11-26-98-07	11-26-98-07 w4	298	52	43
synenco 03-095 firebag 05-26-98-07	05-26-98-07 w4	296	41	32
synenco 03-096 firebag 06-26-98-07	06-26-98-07 w4	299	52	43
synenco 03-0103 firebag 04-26-98-07	04-26-98-07 w4	297	41	32
synenco 03-0104 firebag 03-26-98-07	03-26-98-07 w4	299	51	42
synenco 03-0110 firebag 13-23-98-07	13-23-98-07 w4	299	43	34
synenco 03-0111 firebag 14-23-98-07	14-23-98-07 w4	300	53	44
synenco 03-0118 firebag 12-23-98-07	12-23-98-07 w4	300	44	35
synenco 03-0119 firebag 11-23-98-07	11-23-98-07 w4	301	56	47
synenco 03-0125 firebag 05-23-98-07	05-23-98-07 w4	302	46	37
synenco 03-0126 firebag 06-23-98-07	06-23-98-07 w4	303	57	48
synenco 03-0132 firebag 01-22-98-07	01-22-98-07 w4	302	43	34
synenco 03-0133 firebag 04-24-98-07	04-24-98-07 w4	309	78	69
synenco 03-028 firebag 15-34-98-07	15-34-98-07 w4	288	35	26
synenco 03-029 firebag 12-34-98-07	12-34-98-07 w4	290	46	37
synenco 03-031 firebag 07-34-98-07	07-34-98-07 w4	290	35	26
synenco 03-032 firebag 04-34-98-07	04-34-98-07 w4	290	51	42
synenco 03-034 firebag 15-27-98-07	15-27-98-07 w4	290	37	28
synenco 03-035 firebag 12-27-98-07	12-27-98-07 w4	290	53	44
synenco 03-037 firebag 07-27-98-07	07-27-98-07 w4	292	38	29
synenco 03-038 firebag 04-27-98-07	04-27-98-07 w4	292	56	47
synenco 03-041 firebag 15-22-98-07	15-22-98-07 w4	295	45	36
synenco 03-054 firebag 09-34-98-07	09-34-98-07 w4	290	35	26
synenco 03-071 firebag 01-34-98-07	01-34-98-07 w4	291	35	26

APPENDIX 3B: CONTINUED

Well Name	Hole ID	Elevation (m)	Depth (m)	Depth to
synenco 03-087 firebag 09-27-98-07	09-27-98-07 w4	293	36	27
synenco 03-102 firebag 01-27-98-07	01-27-98-07 w4	295	38	29
synenco 03-117 firebag 09-22-98-07	09-22-98-07 w4	299	40	31
synenco 03-082 firebag 15-26-98-07	15-26-98-07 w4	299	59	50
synenco 03-083 firebag 13-25-98-07	13-25-98-07 w4	300	68	59
synenco 03-084 firebag 14-25-98-07	14-25-98-07 w4	300	71	62
synenco 03-085 firebag 15-25-98-07	15-25-98-07 w4	300	66	57
synenco 03-086 firebag 16-25-98-07	16-25-98-07 w4	302	56	47
synenco 03-090 firebag 10-26-98-07	10-26-98-07 w4	300	63	54
synenco 03-091 firebag 12-25-98-07	12-25-98-07 w4	300	70	61
synenco 03-092 firebag 11-25-98-07	11-25-98-07 w4	300	70	61
synenco 03-093 firebag 10-25-98-07	10-25-98-07 w4	302	66	57
synenco 03-094 firebag 09-25-98-07	09-25-98-07 w4	305	59	50
synenco 03-097 firebag 07-26-98-07	07-26-98-07 w4	300	62	53
synenco 03-098 firebag 05-25-98-07	05-25-98-07 w4	300	71	62
synenco 03-099 firebag 06-25-98-07	06-25-98-07 w4	302	71	62
synenco 03-100 firebag 07-25-98-07	07-25-98-07 w4	305	71	62
synenco 03-101 firebag 08-25-98-07	08-25-98-07 w4	308	65	56
synenco 03-105 firebag 02-26-98-07	02-26-98-07 w4	300	60	51
synenco 03-106 firebag 04-25-98-07	04-25-98-07 w4	303	74	65
synenco 03-107 firebag 03-25-98-07	03-25-98-07 w4	305	75	66
synenco 03-108 firebag 02-25-98-07	02-25-98-07 w4	308	75	66
synenco 03-109 firebag 01-25-98-07	01-25-98-07 w4	310	71	62
synenco 03-112 firebag 15-23-98-07	15-23-98-07 w4	301	62	53
synenco 03-113 firebag 13-24-98-07	13-24-98-07 w4	304	77	68
synenco 03-114 firebag 14-24-98-07	14-24-98-07 w4	306	77	68
synenco 03-115 firebag 15-24-98-07	15-24-98-07 w4	308	76	67
synenco 03-116 firebag 16-24-98-07	16-24-98-07 w4	310	74	65
synenco 03-120 firebag 10-23-98-07	10-23-98-07 w4	302	67	58
synenco 03-121 firebag 12-24-98-07	12-24-98-07 w4	306	78	69
synenco 03-122 firebag 11-24-98-07	11-24-98-07 w4	308	79	70
synenco 03-123 firebag 10-24-98-07	10-24-98-07 w4	309	78	69
synenco 03-124 firebag 09-24-98-07	09-24-98-07 w4	310	76	67
synenco 03-127 firebag 07-23-98-07	07-23-98-07 w4	304	69	60
synenco 03-128 firebag 05-24-98-07	05-24-98-07 w4	308	79	70
synenco 03-129 firebag 06-24-98-07	06-24-98-07 w4	309	80	71
synenco 03-130 firebag 07-24-98-07	07-24-98-07 w4	310	79	70
synenco 03-131 firebag 08-24-98-07	08-24-98-07 w4	310	76	67
synenco 03-134 firebag 01-24-98-07	01-24-98-07 w4	310	75	66
synenco 03-135 firebag 13-24-98-07	13-24-98-07 w4	304	77	68

APPENDIX 4: LITHOLOGICAL LOGS FOR HISTORIC DRILL HOLES FROM THE EAST FIREBAG PERMIT

Abbreviations: **WW - Waterways Formation**
 FB - Firebag Member (of the Waterways Formation)
 SP - Slave Point Formation

DIAMOND DRILL LOG

Hole ID: 3
Company: Suncor
Well Name: Suncor Audet 12-7-98-7

Total Depth: 47.00m

Date Logged: April 10-13, 2006
Logged By: W. McGuire and S. Talwar

From (m)	To (m)	Thick. (m)	Formation	Member	Description
26.60	36.00	2.87	McMurray	-	McMurray oilsands
36.00	36.40	0.12	McMurray (?)	-	coarse calcareous sandstone, clear quartz grains cemented with calcite matrix (< 1/2 mm), good HCl reaction
36.40	41.60	1.58	McMurray (?)	-	mudstone, dark greyish brown to medium grey-brown, very little HCl reaction
41.60	44.00	0.73	McMurray (?)	-	mostly coarse calcareous sandstone with minor interbeds of dark-brown mudstone
44.00	44.40	0.12	McMurray (?)	-	as 36.0 - 41.6 m intervals
44.40	47.00	0.79	McMurray (?)	-	as 36.0 - 36.4 m interval, porous, calcareous quartz sandstone, rounded clear quartz grains (up to 1/2 mm) in limy cement

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APPENDIX 4: CONTINUED

DIAMOND DRILL LOG

Hole ID: 6

Company: ?

Well Name: Synenco 04-104 Firebag 14-21-98-7

Total Depth: 90.89m

Date Logged: April 10-13, 2006

Logged By: W. McGuire and S. Talwar

From (m)	To (m)	Thick. (m)	Formation	Member	Description
74.72	75.47	0.23	McMurray	-	oilsands
75.47	75.84	0.11	McMurray	-	mudstone, medium olive-grey, no fizz
75.84	83.40	2.30	SP (?)	-	lime mudstone, light grey at top grading to darker grey at base, beds at top are perpendicular to core axis, changing slowly to 55° to CA at base
83.40	87.60	1.28	SP (?)	-	lime mudstone, light tan-grey, well bedded, with thin medium brown partings, 80-85° to CA beds, 10 cm intervals at base of collapse breccia
87.60	89.10	0.46	SP (?)	-	lime mudstone, light tan-grey, faintly bedded, 70° to CA beds, partings are tan-brown
89.10	90.89	0.55	SP (?)	-	massive lime mudstone, very light grey, 70°-85° to CA beds, 10-15 cm intervals of brecciated rock near base

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APPENDIX 4: CONTINUED

DIAMOND DRILL LOG

Hole ID: 5
 Company: ?
 Well Name: Synenco 04-120 Firebag 6-21-98-7

Total Depth: 83.60m

Date Logged: April 10-13, 2006
 Logged By: W. McGuire and S. Talwar

From (m)	To (m)	Thick. (m)	Formation	Member	Description
60.60	67.85	2.21	McMurray	-	oilsand to watersand at base
67.85	68.15	0.09	McMurray	-	mudstone, tan-brownish-grey
68.15	76.30	2.48	SP (?)	-	lime mudstone, light-grey, well bedded, beds 80-85° CA, light & darker laminations
76.30	80.30	1.22	SP (?)	-	nodular lime mudstone, tan-grey, very light grey nodules in medium-grey matrix
80.30	83.60	1.01	SP (?)	-	lime mudstone, light grey to pale brown at base, beds ~85° to CA, faintly bedded, similar to 68.15 - 76.30 m interval

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DIAMOND DRILL LOG

Hole ID: 4
 Company: Suncor
 Well Name: Suncor Audet 16-18-98-7

Total Depth: 60.5m

Date Logged: April 10-13, 2006
 Logged By: S. Fraser

From (m)	To (m)	Thick. (m)	Formation	Member	Description
50.50	51.00	0.50	McMurray	-	oil sands
51.00	51.30	0.30	McMurray	-	erosional rounded fragments up to 1 cm, gritty
51.30	51.60	0.30	McMurray	-	missing core
51.60	52.50	0.90	McMurray	-	calcareous mudstone, good bedding at contact 83°-87° to core axis
52.50	60.50	8.00	WW (?)	?	lime mudstones, light grey to olive grey, nodular, compact, moderate to good reaction with HCl

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APPENDIX 4: CONTINUED

DIAMOND DRILL LOG

Hole ID: 1
 Company: Suncor
 Well Name: Suncor Audet 5-32-97-7

Total Depth: 54.2m

Date Logged: April 10-13, 2006
 Logged By: S. Fraser

From (m)	To (m)	Thick. (m)	Formation	Member	Description
33.30	43.45	10.15	McMurray	-	MCM, 0.8 m tar sands at bottom
43.45	44.90	1.45	WW (?)	FB (?)	light grey, massive, partially brecciated, calcareous shale, contact 45° to CA with overlying McMurray
44.90	47.85	2.95	WW (?)	FB (?)	Strongly brecciated, light grey, subangular to subrounded fragments
47.85	52.10	4.25	WW (?)	FB (?)	light grey, bedding is 80-88° to core axis, calcareous shale, highly argillaceous, thinly bedded, bedding thickens 1 mm - 1 cm thickness
52.10	54.20	2.10	WW (?)	FB (?)	light to dark grey, highly argillaceous, fossiliferous, mottled in parts, partly fragmented, nodular, abundant molluscs in parts

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DIAMOND DRILL LOG

Hole ID: 2
 Company: Esso
 Well Name: Esso 82 Oslo OV BSL-78 10-6-98-7

Total Depth: 90.83m

Date Logged: April 10-13, 2006
 Logged By: W. McGuire and S. Talwar

From (m)	To (m)	Thick. (m)	Formation	Member	Description
69.49	76.08	6.59	McMurray	-	oilsand with 10 cm interval of medium tan-grey mudstone at base
76.08	80.90	4.82	WW (?)	?	light grey, well bedded lime mudstone with a few molluscs replaced by calcite, beds ~ 90° to CA
80.90	84.63	3.73	WW (?)	?	nodular lime mudstone, very light grey, nodules in tan grey matrix, mollusc shells replaced by calcite
84.63	90.83	6.20	WW (?)	?	faintly bedded lime mudstone, laminar, light grey

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APPENDIX 4: CONTINUED

DIAMOND DRILL LOG

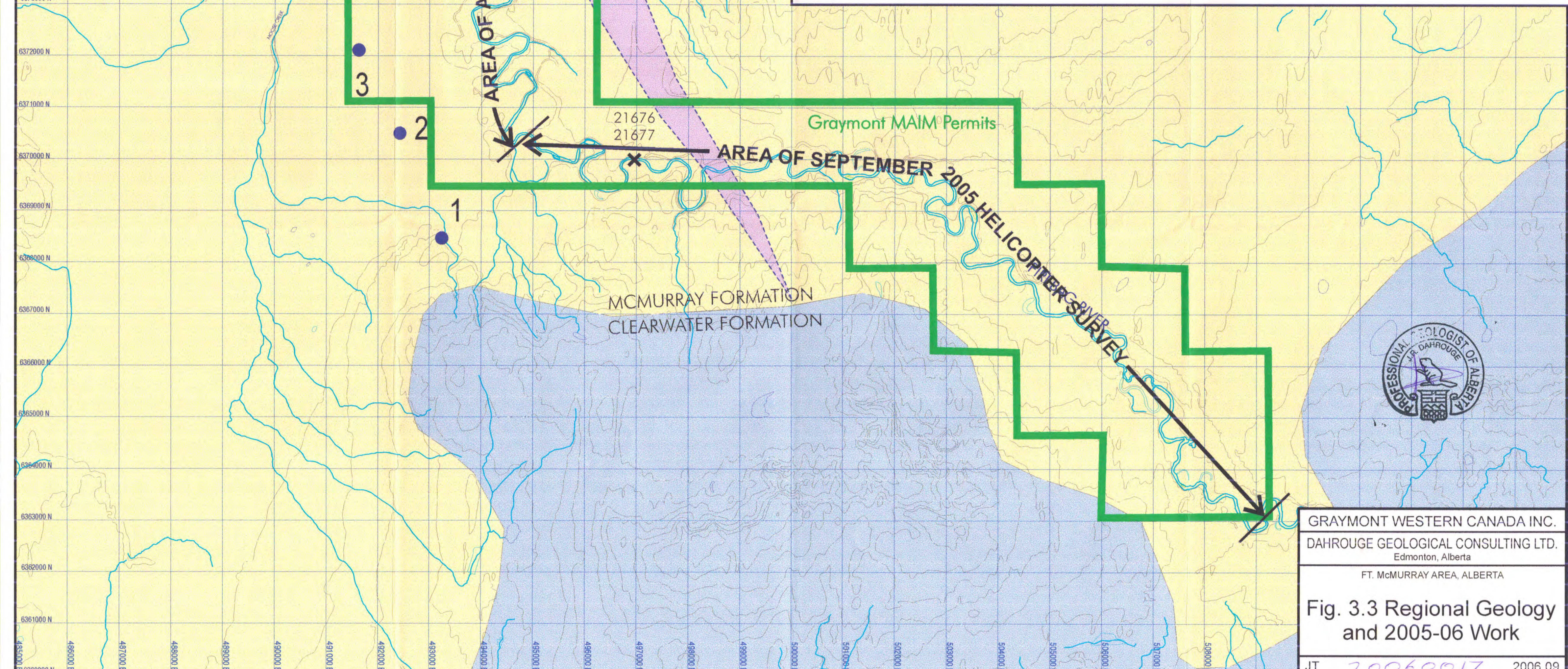
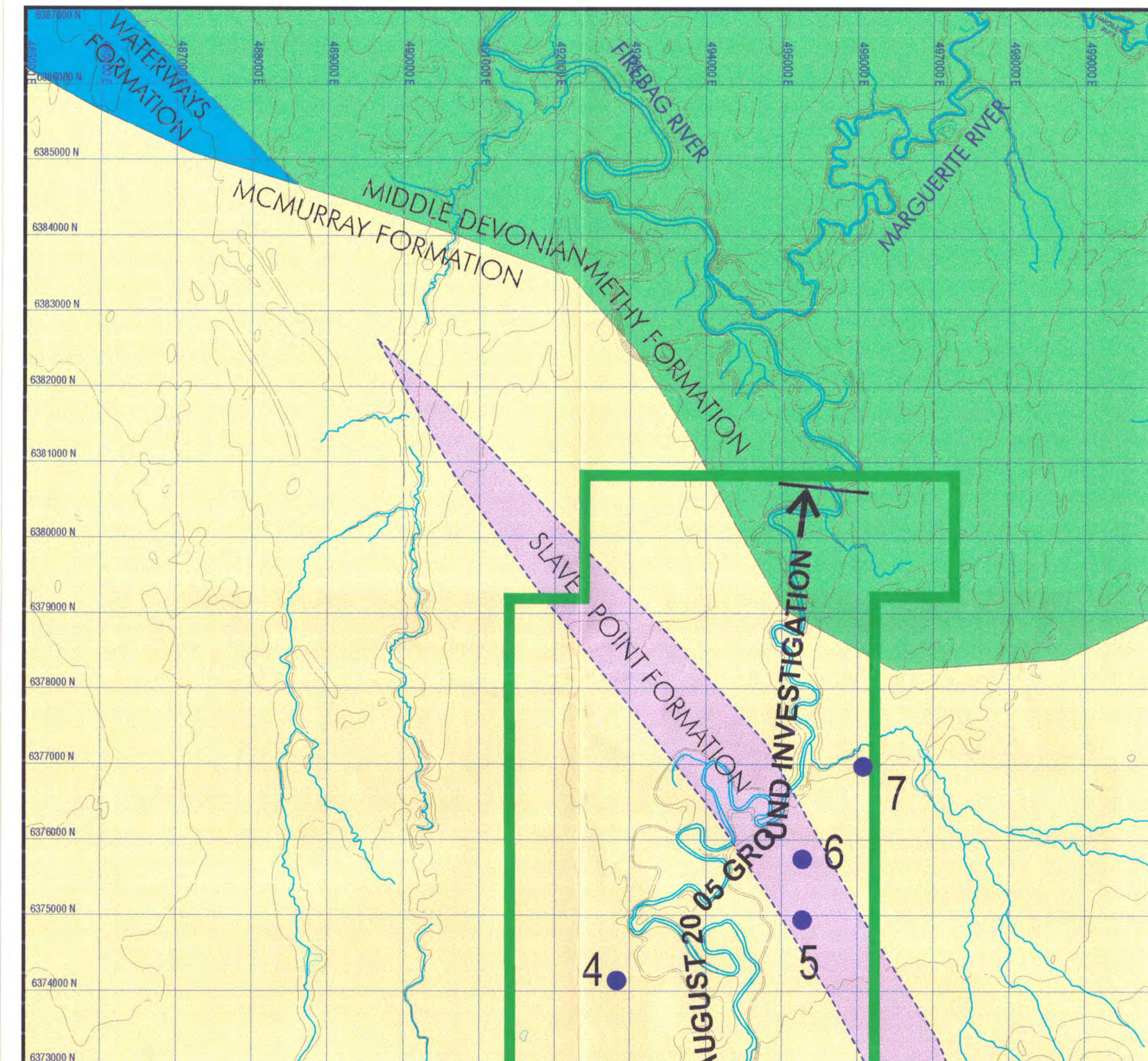
Hole ID: 7
 Company: ?
 Well Name: Synenco 04-077 Firebag 1AA/9-28-98-7

Total Depth: 70.1m

Date Logged: April 10-13, 2006

Logged By: S. Fraser

From (m)	To (m)	Thick. (m)	Formation	Member	Description
55.00	55.48	0.48	McMurray	-	oilsands, lower contact with McMurray at 75-85° bedding to core axis, fine upper sequence, last 15-18 cm is water sand, last 24 cm is mudstone
55.48	62.05	6.57	WW (?)	FB (?)	light grey to grey, highly argillaceous, distinctive bedding at 80° to core axis with shaly partings, minor brecciation in parts
62.05	66.52	4.47	WW (?)	FB (?)	light to dark grey, very fine grained, fragmented in parts with shaly partings, locally abundant molluscs, bedding planes are apparent at 80° to core axis
66.52	70.10	3.58	WW (?)	FB (?)	light to dark grey, progressively more argillaceous, bedding at 80° to core axis, lower 1 m has increasing clay content
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Fig. 3.3 Regional Geology
 and 2005-06 Work

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