ISSN 1916-615X [online]
ISBN 978-1-4435-6292-8 [PDF]

ISSN 1484-9445 [print]
ISBN 978-1-4435-6291-1 [print]

THESE TERMS GOVERN YOUR USE OF THIS DOCUMENT

Your use of this Ontario Geological Survey document (the "Content") is governed by the terms set out on this page ("Terms of Use"). By downloading this Content, you (the "User") have accepted, and have agreed to be bound by, the Terms of Use.

Content: This Content is offered by the Province of Ontario's *Ministry of Northern Development, Mines and Forestry* (MNDMF) as a public service, on an "as-is" basis. Recommendations and statements of opinion expressed in the Content are those of the author or authors and are not to be construed as statement of government policy. You are solely responsible for your use of the Content. You should not rely on the Content for legal advice nor as authoritative in your particular circumstances. Users should verify the accuracy and applicability of any Content before acting on it. MNDMF does not guarantee, or make any warranty express or implied, that the Content is current, accurate, complete or reliable. MNDMF is not responsible for any damage however caused, which results, directly or indirectly, from your use of the Content. MNDMF assumes no legal liability or responsibility for the Content whatsoever.

Links to Other Web Sites: This Content may contain links, to Web sites that are not operated by MNDMF. Linked Web sites may not be available in French. MNDMF neither endorses nor assumes any responsibility for the safety, accuracy or availability of linked Web sites or the information contained on them. The linked Web sites, their operation and content are the responsibility of the person or entity for which they were created or maintained (the "Owner"). Both your use of a linked Web site, and your right to use or reproduce information or materials from a linked Web site, are subject to the terms of use governing that particular Web site. Any comments or inquiries regarding a linked Web site must be directed to its Owner.

Copyright: Canadian and international intellectual property laws protect the Content. Unless otherwise indicated, copyright is held by the Queen's Printer for Ontario.

It is recommended that reference to the Content be made in the following form:

Lichtblau, A.F., Ravnaas, C., Storey, C.C., Bongfeldt, J., McDonald, S., Lockwood, H.C., Bennett, N.A. and Jeffries, T. 2011. Report of Activities 2010, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 6261,93p.

Use and Reproduction of Content: The Content may be used and reproduced only in accordance with applicable intellectual property laws. *Non-commercial* use of unsubstantial excerpts of the Content is permitted provided that appropriate credit is given and Crown copyright is acknowledged. Any substantial reproduction of the Content or any *commercial* use of all or part of the Content is prohibited without the prior written permission of MNDMF. Substantial reproduction includes the reproduction of any illustration or figure, such as, but not limited to graphs, charts and maps. Commercial use includes commercial distribution of the Content, the reproduction of multiple copies of the Content for any purpose whether or not commercial, use of the Content in commercial publications, and the creation of value-added products using the Content.

Contact:

FOR FURTHER INFORMATION ON	PLEASE CONTACT:	BY TELEPHONE:	BY E-MAIL:
The Reproduction of the EIP or Content	MNDMF Publication Services	Local: (705) 670-5691 Toll Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	Pubsales.ndm@ontario.ca
The Purchase of MNDMF Publications	MNDMF Publication Sales	Local: (705) 670-5691 Toll Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	Pubsales.ndm@ontario.ca
Crown Copyright	Queen's Printer	Local: (416) 326-2678 Toll Free: 1-800-668-9938 (inside Canada, United States)	Copyright@gov.on.ca

Ontario

Ontario Geological Survey
Open File Report 6261

Report of Activities, 2010 Resident Geologist Program

Red Lake Regional Resident Geologist Report:

Red Lake and Kenora Districts

2011

Ontario

ONTARIO GEOLOGICAL SURVEY

Open File Report 6261

Report of Activities, 2010
Resident Geologist Program

Red Lake Regional Resident Geologist Report:
Red Lake and Kenora Districts

by

A.F. Lichtblau, C. Ravnaas, C.C. Storey, J. Bongfeldt, S. McDonald, H.C. Lockwood, N.A. Bennett and T. Jeffries

2011

Open File Reports of the Ontario Geological Survey are available for viewing at the John B. Gammon Geoscience Library in Sudbury and at the regional Mines and Minerals office whose district includes the area covered by the report (see below).

Copies can be purchased at Publication Sales and the office whose district includes the area covered by the report. Although a particular report may not be in stock at locations other than the Publication Sales office in Sudbury, they can generally be obtained within 3 working days. All telephone, fax, mail and e-mail orders should be directed to the Publication Sales office in Sudbury. Purchases may be made using cash, debit card, VISA, MasterCard, American Express, cheque or money order. Cheques or money orders should be made payable to the *Minister of Finance.*

John B. Gammon Geoscience Library
933 Ramsey Lake Road, Level A3
Sudbury, Ontario P3E 6B5

Tel: (705) 670-5614

Publication Sales
933 Ramsey Lake Rd., Level A3
Sudbury, Ontario P3E 6B5

Tel: (705) 670-5691(local)
Toll-free: 1-888-415-9845 ext. 5691
Fax: (705) 670-5770
E-mail: pubsales.ndm@ontario.ca

Regional Mines and Minerals Offices:

Kenora - Suite 104, 810 Robertson St., Kenora P9N 4J2

Kirkland Lake - 10 Government Rd. E., Kirkland Lake P2N 1A8

Red Lake - Box 324, Ontario Government Building, Red Lake P0V 2M0

Sault Ste. Marie - 875 Queen Street East, Suite 6, Sault Ste. Marie P6A 2B3

Southern Ontario - P.O. Bag Service 43, 126 Old Troy Rd., Tweed K0K 3J0

Sudbury - Level A3, 933 Ramsey Lake Rd., Sudbury P3E 6B5

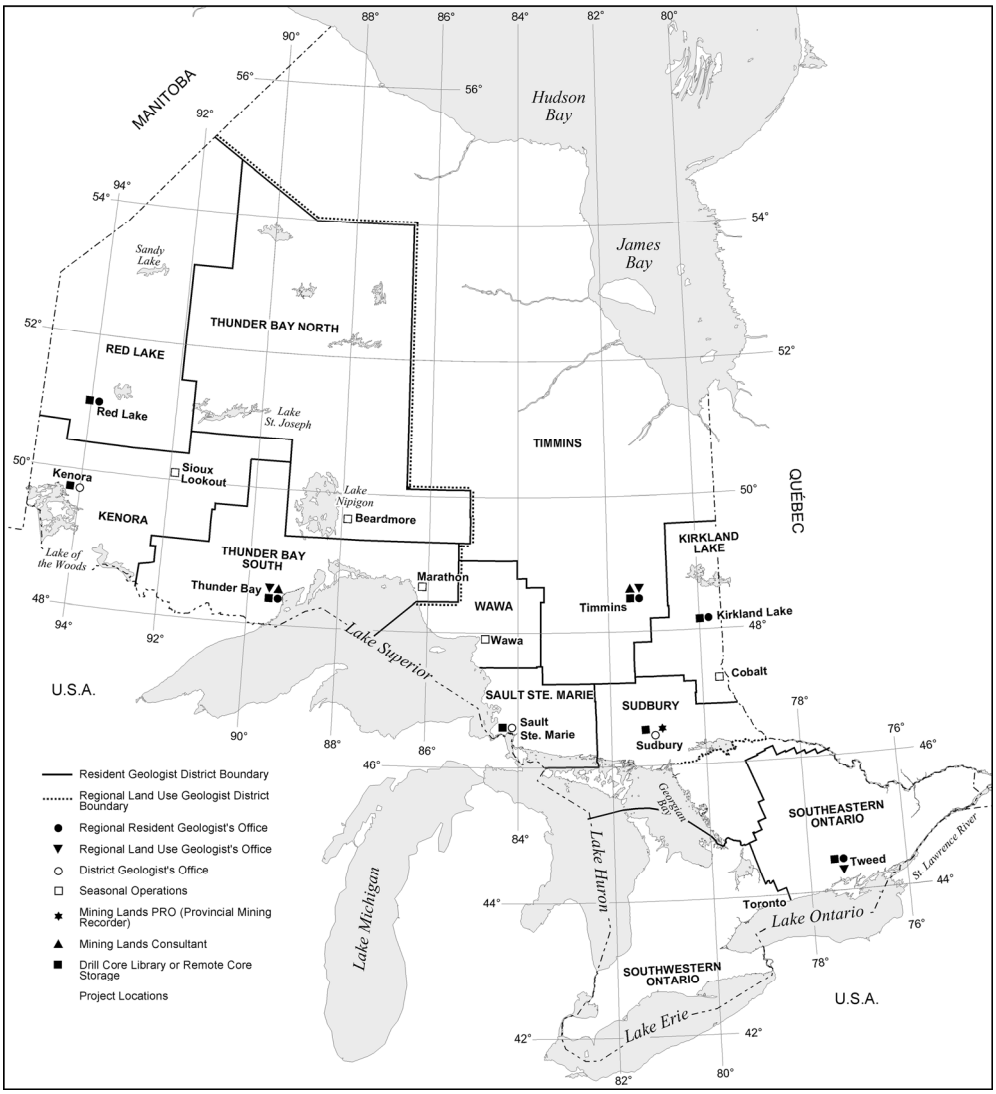
Thunder Bay - Suite B002, 435 James St. S., Thunder Bay P7E 6S7

Timmins - Ontario Government Complex, P.O. Bag 3060, Hwy. 101 East, South Porcupine P0N 1H0

Cette publication est disponible en anglais seulement.

Parts of this report may be quoted if credit is given. It is recommended that reference be made in the following form:

Lichtblau, A.F., Ravnaas, C., Storey, C.C., Bongfeldt, J., McDonald, S., Lockwood, H.C., Bennett, N.A. and Jeffries, T. 2011. Report of Activities 2010, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 6261, 93p.



Mines and Minerals Division Regional and District Offices

CITY	ADDRESS	OFFICE(S)	TELEPHONE	FAX
Kenora	Suite 104, 810 Robertson St., Kenora P9N 4J2	○ ■	(807) 468-2819	(807) 468-2930
Red Lake	227 Howey Street, P.O. Box 324, Red Lake P0V 2M0	● ■	(807) 727-2464	(807) 727-3553
Thunder Bay – North	Suite B002, 435 James St. S., Thunder Bay P7E 6S7	● ■ ▼ ▲	(807) 475-1331 (807) 475-1311	(807) 475-1112 (807) 475-1112
Thunder Bay – South	Suite B002, 435 James St. S., Thunder Bay P7E 6S7	● ■ ▼ ▲	(807) 475-1331 (807) 475-1311	(807) 475-1112 (807) 475-1112
Sault Ste. Marie	Suite 6, 875 Queen St. E., Sault Ste. Marie P6A 2B3	○ ■	(705) 945-6931	(705) 945-6935
Timmins	Ontario Government Bldg., P.O. Bag 3060, 1270 Hwy 101 East, South Porcupine P0N 1H0	● ■ ▼ ▲	(705) 235-1619 (705) 235-1600	(705) 235-1620 (705) 235-1610
Kirkland Lake	10 Government Rd. E., P.O. Box 100, Kirkland Lake P2N 3M6	● ■	(705) 568-4518	(705) 568-4524
Sudbury	Willet Green Miller Centre, Level A3, 933 Ramsey Lake Rd., Sudbury P3E 6B5	○ ▼ ✶	(705) 670-5735 (705) 670-5887 (705) 670-5742	(705) 670-5770 (705) 670-5807 (705) 670-5681
Tweed (Southern Ontario)	P.O. Bag Service 43, 126 Old Troy Rd., Tweed K0K 3J0	● ■ ▼	(613) 478-3161	(613) 478-2873

ONTARIO GEOLOGICAL SURVEY

RESIDENT GEOLOGIST PROGRAM

REPORT OF ACTIVITIES - 2010

RED LAKE REGIONAL RESIDENT GEOLOGIST REPORT

CONTENTS

1. Red Lake District

2. Kenora District

Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Red Lake Regional Resident Geologist (Red Lake District)—2010

by

**A.F. Lichtblau, C.C. Storey, S. McDonald, H.C. Lockwood,
N.A. Bennett and T. Jeffries**

2011

CONTENTS

Red Lake Regional Resident Geologist District—2010

INTRODUCTION 1
MINING ACTIVITY 3
Goldcorp Inc. – Red Lake Gold Mines 3
EXPLORATION ACTIVITY 6
Red Lake Greenstone Belt 17
Goldcorp Inc. 17
Hy Lake Gold Inc. 19
Mega Precious Metals Inc. 20
Premier Gold Mines Ltd. 21
Rubicon Minerals Corporation 21
Birch–Uchi and Confederation Greenstone Belts 23
Gold Canyon Resources Inc. 23
Northern Greenstone Belts 24
RESIDENT GEOLOGIST STAFF AND ACTIVITIES 24
DRILL CORE STORAGE SITE 26
PROPERTY EXAMINATIONS 27
Rare Earth Elements in Granitoid Rocks 28
South Austin Zone 34
RECOMMENDATIONS FOR EXPLORATION 38
Rare Metals 38
Iron 39
Copper-Nickel-Platinum Group Elements 39
Gold in the Dome Stock 39
OGS ACTIVITIES AND RESEARCH BY OTHERS 41
MINERAL DEPOSITS NOT BEING MINED 44
REGIONAL LAND USE GEOLOGIST ACTIVITIES 48
Land Use Planning Activities 48
Crown Lands 48
Municipal/Private Lands 50
Other Activities 50
MINERAL DEPOSIT COMPILATION GEOLOGIST – NORTHWEST ACTIVITIES 50
REFERENCES 51

Tables

1. Mine production and reserves in the Red Lake District in 2010 1
2. Summary of claim status in the Red Lake District, 2010 3
3. Gold production in the Red Lake District to December 31, 2010 5
4. Assessment files received in the Red Lake District in 2010 6
5. Exploration activity in the Red Lake Resident Geologist District in 2010 8
6. Metal production other than gold in the Red Lake District to December 31, 2010 24
7. Drill core stored at the Red Lake Resident Geologist's District Remote Drill Core Compound 26
8. Property visits conducted by the Red Lake Regional Resident Geologist and staff in 2010 27
9. Rare Earth Elements and crustal abundances 28
10. Rock sample locations and descriptions for samples taken during this study at locations with associated lake sediment anomalies 30
11. Major element analyses of selected granitoid rocks sampled during this study 31
12. Rare earth element analyses for samples described in Table 10 32
13. Other trace element analyses for samples described in Table 10 33
14. Trace element analyses of South Austin Tuff samples 36
15. Trace element analyses of QFP and Huston conglomerate samples 37
16. Major element chemistry of all lithologies, South Austin Tuff exposure 38
17. Publications received by the Red Lake Resident Geologist Office in 2010 42
18. Mineral deposits not being mined in the Red Lake District in 2010 44

Figures

1. Annual gold production in the Red Lake belt, 1986–2010 2
2. Average monthly price of gold in 2010 2
3. Red Lake District 14
4. Red Lake District (north part): exploration activity 15
5. Red Lake greenstone belt: exploration activity and active mines 15
6. Eastern Red Lake greenstone belt: exploration activity and active mines 16
7. Birch–Uchi greenstone belt: exploration activity and property examination 16
8. Red Lake greenstone belt: property examinations 17
9. Location of North Madsen properties, Mega Precious Metals Inc., Dome and Heyson townships 20
10. Location of the South Austin Zone 34
11. Detail of stripping and sampling, South Austin Zone 35
12. Location of Dome stock, central Red Lake greenstone belt, and locations mentioned in text 40
13. Location of OGS and other research projects in the Red Lake District in 2010 41

Photos

1. Cochenour–Willans headframe ca. 2007 4
2. Cochenour headframe, December 2010 4
3. Red Lake CIM field trip participants examining outcrop on Red Lake Gold Mines Inc.'s Marboy property 25

Red Lake Regional Resident Geologist (Red Lake District)—2010

A.F. Lichtblau[1], C.C. Storey[2], S. MacDonald[3], H.C. Lockwood[4], N.A. Bennett[5] and T. Jeffries[6]

[1]Regional Resident Geologist, Red Lake–Kenora, Resident Geologist Program, Ontario Geological Survey

[2]District Geologist, Red Lake District, Resident Geologist Program, Ontario Geological Survey

[3]District Geological Assistant, Red Lake District, Resident Geologist Program, Ontario Geological Survey

[4]Northwest Regional Land Use Geologist, Resident Geologist Program, Ontario Geological Survey

[5]Mineral Deposit Compilation Geologist–Northwest, Resident Geologist Program, Ontario Geological Survey

[6]District Administrative Support, Red Lake District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

Gold was the only commodity mined in the Red Lake District in 2010. Annual production of 703 300 ounces Au was up by 13% compared to prior years' production (Table 1, Figure 1).

Exploration and development work on 3 major Advanced Exploration projects in the Red Lake greenstone belt continued throughout 2010: 1) Rubicon Minerals Corp.'s Phoenix Gold Project; 2) Goldcorp Inc.'s Bruce Channel Discovery; and 3) Claude Resources Ltd.'s Madsen Mine project. While most exploration efforts were directed at gold, there is interest in other commodities. Iron returned as an exploration target for the first time in many years, with three properties being explored, including the past producing Griffith Mine. Rare metal pegmatites are still being sought and there are two base metal properties in the Red Lake District, but neither received work during 2010.

Table 1. Mine production and reserves in the Red Lake District in 2010.

Mine	Production in 2009		Production in 2010		Reserves Plus Resources (all categories) at end of 2010	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Goldcorp Canada Ltd. Red Lake Gold Mines (1)	781 700 tonnes @ 26 g/t Au	622 700 ounces Au	876 600 tonnes @ 26 g/t Au	703 300 ounces Au	18 600 000 tonnes	13.7 g/t Au

(1) Goldcorp Canada Ltd., MD&A for the year ended December 31, 2010; accessed on www.sedar.com, February 28, 2011.

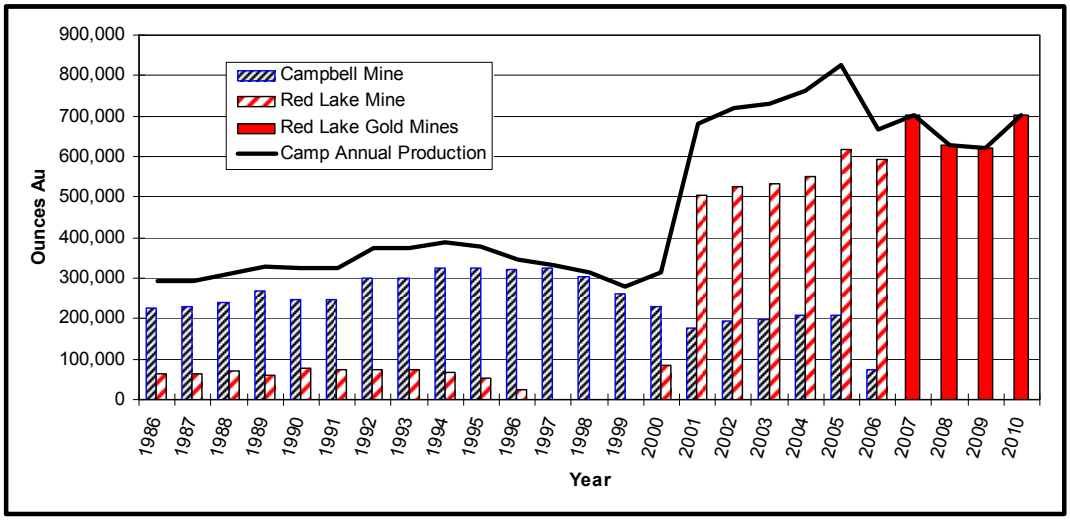


Figure 1. Annual gold production in the Red Lake belt, 1986–2010.
(No production at the Red Lake Mine between 1997 and 1999 due to strike by unionized employees.)

The price of gold increased dramatically beginning in August of 2009 and held above the US$1100 per ounce level from February 2010 to year end (Figure 2). The price showed a steady increase (except for July) until closing at a high of slightly over US$1400 in December 2010 (price information from Web site www.kitco.com).

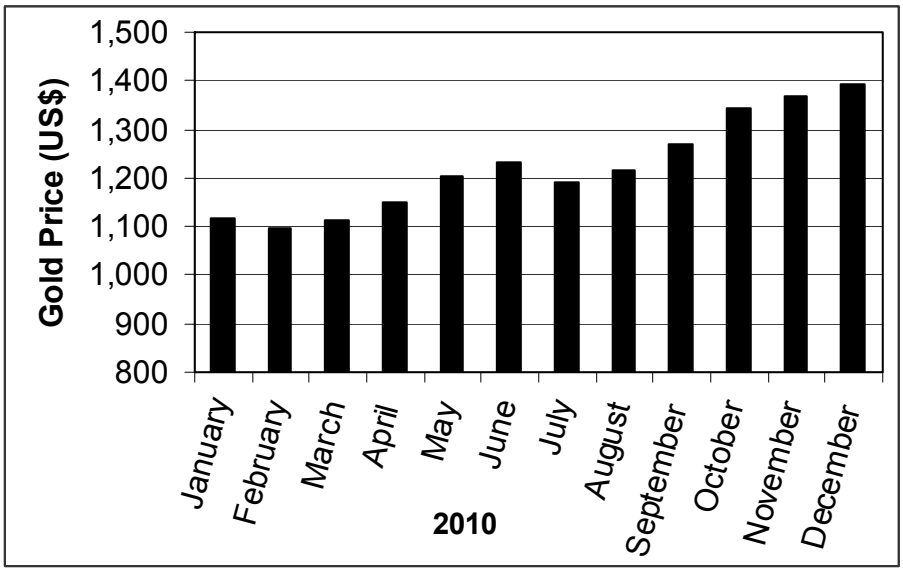


Figure 2. Average monthly price of gold in 2010 (price information from Web site www.kitco.com).

Claim staking activity increased dramatically in 2010 (Table 2), along with the total number of claim units in good standing. The number of cancellations was down 25% relative to 2009. This, along with a 115% increase in the number of recorded units, increased the number of claim units in good standing by 14% over 2009.

During 2010, 73 assessment work and other technical reports were received in the Red Lake Resident Geologist's office (Table 4). The total value of the work received was $24,845,125.00, an increase of almost 36% over 2009 levels.

Table 2. Summary of claim status in the Red Lake District, 2010.

Year	Cancelled (Claim Units)	Recorded (Claim Units)	Active (Claim Units)
2010	3569	6271	22 514
2009	4737	2917	19 816
2008	1921	5008	21 326
2007	1878	4716	18 334
2006	4759	3358	15 436
2005	5165	3117	16 911
2004	3690	2099	18 647
2003	1842	6781	21 127
2002	1795	7689	15 732
2001	290	291	2269

MINING ACTIVITY

Gold production in Red Lake continued unabated at the integrated operations of Goldcorp Canada Ltd.'s Red Lake Gold Mines, comprising the Campbell and Red Lake complexes. Historical statistics for all producers in the district are given in Table 3.

Goldcorp Inc. – Red Lake Gold Mines

Gold production in 2010 of 703 300 ounces at a cash cost of $US297 per ounce, was 3% higher than in 2009 due to a stronger Canadian dollar and slightly higher operating costs, but was offset by higher gold production. The average realized gold price was $US1233 per ounce.

The company's growth scenario envisions ultimate annual production of 1 million ounces of gold. Mill feed from the Bruce Channel deposit ("BCD"), when fully developed, could make up to 1/3 of total production; inferred resources stand at 7.61 million tonnes at a grade of 11.04 g/t Au (Goldcorp Inc., news release, February 9, 2011). The construction of the 5-kilometre-long high-speed haulage drift to connect Cochenour–Willans infrastructure with the Red Lake mine on the 5400 foot level has advanced approximately 1 km. Upon completion, the drift will enable ore from the Cochenour/Bruce Channel deposit to be hauled directly to the Red Lake mine for processing, commencing near the end of 2014. It is anticipated that the deposit will yield approximately 285 000 ounce Au per year (Goldcorp Inc., Canadian Asset Tour Presentation, September 13-15, 2010).

Enlarging and upgrading of the Cochenour shaft and headframe continued throughout the year. At year-end the shaft was dewatered to approximately the 2250 foot level. During 2011, dewatering and enlarging the shaft to an 18 foot (~5.5 m) diameter will continue to the 2800 foot level. Bottom of shaft is anticipated to be at the 3450 foot level. Most of the work to year end was on the surface infrastructure.

The original Cochenour–Willans headframe dates from the late 1930s. Production ceased in 1971, after 2.3 million tons were mined to produce 1.24 million ounces Au, at a grade of 0.54 opt Au. A total of $71 million was budgeted for the Cochenour Project (including an internal feasibility study) for 2010 (Goldcorp Inc., news release, March 11, 2010).

During 2011, exploration drilling from the high-speed tram drift will continue to test the unexplored ground at depth in the heart of the prolific Red Lake "mine trend", and pass through a portion of, or in close proximity to, the Goldcorp Inc.–Premier Gold Mines Limited Rahill–Bonanza joint venture property.

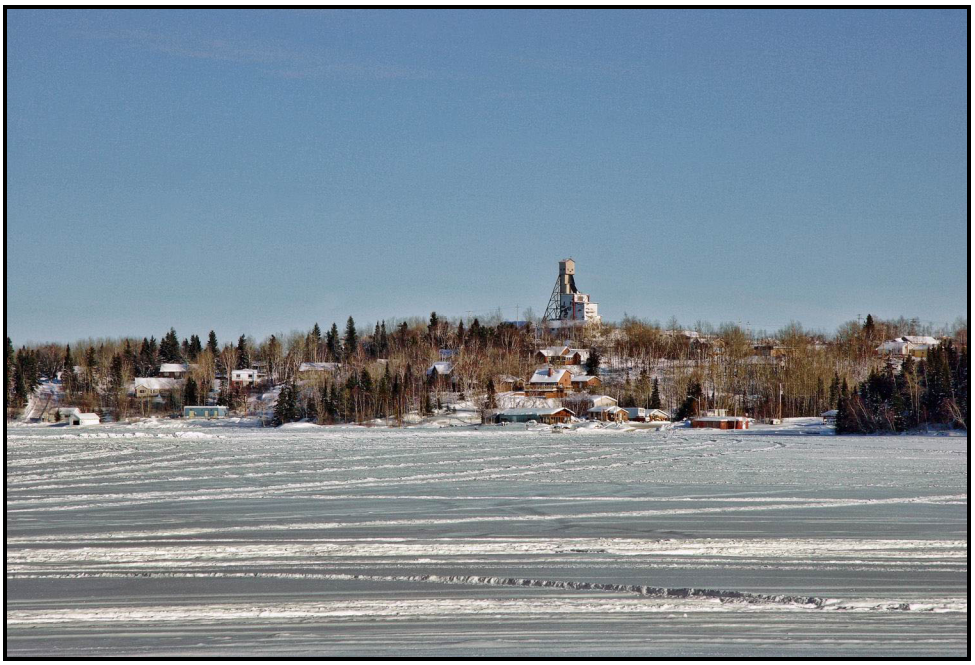


Photo 1. Cochenour–Willans headframe ca. 2007 (photo courtesy Don Nord, photo_dude46@yahoo.ca).

Photo 2. Cochenour headframe, December 2010 (photo courtesy Don Nord, photo_dude46@yahoo.ca).

Reserve and resource estimates for the Red Lake Gold Mines as of December 31, 2010 are listed below (Goldcorp Inc., news release, February 9, 2011).

Category	Tonnes	Grade (g/t Au)	Contained Ounces Au
Proven and Probable Reserves	9 930 000	12.89	4 120 000
Measured and Indicated Resources	5 440 000	13.90	2 360 000
Subtotal	*15 370 000*	*13.11*	*6 480 000*
Inferred Resources	3 230 000	16.77	1 740 000
Total all categories	**18 600 000**	**13.74**	**8 220 000**

At year-end 2010, the mine had 928 permanent employees and 423 contract staff on site; the Cochenour project had a compliment of 233 individuals. Mike Lalonde was Mine Manager.

Table 3. Gold production in the Red Lake District to December 31, 2010.

Mine	Years of Production	Ore Milled (Short Tons)	Gold Produced	
			Troy Ounces	Ounces per Ton
Red Lake Gold Mines	2006–present[1]	3 872 040	3 248 690	0.839
Campbell Mine	1949–2006[2]	19 944 241	11 216 443	0.564
Goldcorp (Dickenson)	1948–2006[3]	9 606 894	5 962 948	0.621[4]
Madsen	1938–1976, 1997[5]–1999	8 678 143	2 452 388	0.283[6]
Cochenour–Willans	1939–1971	2 311 165	1 244 279	0.538[7]
McKenzie Red Lake	1935–1966	2 353 833	651 156	0.277
Howey	1930–1941, 1957[8]	4 630 779	421 592	0.091[9]
Hasaga	1938–1952	1 515 282	218 213	0.144
Starratt Olsen	1948–1956	907 813	163 990	0.181
Berens River	1939–1948	560 607	157 341	0.281
Uchi	1939–1943	757 074	114 467	0.151
Jason (Argosy)	1934–1952	276 573	101 875	0.368
H.G. Young	1960–1963	288 179	55 244	0.192
Sachigo River	1938–1941	46 457	52 560	1.131
McMarmac	1940–1948	152 978	45 246	0.296
Gold Eagle	1937–1941	180 095	40 204	0.223
Jackson Manion	1934–1940	105 357	27 142	0.258
Red Lake Gold Shore	1936–1938	86 333	21 100	0.244
Hudson Patricia	1936–1937	11 228	1857	0.165
Buffalo	1981–1982	31 986	1656	0.052
Abino	1985–1986	2733	1397	0.511
Lake Rowan	1986–1988	13 023	1298	0.100
Mount Jamie	1976	972	377	0.388
Kostynuk Brothers	1963–1966	577	1126	1.951
Bobjo	1929	N/A	362[10]	N/A
Bathurst	1927–1937	562	307	0.546
Red Summit	1935–1936	591	277	0.469
Sol d'Or	1933–1936	458	258	0.563
McFinley	1987	N/A	N/A	N/A
TOTAL		**56 335 973**	**26 203 793**	**0.465**

Notes:
(1) Includes total production from the Red Lake complex from January 1, 2006, and production from the Campbell complex subsequent to May 12, 2006, the date of acquisition.
(2) Includes production figures under Placer Dome (CLA) Ltd., to May 12, 2006.
(3) For 1997, 1998 and 1999, no production due to strike by unionized employees.
(4) From 1970, includes production from Robin Red Lake.
(5) Includes clean up of ore and materials from the mine site.
(6) Historic grade, actual grade for 1999 was 0.14 ounce per ton gold.
(7) Includes production from Annco and Wilmar properties.
(8) Continuous production 1930 to 1941; includes 268 ounces recovered from clean up in 1957.
(9) The ore mined at Howey, before sorting, totalled 5 158 376 tons. The average production from run-of-mine ore was therefore 0.0817 ounce per ton gold.
(10) Not included in total production figure.
N/A Data not available.

EXPLORATION ACTIVITY

Assessment work received by the Red Lake Resident Geologist's office is listed in Table 4, and a summary of exploration activity is given in Table 5. The exploration industry staged a come-back in terms of work on the ground and the increased ability of securing financing. Gold prices increased through 2010 from US$1118 in January to US$1391 in December. Continued exploration successes by Rubicon Minerals Corporation and Goldcorp Inc. have supported continued interest in the Red Lake gold camp. Base metal prices have also steadily increased throughout 2010, giving support to that exploration sector as well.

Table 5 lists the companies and individuals who reported some activity on their property during 2010; several are described in more detail in the following pages. Programs with significant exploration expenditures and/or significant known results, and properties whose location is of particular strategic or geologic interest are described. Information included in this section is taken from assessment files in the Red Lake Resident Geologist's office, unless otherwise indicated. Programs are keyed to Table 5 and Figures 3, 4, 5, 6, 7 and 8.

Table 4. Assessment files received in the Red Lake District in 2010.

Abbreviations

AEM	Airborne electromagnetic survey	IP	Induced polarization survey
AM	Airborne magnetic survey	Lc	Linecutting
ARA	Airborne radiometric survey	MMI	Mobile Metal Ion™ soil sampling survey
Beep	Beep Mat survey	OD	Overburden drilling
Bulk	Bulk sampling	ODH	Overburden drill hole(s)
DD	Diamond drilling	PEM	Pulse electromagnetic survey
DDH	Diamond drill hole(s)	PGM	Platinum group metals
DGP	Down-hole geophysics	Pr	Prospecting
GC	Geochemical survey	RES	Resistivity survey
GEM	Ground electromagnetic survey	Samp	Sampling (other than bulk)
GL	Geological survey	Seismic	Seismic survey
GM	Ground magnetic survey	SP	Self-potential survey
GRA	Ground radiometric survey	Str	Stripping
Grav	Gravity survey	Tr	Trenching
HLEM	Horizontal loop electromagnetic survey	UG	Underground exploration/development
HM	Heavy mineral sampling	VLEM	Vertical loop electromagnetic survey
IM	Industrial mineral testing and marketing	VLFEM	Very low frequency electromagnetic survey

Township/Area	Company Filing	Year	Work Performed	AFRO Number	Credits Applied	RL File Number
Avis Lake Area	Lion Energy Corp.	2010	Technical Report	Non-assessment	$0.00	RL3307
Avis Lake Area	Amador Gold Corporation	2009	DD, Assay	2.45145	$277,533.00	RL3333
Avis Lake Area	Raytech Mining Corporation	2008	DD, Assay, GM, Metallurgical study	2.45491	$733,654.00	RL3364
Baird Township	Goldcorp Inc.	2008	DD, Samp, Assay	2.44599	$434,568.00	RL3371
Ball Township	Halo Resources Ltd.	2008	Samp	2.42747	$2,010.00	RL3278
Ball Township	Halo Resources Ltd.	2010	DD, Assay	2.45734	$34,510.00	RL3353
Ball Township	John Scott Franko	2010	Pr, Samp	2.45808	$3,731.00	RL3359
Ball Township	Halo Resources Ltd.	2009	Pr, Samp, GL	2.43873	$48,850.00	RL3367
Ball Township	Halo Resources Ltd.	2009	Str, Tr, Samp, Assay	2.45735	$60,946.00	RL3378
Balmer Township	Mega Precious Metals	2009	Assay, DD	2.44085	$180,575.00	RL3316
Balmer Township	Rubicon Minerals Corporation	2008	Assay, DD	2.44762	$601,720.00	RL3324
Balmer Township	Rubicon Minerals Corporation	2008	Assay, DD	2.44597	$217,638.00	RL3325
Bateman Township	Goldcorp Inc.	2009	DD, assay	2.42806	$540,738.00	RL3276
Bateman Township	Dominion Goldfields Corp.	2008	DD, Assay	2.43946	$1,320,025.00	RL3298
Bateman Township	Rubicon Minerals Corporation	2008	Assay, DD	2.44603	$128,427.00	RL3321

Township/Area	Company Filing	Year	Work Performed	AFRO Number	Credits Applied	RL File Number
Bateman Township	Rubicon Minerals Corporation	2005	Assay, DD	2.44624	$34,265.00	RL3322
Bateman Township	Crown Minerals Inc.	2010	Technical Report	Non-assessment	$0.00	RL3341
Bateman Township	Rubicon Minerals Corporation	2008	DD, Assay	2.44875	$1,281,477.00	RL3363
Bearskin Lake Area	Escape Gold Inc.	2008	Technical Report	Non-assessment	$0.00	RL3304
Belanger Township	Tribute Minerals Corporation	2009	DD, Assay	2.43686	$585,780.00	RL3301
Belanger Township	Tribute Minerals Corporation	2007	DD, Assay	2.43091	$51,196.00	RL3306
Belanger Township	Tribute Minerals Corporation	2007	DD, Assay	2.46359	$35,242.00	RL3361
Belanger Township	Tribute Minerals Corporation	2010	DGP	2.4623	$28,295.00	RL3362
Belanger Township	English, Perry Vern	2010	IP, Lc, DGP	2.4592	$83,314.00	RL3365
Belanger Township	Tribute Minerals Corporation	2007	DGP	2.46244	$42,406.00	RL3366
Byshe Township	Diamine Exploration Inc.	2009	GEM	2.45135	$27,112.00	RL3332
Casummit Lake Area	Mega Precious Metals	2009	Samp, Assay	2.45649	$29,310.00	RL3372
Coli Lake Area	Goldcorp Inc.	2008	Assay, DD	2.43714	$2,542,361.00	RL3314
Dent Township	Tribute Minerals Corporation	2009	Lc, GEM	2.43119	$207.00	RL3300
Dent Township	Tribute Minerals Corporation	2009	Pr	2.43119	$1,547.00	RL3305
Dent Township	Hilltown Resources Inc.	2010	Pr, Samp, Assay	2.45429	$20,259.00	RL3377
Dixie Lake Area	Trueclaim Resources Inc.	2008	DD	2.4361	$215,205.00	RL3315
Dome Township	Goldcorp Inc./Premier Gold Mines Ltd.	2008	DD, Assay	2.43477	$5,282,306.00	RL3281
Dome Township	Goldcorp Inc.	2008	DD, Assay	2.43604	$5,308,473.00	RL3299
Dome Township	Premier Gold Mines Ltd.	2009	Technical Report	Non-assessment	$0.00	RL3302
Dome Township	Global Minerals Ltd.	2007	Technical Report	Non-assessment	$0.00	RL3303
Dome Township	Goldcorp Inc.	2009	DD, Assay	2.44933	$1,373,774.00	RL3331
Dome Township	Goldcorp Inc.	2010	DD	2.4504	$57,316.00	RL3334
Dome Township	Mega Precious Metals	2010	Technical Report	Non-assessment	$0.00	RL3342
Dome Township	Mega Precious Metals	2010	DD, Assay	2.54024	$119,042.00	RL3343
Dome Township	Goldcorp Inc.	2009	DD, Samp	2.45551	$554,220.00	RL3360
Dome Township	Goldcorp Inc.	2010	Assay, GC	2.46012	$2,899.00	RL3376
Fairlie Township	Sedex Mining Corp.	2008	Assay, DD	2.44417	$216,100.00	RL3323
Gerry Lake Area	Precambrian Ventures Ltd.	2009	MMI	2.44856	$2,030.00	RL3339
Gerry Lake Area	Precambrian Ventures Ltd.	2009	MMI	2.45638	$8,052.00	RL3340
Hewitt Lake Area (S part North Spirit Lake)	HTX Minerals Corp.	2008, 2009	Pr, Samp, Assay, GL	2.46449	$56,967.00	RL3375
Heyson Township	East West Resources Corporation	1995-1996	IP, VLFEM, Samp, Assay, DD	Non-Assessment	$0.00	RL3329
Heyson Township	East West Resources Corporation	1995-1996	DD, Samp, IP, VLF	Non-Assessment	$0.00	RL3330
Joyce River Area	Frank, Raymond Arthur	2009	Pr, Str, Samp, Assay	2.44731	$6,654.00	RL3369
Mitchell Township	Meyer, Claus Martin, Gerhard	2009	Pr, Samp, Assay, GL	2.43759	$13,435.00	RL3368
Mulcahy Township	Puget Ventures Inc.	2008	DD, Samp	2.42689	$680,787.00	RL3275
Narrow Lake Area	Jerold Milton Williamson	2008	Assay, DD	2.43164	$81,677.00	RL3317
Pringle Lake Area	Agnico-Eagle Mines Ltd.	2009	Assay, GC	2.44161	$273,828.00	RL3318
Root Lake Area	Watts, Harold A.	2009	Pr, Str, Tr	2.43973	$15,677.00	RL3392

Township/Area	Company Filing	Year	Work Performed	AFRO Number	Credits Applied	RL File Number
Satterly Lake Area	Northern Mineral Exploration Services/Zorin Industries Inc.	2009	Pr, Samp, Assay	2.43521	$33,868.00	RL3282
Satterly Lake Area	Lateegra Gold Corp.	2010	Pr, Samp, MMI	2.46395	$40,092.00	RL3373
Setting Net Creek Area	Shoreham Resources Ltd.	2010	AM, AEM, DD	2.44812	$198,838.00	RL3338
Skinner Township	Sabina Gold and Silver Corp.	2009	DD, Assay	2.43445	$276,065.00	RL3297
Slate Lake Area	North American Uranium	2010	IP	2.44937	$14,925.00	RL3370
South of Otter Lake Area	Tri Origin Exploration Ltd.	2009	DD, Assay	2.43704	$232,602.00	RL3296
South of Otter Lake Area	Precambrian Ventures Ltd.	2009	Assay, GC	2.44283	$15,051.00	RL3319
Thorne Lake Area	Northern Superior Resources	2009	Gl, Samp, Pr	2.4323	$292,363.00	RL3279
Todd Township	Hy Lake Gold Inc.	2007-2008	DD, Assay	2.42706	$153,402.00	RL3277
Todd Township	Perry Vern English	2007	Assay, GC	2.44351	$5,010.00	RL3320
Todd Township	Amador Gold Corporation	2009	DD, Samp, MMI	2.44865	$95,175.00	RL3354
Willans Township	Murgor Resources Inc.	2010	AEM, AM	2.43874	$41,596.00	RL3374

Table 5. Exploration activity in the Red Lake Resident Geologist District in 2010.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
Comp ..... Compilation
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
MD&A ..... Management Discussion and Analysis
MMI ..... Mobile Metal Ion™ soil sampling survey
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
1	Amador Gold Corp. (AGX) (Maskooch Lake Property)	Avis Lake Area (Au, Cu-Pb-Zn)	DDH(5)=1580 m Priority target includes a 10 m wide shear zone with past assays of up to 16 g/t Au (AGX, MD&A for the period ending January 31, 2010, amended April 26, 2010).
2	AMB Development Corporation (Birch Lake Area properties)	Corless, Dent, Goodall, Skinner and Knott townships (Au)	Pr, Samp

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
3	Big Bear Mining Corp. (Sol d'Or and Stevens Lake properties)	Honeywell and Goodall townships (Au)	Comp Optioned 9 claims totaling 4104 acres and 3 claims totaling 96 acres, respectively, from Perry English for Rubicon Minerals (Form 8k, USSC, April 14, 2010).
4	Champlain Resources Inc. (CPL) (Laird Lake Gold Project)	Killala Township and Medicine Stone Lake Area (Au)	Samp, Pr, GL, Comp High grade gold samples up to 75.9 g/t Au collected from "Pit Zone". Laird Lake #2 showing assays 9.33 g/t Au. Anomalous gold values collected up to 2.96 g/t Au over a 3.5 km strike length in SW section of claims.
5	Claude Resources Inc. (CRJ) (Madsen Mine Project)	Baird Township (Au)	DDH(36)=20 511 m, in 4 areas: Aiken Russet, Austin, McVeigh and Starratt-Olsen. UG: Dewatered past 16th level of Madsen Mine shaft. Rehabilitation of 16th level; with 2 drill chambers expected to be developed by end of first quarter 2011. Exploration drilling focused on testing the extension of the Austin Tuff east of the Madsen Shaft, the depth continuity of the Starratt-Olsen Deposit and the depth continuity of the McVeigh Tuff (CRJ, MD&A for the period ending September 30, 2010-released November 5, 2010).
6	Conquest Resources Limited (CQR) (Alexander Gold Project)	Balmer Township (Au)	DDH(7, including wedges)=9030 m, Tr Targets include the Balmer Assemblage at depth, and near surface Sulphide Shear Zone. Hole CR-10-42 intersected 4.64 g/t Au over 6.0 m. Pyrrhotite, As, Zn mineralized silicified shear zone in Balmer Assemblage, assays pending (CQR, news release, December 9, 2010).
7	Crown Gold Corporation (CWM) (McKenzie Island Property)	Dome Township (Au)	DDH(10)=661 m, Tr, Samp Tested the down dip extension, along 100 m strike, where channel samples of an exposed quartz vein system assayed up to 122 g/t Au over 0.5 m, with most samples falling between 3.2 g/t Au and 30.7 g/t Au over widths between 0.32 to 0.75 m. The quartz vein lies along the western contact of a NNW-striking mafic dyke that cuts the Dome granodiorite stock. Eight holes intersected quartz veining down dip to approximately 75 m (CWM, news release, November 17, 2010). Crown Minerals Inc. and Gold Summit Corporation amalgamated to form Crown Gold Corporation (CWM, news release, September 16, 2010).
8	Cypress Development Corp. (CYP) and Skyharbour Resources Ltd. (SYH) (Broulan Reef Property)	Dome Township (Au)	DDH(3, includes 2 wedge-offs)=4355 m Hole BR-09-02 intersected 1.62 g/t Au over 18.0 m, including 2.5 g/t Au over 9.0 m and 5.04 g/t Au over 2.0 m, at a depth of 2815 m (CYP, SYH, news release, May 11, 2010).

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
9	Frank, Ray (Joyce River Claim)	Joyce River Area (base metals)	Pr, Tr, Samp
10	God's Lake Resources Inc. (GLR) (Sherman Lake Gold Project)	Aljo and Levitt Lake areas (Au)	Comp Company acquired 182 claim units adjacent to its past-producing Sachigo River Mine property (GLR, news release, December 17, 2010).
11	Gold Canyon Resources Inc. (GCU) (Springpole Lake Gold Property)	Casummit Lake Area (Au)	DDH(29)=10 300 m Drilling targeted a 1200 m long, 300 m wide NW-trending near-surface (<200 m depth) zone of gold mineralization. Results include 217.0 m @ 1.57 g/t Au and 123 m @ 1.45 g/t Au in hole SP10-007 (see "Gold Canyon Resources Inc." write-up in the "Birch–Uchi and Confederation Greenstone Belts" section of "Exploration Activity").
12	Goldcorp Inc. (G) (Bruce Channel Deposit)	Dome Township (Au)	DD
13	Goldcorp Inc. (G) (Cochenour Project)	Dome Township (Au)	DD
14	Goldcorp Inc. (G) / Premier Gold Mines (PG) (Rahill-Bonanza Property)	Dome Township (Au)	DD
15	Goldcorp Inc. (G) / Premier Gold Mines (PG) (East Bay Project)	Bateman Township (Au)	DDH(5)
16	Golden Dory Resources Corporation (GDR) (Root Lake Lithium Property)	Root Lake Area (rare metals)	Samp Chip sample from trench 3 returned 2.52% Li_2O with 122 g/t Be, 70 g/t Ga, 154 g/t Ta, 217 g/t Cs and 2720 g/t Rb over 2.5 m (GDR, news release, January 25, 2010).
17	Golden Share Mining Corp. (GSH) (Berens River Gold/Base Metal Project)	Setting Net Lake Area (Au, Ag)	Samp, Comp Golden Share acquired the past producing Berens River property through the takeover of Nanoose Gold Limited (GSH, news release, October 28, 2010).
18	Halo Resources Ltd. (HLO) (West Red Lake properties)	Ball Township (Au)	Pr, Samp DDH(1 deepening)=104 m on Tribute Minerals Corporation JV property; intersected 68 g/t Au over 0.41 m (HLO, news release, June 4, 2010). Pr, Samp DDH(12)=1797 m on Goldcorp Inc. JV property; highest grade intersection reported was 18.8 g/t gold over 0.8 m in hole NGI 10-31, the hole furthest to the east and north of Galena Island. Other holes intersected broad zones highly anomalous in gold. Hole EBL10-027 intersected a 57.98 m wide zone with an average grade of 146 ppb Au and hole EBL10-029 intersected a zone 22.01 m wide with an average grade of 629 ppb Au (HLO, news release, January 20, 2011).

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
19	Larry Herbert (Dixie Lake Property)	Dixie Lake Area (Au)	Pr, Samp, Tr
20	Hilltown Resources Inc. (HLT) (Jackson-Manion North Property)	Dent Township (Au)	Samp, GC, GL Grab samples range from >1.0 g/t Au to 4.2 g/t Au; humus samples did not exceed 5 ppb Au.
21	Hy Lake Gold Inc. (HYL) (Rowan Lake Mine Property)	Newman-Todd Township (Au)	DDH(9)=2656 m Expansion of the Rowan Zones to the east: hole HYR-10-27 intersected 168.34 g/t Au over 0.50 m within a wider zone of 42.44 g/t Au over 2.0 m. Rowan-NT Zone intersected 26.4 g/t over 0.50 m within a wider zone of 7.28 g/t Au over 2.0 m (HYK, news release, November 2, 2010). (See "Hy Lake Gold Inc." write-up in the "Red Lake Greenstone Belt" section of "Exploration Activity".)
22	Laurentian Goldfields Ltd. (LGF) (Goldpines Property)	Longlegged Lake, Camping Lake, Cabin Lake and Gould Lake areas (Au)	AEM (7184 line-km), Samp, GC The 4 by 2 km Pakwash Lake anomaly was defined by detailed lake sediment sampling on a 100 by 22 m spaced sample grid and is characterized by elevated Au and Sb values, flanked by a larger As halo. Of 484 samples that define the anomaly, 215 ran greater than 100 ppb Au, with values up to 843 ppb Au (LGF, news release, November 16, 2010).
23	Mainstream Minerals Corporation (MJO)/Premier Gold Mines Limited (PG) (Bobjo Mine Project)	Earngey and Agnew townships (Au)	DDH(4), AM, AEM, Samp Relogging and sampling of core from previous diamond drilling by King's Bay Gold Corp. (MJO, news release, February 11, 2010). Mainstream obtained 100% ownership of the Bobjo Mine Project in June (MJO, news release, June 16, 2010). Mainstream entered an agreement with Premier Gold Mines Ltd. on the Bobjo Project in October (MJO, news release October 14, 2010). Premier can earn up to a 70% interest pending due diligence diamond drilling. Premier Gold Mines Ltd. carried out a 4 hole diamond drill program. Airborne magnetic and electromagnetic surveys were completed over the entire property (MJO, news release, November 26, 2010).
24	Mainstream Minerals Corporation (MJO) (Hazard Lake/Northgate Property)	Earngey Township (Au)	Engaged Burgoyne Geological Inc. to complete a detailed Technical Evaluation Report on the property (MJO, news release, January 25, 2010).
25	Mainstream Minerals Corporation (MJO) (Slate Lake Property)	Slate Lake Area (Au)	MMI Acquisition of 9 claim blocks in Slate Lake Property (MJO, news release, October 20, 2010). MMI soil sampling survey to be completed on Slate Lake property (MJO, news release, November 4, 2010).

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
26	Mega Precious Metals Inc. (MGP) (Headway Gold Property)	Balmer Township (Au)	DDH(2)=3961 m (See "Mega Precious Metals Inc." write-up in the "Red Lake Greenstone Belt" section of "Exploration Activity".)
27	Mega Precious Metals Inc. (MGP) (North Madsen properties)	Heyson Township (Au)	DDH(67)=15 942 m, AEM, AM (See "Mega Precious Metals Inc." write-up in the "Red Lake Greenstone Belt" section of "Exploration Activity".)
28	MetalCorp Limited (MTC) (Black Bear Property)	Sidace Lake Area (Au)	MMI, IP, GM (MTC, news release, November 30, 2010.)
29	Metals Creek Resources Corp. (MEK) (Panama Lake Property)	Slate Lake Area (Au)	Pr, Samp (MEK, news release, September 1, 2010.) Prospecting targeted historic gold assay results. Surface grab samples ranging from 0.005 g/t to 13.33 g/t Au within a quartz flooded zone of approximately 4.5 m in width and traced for over 450 m.
30	Newcastle Resources Ltd. (NCSLF) (Lennie Property)	Balmer Township (Au)	Premier Gold Mines terminated its option on the property (NCSLF, news release, April 7, 2010).
31	Northern Iron Corp. (Griffith Iron Mine)	Bruce Lake Area (Fe)	DDH(1)=429 m, GL, Samp, GM
32	Northern Iron Corp. (Karas Lake)	Karas Lake Area (Fe)	DDH(1)=193 m, GL, Samp, GM
33	Northern Iron Corp. (Whitemud Lake Property)	Whitemud Lake Area (Fe)	DDH(1), GL, Samp, GM
34	Northern Superior Resources Ltd. (SUP) (Meston Lake Property)	Hanson River, Francois Lake, Winters Lake and Mathews Lake areas (Au)	Pr, Samp (SUP, MD&A for period ending September 30, 2010, released November 17, 2010.)
35	Northern Superior Resources Ltd. (SUP) (Rapson Bay Property)	Rapson Bay and Stull Lake areas (Au)	Pr, Samp (SUP, MD&A for period ending September 30, 2010, released November 17, 2010.)
36	Premier Gold Mines Limited (PG) (Redgold Project)	Earngey Township (Au)	Property acquisition (PG, news release, October 14, 2010). (See "Premier Gold Mines Limited" write-up in the "Red Lake Greenstone Belt" section of "Exploration Activity".)
37	Redstar Gold Corp. (RGC)/Central Resources Corp. (Newman–Todd Property)	Todd Township (Au)	DDH(6)=2467.5 m Hole NT-055 intersected 24.0 g/t Au over 1.0 m, NT-053 intersected 11.6 g/t Au over 0.50 m (RGC, MD&A for the period ended September 30, 2010, released November 16, 2010). Central Resources will not proceed with the option on the Newman–Todd project. Redstar has regained a 100% interest in the property (RGC, news release, November 17, 2010). Redstar has granted Confederation Minerals Inc. an option to acquire up to 70% of their Newman–Todd gold project (CFM, news release, November 22, 2010).

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
38	Rubicon Minerals Corporation (RMX) (Phoenix Gold Project)	Bateman Township (Au)	DDH(315)=155 114 m, UG, Bulk; and DDH(7)=6560 m on their DMC target (See "Rubicon Minerals Corp." write-up in the "Red Lake Greenstone Belt" section of "Exploration Activity".)
39	Sabina Gold & Silver Corp. (SBB.T)/Premier Gold Mines Limited (PG) (Newman–Madsen Property)	Heyson Township (Au)	DDH(4)=3183 m Holes targeted the Austen/Madsen stratigraphic horizon.
40	Shoreham Resources Inc. (SMH) (Borland Lake)	Borland Lake Area (Au, Mo, Ag)	AM, AEM, DDH(12)=4072.66 m Completed a versatile time-domain electromagnetic (VTEM) survey (SMH, news release, August 4, 2010). Hole B-10-05 intersected a 1.8 m interval with 0.38 g/t Au and 29.5 g/t Ag (SMH, news release, October 27, 2010).
41	Shoreham Resources Inc. (SMH) (Mattless Lake Property)	Setting Net Creek Area (Au, Mo, U, Ag)	AM, AEM Airborne survey (VTEM) over the property in March and April 2010 in order to identify drill targets (SMH, MD&A for the period ending October 31, 2010, released December 29, 2010).
42	Shoreham Resources Inc. (SMH) (Bear Head Trend Property)	Setting Net Creek Area (Au, Mo, U, Ag)	AM, AEM (VTEM) (SMH, MD&A for the period ending October 31, 2010, released December 29, 2010.)
43	Shoreham Resources Inc. (SMH) (Twinpeaks Property)	Setting Net Lake Area (Au, Mo, Ag)	AM, AEM (VTEM) (SMH, MD&A for the period ending October 31, 2010, released December 29, 2010.)
44	Solitaire Minerals Corp. (SLT) /Ashburton Ventures (ABR) (Chukuni Property)	Byshe and Heyson townships (Au)	DDH(5)=1006 m (ABR, news release, April 28, 2010.) Ashburton decided not to pursue work on the property (ABR, news release, December 21, 2010).
45	Sphere Resources Inc. (SPH.H)/Duncan Park Holdings Corp. (DPH) (Dome Property)	Byshe, Heyson and Dome townships (Au)	IP, Samp Sphere and Duncan Park will jointly explore the property, which has been optioned from Global Minerals Limited (SPH.H, news release, May 11, 2010). Geoserve IP Survey, Logging and Tomography to perform high resolution IP survey to on southern block of Dome Property (SPH.H, news release, June 3, 2010).
46	Tri-Origin Exploration (TOE) (Red Lake Extension-RLX)	South of Otter Lake Area (Au)	GL, Samp (TOE, news release, November 16, 2010.)

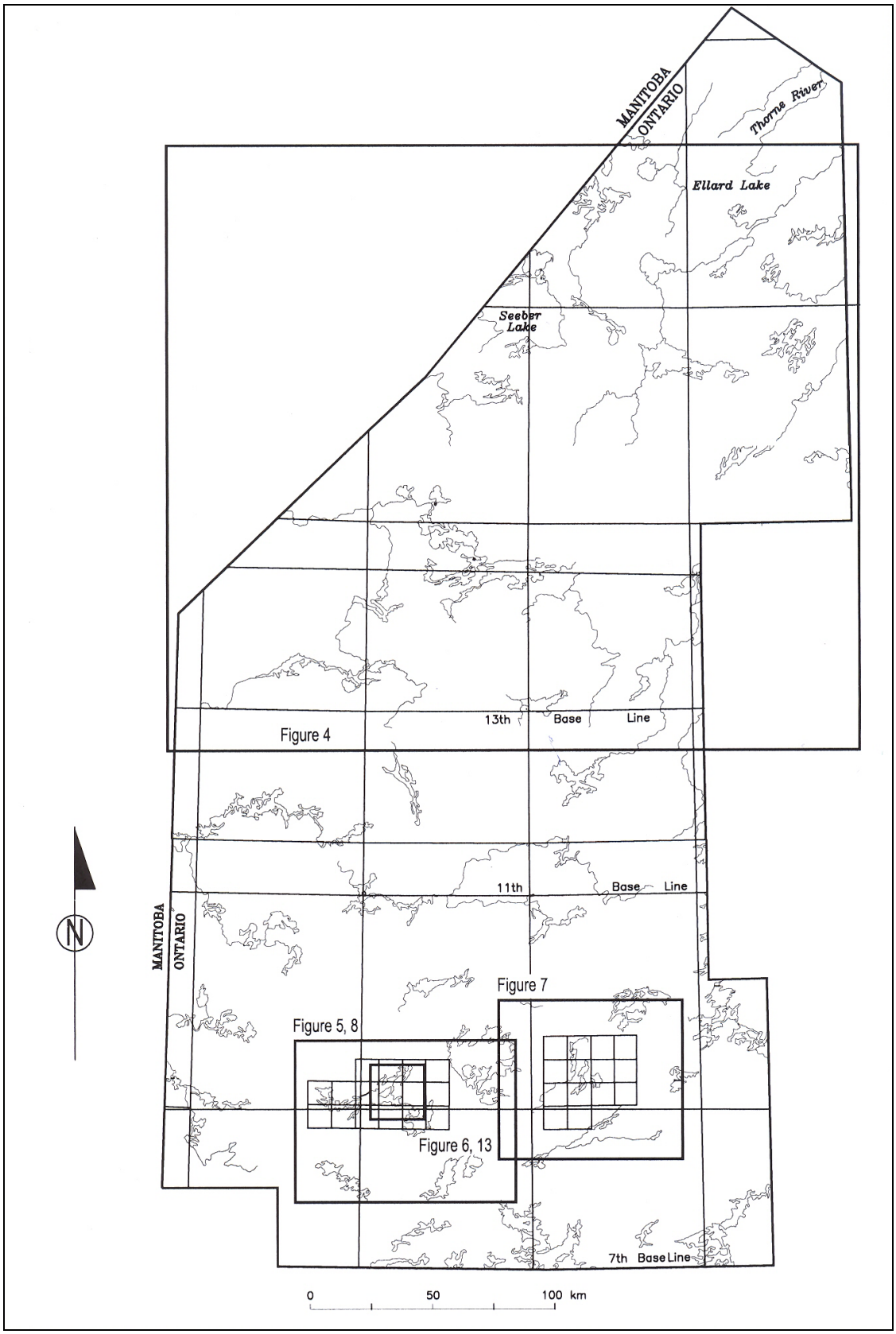


Figure 3. Red Lake District, index map for Figures 4 to 8 and 13.

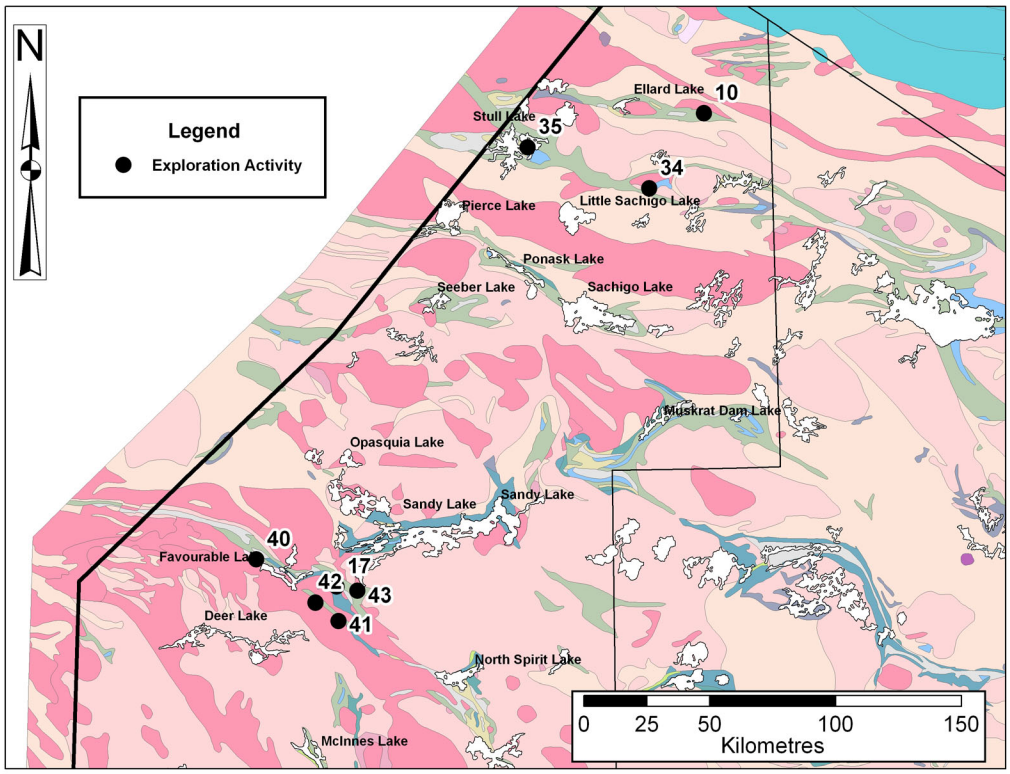


Figure 4. Red Lake District (north part): exploration activity (*see* Table 5).

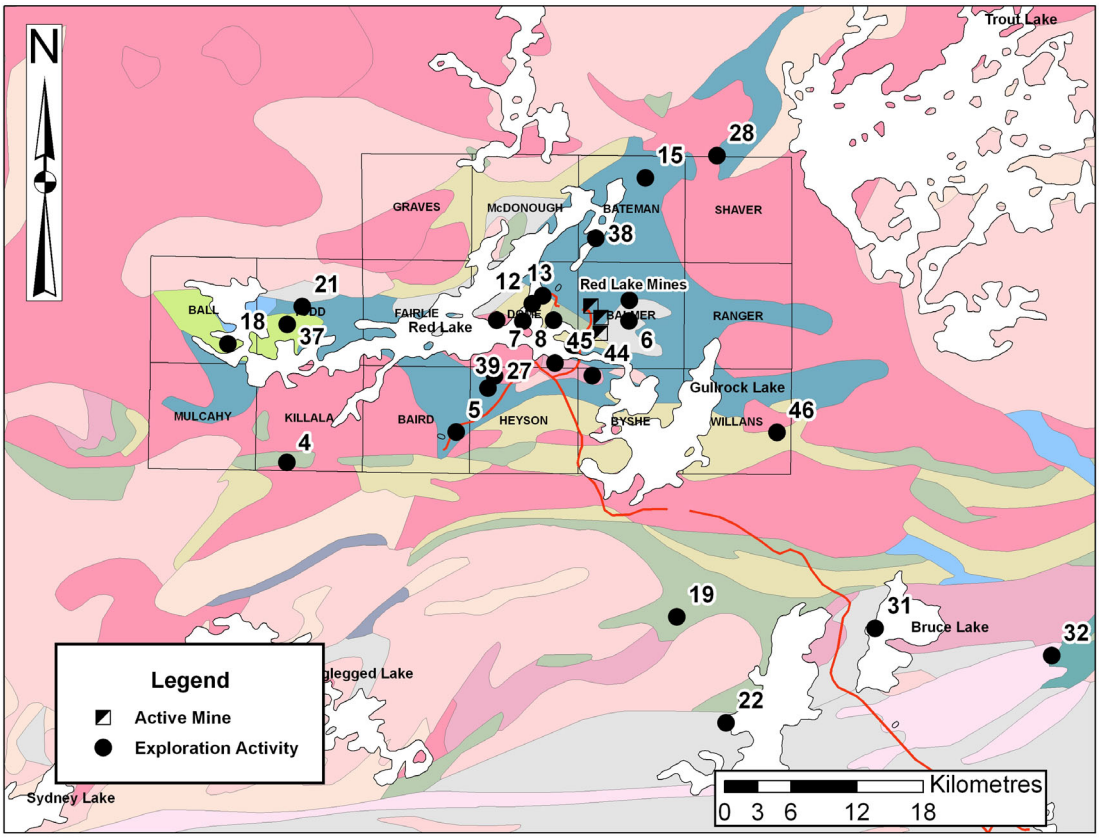


Figure 5. Red Lake greenstone belt: exploration activity and active mines (*see* Table 5). See Figure 6 for more exact locations of exploration activity in the vicinity of Red Lake Mines.

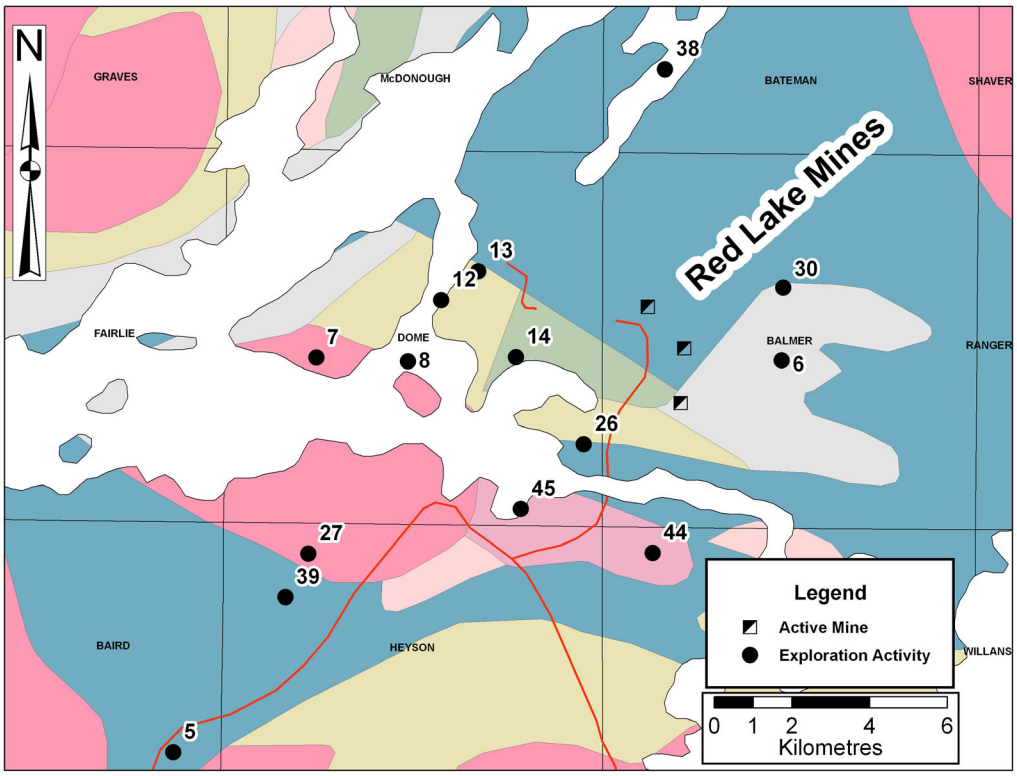


Figure 6. Eastern Red Lake greenstone belt: exploration activity and active mines (*see* Table 5).

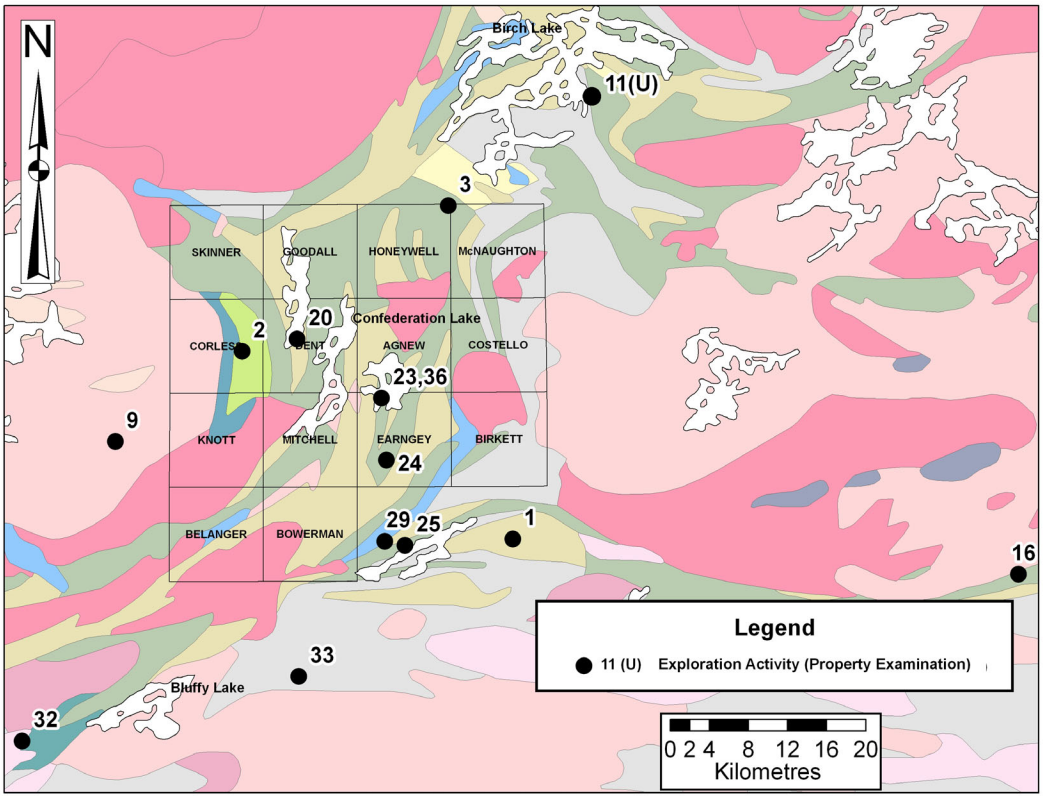


Figure 7. Birch–Uchi greenstone belt: exploration activity and property examination (*see* Tables 5 and 8).

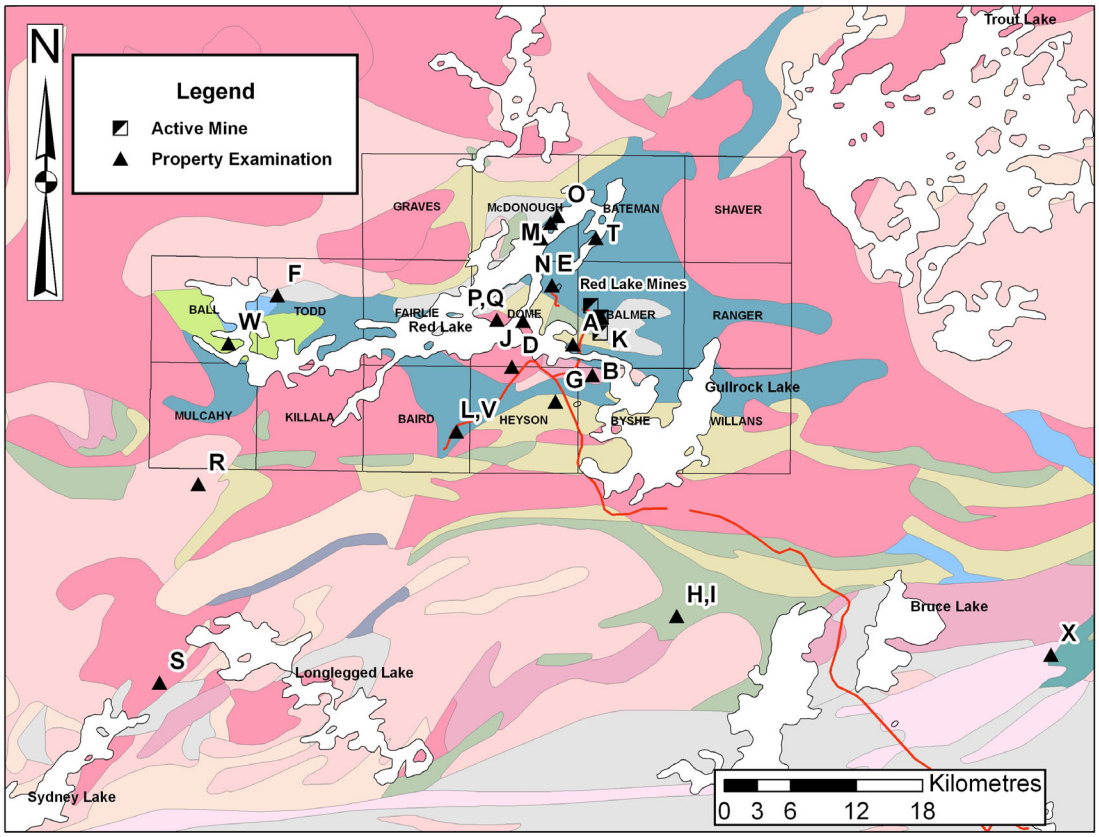


Figure 8. Red Lake greenstone belt: property examinations (*see* Table 8).

Red Lake Greenstone Belt

Exploration in the Red Lake belt has continued at a steady pace since 2001. Table 5 lists the companies and individuals who reported some activity on their property during 2010; several are described in more detail in the following pages.

Work on significant discoveries from 2004 and 2005 continued in 2010 and 3 projects have Advanced Exploration status: Rubicon Minerals Corporation's Phoenix Gold project; Goldcorp Inc.'s Cochenour Project (*see* "Goldcorp Inc. – Red Lake Gold Mines" in "Mining Activity"); and Claude Resources' Madsen Mine project. Rubicon Minerals Corporation has recommissioned the McFinley shaft and is carrying out underground exploration directed at their F-2 Discovery. Claude Resources Inc. continued dewatering its Madsen Mine workings, where production and underground exploration had ceased in 1999. Underground drilling from the 10 level commenced in 2008, and will recommence from the 16 level in early 2011.

Throughout 2010, on a monthly average, 15 surface diamond drills were active in the Red Lake greenstone belt. The continuing high gold price kept current gold exploration projects active, and increased exploration work on previously dormant properties.

GOLDCORP INC.

East Bay Joint Venture

Red Lake Gold Mines Limited ("RLGM"), a subsidiary of Goldcorp Inc., as operator of the East Bay Joint Venture property with Premier Gold Mines Limited, drilled 5 holes in 2010 from the ice of East Bay. A portion of the East Bay Property, including the area currently drilled, is held 35% by Premier and 65% by RLGM, while the "Rivard Block", adjacent to the new discovery, is held 50/50 with RLGM. The target was based on extrapolation from

Rubicon Minerals Corporation's F2 deposit, located approximately 4 km to the southwest. Drilling successfully intersected the East Bay Ultramafic trend and the East Bay shear zone ("EBSZ").

Significant results include (from Premier Gold Mines Limited, news release, October 27, 2010):

Hole	From (m)	To (m)	Interval (m)	Au (g/t)	Zone
EBJV10174	510.3	511.0	0.7	51.04	Quartz Vein
and	565.65	568.4	2.8	7.25	EBSZ
EBJV10176	296.0	297.0	1.0	297.61	EBSZ
EBJV10177	200.5	201.0	0.5	2.44	Quartz Vein
and	457.4	458.1	0.7	2.59	EBSZ

Rahill–Bonanza Joint Venture

The property is held 49% by Premier Gold Mines Limited, and operated by Red Lake Gold Mines Limited, and is located on the 'Mine Trend' between the past-producing Cochenour–Willans mine and the current producer, Red Lake Gold Mines Limited. A number of targets exist on the property, as detailed in the following paragraphs.

Wilmar Mine Extension

The Wilmar Gold Mine was developed via a drift that links it with the nearby Cochenour–Willans mine infrastructure being rehabilitated by Goldcorp Inc. Past production at Wilmar was approximately 60 980 ounces Au, at a grade of 0.30 opt Au (Premier Gold Mines Limited, news release, October 21, 2010). The deposit remained open at depth when the mine shut down in 1971. Current drilling focussed on the depth extent of the deposit.

PG70 Zone

The PG70 Zone consists of multiple gold-bearing horizons associated primarily with favourable ultramafic rock units similar to, and nearby to, Goldcorp's Cochenour (Bruce Channel) Project that is currently being developed by RLGM. Widely spaced drill holes have now intersected mineralization in the PG70 Zone over an area approximately 700 by 350 m.

Significant results from the diamond drilling programs include the following:

Hole	From (m)	To (m)	Interval (m)	Au (g/t)	Zone
PG10071	736.0	738.0	2.00	23.70	PG70
PG10072B	1125.5	1150.5	25.00	4.31	PG70
including	1133.5	1139.5	6.00	9.53	
PG10075	526.0	527.5	1.50	124.30	PG70
PG10076	679.0	680.0	1.00	32.37	PG70
and	816.0	817.0	1.00	6.06	Not correlated
and	928.0	929.0	1.00	10.86	Not correlated
PG10077A	500.0	501.0	1.00	6.70	Not correlated
and	671.5	672.0	0.50	3.92	PG70
PG10081	749.0	763.0	14.00	1.07	Wilmar Granodiorite
and	990.0	992.0	2.00	1.38	PG70
PG10082	757.0	760.5	3.50	68.87	Wilmar 2E
including	759.35	760.5	1.15	207.43	

The high speed tram being constructed by RLGM will pass through, or close to, the Rahill–Bonanza joint venture property at approximately 1645 m depth; this would open up significant areas of deep exploration potential.

HY LAKE GOLD INC.

Hy Lake Gold Inc. controls a large package of ground extending approximately 12 km between Pipestone Bay and Martin Bay of Red Lake, including the Mount Jamie, Golden Tree, Rowan Lake and Red Summit properties. Past production (in 1976) from the Mount Jamie Mine totalled 377 ounces Au; from the Rowan Lake Mine (1986-1988), 1298 ounces Au; and from the Red Summit Mine (1935-1936), 277 ounces Au. The property is underlain by the Balmer, Ball, Slate Bay and Confederation assemblages. Recent drilling by the company has focussed on two targets on the Rowan Lake property (where Hy Lake Gold Inc. can earn a 60% interest from Goldcorp Inc.). In 2010, 9 diamond drill holes, totalling 2656 m, were completed.

The Rowan Lake Mine has a historical inferred resource of 798 000 tons at 4.7 g/t Au contained within 10 zones (Hy Lake Gold Inc., news release, October 21, 2010). In 2010 Hy Lake Gold Inc. drilled 4 holes, totalling 1509 m, to test the structural corridor hosting the deposit. The company interprets the corridor to have a minimum strike length of 800 m, and has been tested to a depth of less than 500 m. Current drilling intersected multiple quartz veins and structural zones; significant results include:

Hole	From (m)	To (m)	Interval (m)	Gold (g/t)
HYR-10-24	10.50	12.00	1.50	7.80
including	10.50	11.30	0.80	14.06
	108.00	110.50	2.50	3.33
including	108.00	108.50	0.50	13.03
HYR-10-25	27.00	29.00	2.00	8.65
including	27.00	28.00	1.00	13.71
	157.00	163.00	6.00	4.82
including	160.00	163.00	3.00	9.15
	298.00	302.00	4.00	7.48
HYR-10-26	45.00	46.00	1.00	11.83
	285.00	286.00	1.00	3.92
HYR-10-27	118.00	120.00	2.00	42.44

Five holes, totalling 1147 m, were drilled on the Rowan NT zone, located approximately 800 m to the south of the Rowan Lake Mine, and adjoining Redstar Gold Corp.'s Newman–Todd property. The zone is characterized by sulphide-magnetite replacement of volcanic and sedimentary rocks within an iron-carbonate alteration halo. The company interprets the Rowan NT zone to extend a minimum of 1800 m to the northeast, and may merge with the Rowan Lake structural corridor (Hy Lake Gold Inc., news release, October 26, 2010). Significant results from the 2010 program include:

Hole	From (m)	To (m)	Interval (m)	Gold (g/t)
HYR-10-28	46.00	48.00	2.00	7.28
HYR-10-29	81.25	83.00	1.75	10.48
	101.00	102.00	1.00	4.93
	132.00	133.00	1.00	12.34
HYR-10-31	54.00	55.00	1.00	3.17
HYR-10-32	90.00	94.00	4.00	5.25
including	90.00	91.00	1.00	12.00

Hy Lake Gold Inc. reported the commencement of a 2200 m diamond drilling campaign, as part of a $550 000 exploration program, budgeted for 2011, on its adjoining Mount Jamie property (Hy Lake Gold Inc., news release, January 27, 2011).

MEGA PRECIOUS METALS INC.

Mega Precious Metals Inc. has two projects in the Red Lake Camp: the North Madsen properties, and the Headway Gold Property. The **North Madsen properties** are situated in northern Heyson and southern Dome townships, immediately west of the Red Lake town site. They comprise the **Laverty, East My-Ritt** and **Skookum** properties. The properties are for the most part underlain by the southern portion of the Dome Stock where it intrudes Balmer Assemblage volcanic rocks (Figure 9).

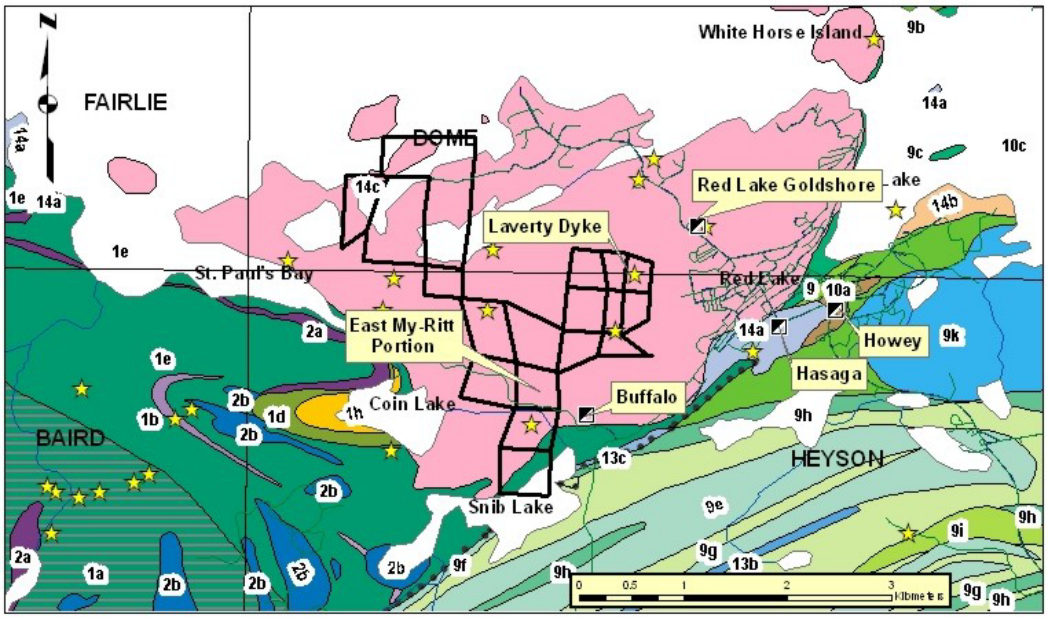


Figure 9. Location of North Madsen properties, Mega Precious Metals Inc., Dome and Heyson townships. Legend: 1 - Balmer Assemblage mafic volcanic rocks; 2 - Balmer Assemblage mafic plutonic rocks; 9 - Confederation Assemblage mafic volcanic rocks; 10 - Huston assemblage; 13 - Pre- to syn-tectonic mafic intrusive rocks; 14 - Dome granodiorite stock; ◪ Present and past-producing gold mine; ★ Gold occurrence or prospect (*adapted from* Sanborn-Barrie, Skulski and Parker 2004).

In 2010, a total of 67 diamond drill holes (for 15 942 m) were drilled on the North Madsen properties: 46 holes (for 10 628 m) on the Laverty, and 21 holes (for 5314 m) on the East My-Ritt. Drilling intersected two prospective gold zones on the East My-Ritt property and confirmed additional potential on the **Laverty Main** and **Hanging Wall** (HW) zones. Fugro Airborne Surveys performed a DIGHEM EM/MAG airborne survey totalling 138 line-km over the North Madsen property area (Mega Precious Metals Inc., news release, November 15, 2010). Diamond drilling on the Laverty portion of the property has identified the "Laverty Corridor", a broad east-trending zone of gold mineralization over 235 m wide that extends for more than 1000 m in length. Diamond drilling on the East My-Ritt shows the Buffalo deposit (Claude Resources Ltd.) mineralization extends onto the East My-Ritt property.

A summary of the results for drilling on the Laverty Property are listed in the table below (Mega Precious Metals Inc., news release, September 9, 2010).

The company published an NI43-101 compliant indicated resource of 395 000 t at 2.56 g/t Au plus an additional inferred resource of 32 000 t at 3.32 g/t Au on the Laverty Dyke zone (above 100 m depth) (Harron and Puritch 2010). This represents both open pit and underground resources.

On the **Headway Property**, deep diamond drilling was started in 2009 and continued throughout 2010. The first hole (MH0901) is intended to reach 3000 m depth. It intersected the main Red Lake unconformity and reached Balmer Assemblage rocks at 2121 m. From 2121 m to 2361 m the hole was in garnet-magnetite-altered mafic metavolcanic rocks. From 2361 m to the depth of 2603 m (November 2010) the hole intersected an interbedded mixture of variably altered mafic to felsic metavolcanic rocks. Mega reports that deeper into the interpreted Balmer Assemblage rocks there is an increasing presence of black line faults, biotite- and silica-altered mafic interbeds, and

sporadic quartz-tourmaline ± iron carbonate veins containing arsenopyrite and pyrite. The second hole, MH1002, encountered the unconformity at 1958 m, which is slightly deeper than the projection of 1700 m (Mega Precious Metals Inc., news release, November 2, 2010).

Hole#	Zone	From (m)	To (m)	Intercept (m)	Au Grade (g/t)
ML1055	HW 2	12.0	19.5	7.5	1.17
ML1056	HW 2	19.0	31.5	12.5	0.88
ML1056	HW 2	126.0	132.0	6.0	1.32
ML1057	HW 2	84.5	96.5	12.0	1.12
ML1058	HW 2	9.0	16.0	7.0	0.77
ML1058	HW 2	55.5	68.3	12.8	0.64
ML1058	HW 2	94.5	99.0	4.5	3.77
ML1058	HW 2	139.5	147.0	7.5	0.76
ML1059	HW 2	16.5	36.0	19.5	0.72
ML1059	HW 2	105.0	111.0	6.0	1.01
ML1060	Main / HW	70.5	97.5	27.0	1.21
including	Main / HW	70.5	79.5	9.0	1.14
including	Main / HW	88.5	97.5	9.0	2.17
ML1060	Main / HW	206.7	207.7	1.0	4.66
ML1061	HW 2	147.0	153.7	6.7	0.76
ML1063	HW 2	204.0	211.5	6.5	1.00
ML1064	Main / HW	99.0	153.8	54.8	1.02
including	Main / HW	152.5	153.8	1.3	17.30 (vg)

Note: True Width is approximately 65% of Intersection Width
Minimum reported interval of ≥ 5 gram-metres using a variable cut-off grade of 0.4 g/t to 0.2 g/t

PREMIER GOLD MINES LTD.

Premier Gold Mines have several properties in the Red Lake camp and have carried out extensive exploration programs in recent years. Through option agreements other companies are now operators of the most active of these projects. The **Rahill–Bonanza** and **East Bay Joint Venture** properties are held in joint venture with Goldcorp Inc. Goldcorp is the operator and the exploration work is discussed under Goldcorp Inc. In April, Premier terminated its option agreement with Newcastle Resources Ltd. on the **Lennie Property.**

The **Newman–Madsen Property** was created in October of 2004, through the acquisition of contiguous packages of land: the **Newman–Heyson**, **My-Ritt**, and **Nova Co**. properties. The **Newman–Madsen** is now held jointly with Sabina Gold and Silver Corp. Sabina is the operator for 2010 exploration.

In October Premier announced the creation of the **Redgold Project**, which includes the **Bobjo Mine Property** (*see* Mainstream Minerals in Table 5), 100% interest in the **Woco Prospect** from Dollard Mines Ltd., a private company, and the **Raingold Property**, composed of six patented mining claims contiguous with the other two properties, all in Earngey Township in the Birch Lake–Confederation Lake greenstone belt.

RUBICON MINERALS CORPORATION

The **Phoenix Gold Project** was the focus of exploration for Rubicon Minerals Corporation during 2010. The property contains the McFinley shaft and surface infrastructure, where an extensive underground exploration project took place in the 1980s. Rubicon Minerals Corporation acquired the rights to the property in 2002, and discovered the F2 Zone in March 2008. Exploration and development work in 2010 was focussed on the F2 Zone. Highlights of this work are detailed below.

- The McFinley shaft was deepened to approximately 350 m depth, with lateral workings on the 305 m level; 1130 m of lateral development, and 135 m of raises were completed in 2010. Preparations for surface plant improvements, including a larger hoist, are underway.

- During 2010, 315 diamond drill holes (including barge-mounted rigs and up to 5 underground rigs), totalling 155 114 m, were drilled on the Phoenix project. This comprised 135 819 m surface and underground on the F2 Zone, and 21 holes (for 19 295 m) on Phoenix regional targets. Underground definition drilling started in November and preparations were made for a bulk sample in December. The F2 Zone is open below 1453 m.

- Rubicon entered into an Exploration Accommodation Agreement with Lac Seul First Nation ("LSFN") covering Rubicon's exploration properties in Red Lake, considered by LSFN to be their traditional territory (RMX, news release, January 21, 2010).

- The Advanced Exploration Closure Plan was accepted by MNDMF early in 2009 and the production Closure Plan will be submitted in early 2011; the other major permits are either in place or are expected in the first quarter of 2011 (RMX, news release, October 12, 2010).

- An NI43-101 compliant resource estimate for the F2 Zone was released (Rubicon Minerals Corporation, news release, November 29, 2010). The total inferred resource stands at 6 200 000 tonnes at a grade of 20.1g/t Au (4 007 000 contained ounces Au).

Significant assays from surface (F2-series) and underground (122- and 305-series) holes are tabulated on the company's website www.rubiconminerals.com. These include the results shown below.

Hole #	Depth to centre of intercept (m)	Gold (g/t)	Metres
F2-100A-W2	1075	20.3	1.0
F2-100A-W2	1280	35.0	1.0
F2-105	436	4.1	9.6
Incl.	439	11.8	2.5
F2-108	1246	152.9	0.5
F2-108-W1	1286	2287.1	0.6
122-73	131	3.4	4.0
122-73	1023	3.4	3.0
122-73	1280	227.5	0.5
122-74	334	51.6	0.5
122-74	1075	22.1	2.0
Incl.	1075	34.4	1.0
305-15	270	14.4	3.5
Incl.	270	24.1	1.4
305-15	261	3.3	43.6
Incl.	260	8.5	9.6
And Incl.	260	21.8	1.7
305-28	273	18.9	2.5
Incl.	273	74.6	0.5
305-28	269	112.7	1.0

Rubicon also carried out a 7-hole diamond drill program for 6560 m on their **DMC property**.

Birch–Uchi and Confederation Greenstone Belts

The Birch–Uchi and Confederation greenstone belts are geologically similar to the Red Lake belt, with the exception that a much larger proportion of the rocks are assigned to the neo-Archean Confederation Assemblage; only a small proportion of meso-Archean rocks (the Woman and Narrow Lake assemblages) have been identified (Sanborn-Barrie, Skulski and Parker 2004). A large amount of unsubdivided mafic metavolcanic rock is exposed in the Birch Lake area and in the eastward extension of the belt towards the district boundary at Root Lake. Both gold and base metals have been historically produced (Tables 3 and 6), but there are no currently producing mines. While large areas of ground are held, exploration activity is not as intense as that in the Red Lake belt. During the year, seven companies and individuals carried out field programs, including diamond drilling. Gold Canyon Resources Inc. had the most extensive program with their diamond drilling on the Springpole Lake Gold Property in the Casummit Lake area. Amador Gold Corp. and Premier Gold Mines Ltd. also carried out diamond drilling programs. In the case of Premier, it was to evaluate the Bobjo Mine property as part of an option agreement with Mainstream Minerals Corporation. Exploration activities are summarized in Table 5. Several projects that had extensive exploration work carried out in 2009 were not active in 2010, for example Skyharbour Resources Ltd.'s South Bay Mine project.

GOLD CANYON RESOURCES INC.

The company controls 100% of the 30 patented and 192 staked claims, covering approximately 20 000 acres, that comprise the Springpole Gold Project. The property is situated in the Birch–Uchi greenstone belt, in the Casummit, Keigat, Satterly and Seagrave lakes areas (Number 11, Table 4 and Figure 7).

A comprehensive review of the project was completed in January 2010, which outlined plans for expanding known mineralization and preparing the project for a pre-feasibility study. As part of this plan, the company commenced an 18-month staged series of 3 drill programs: the first 2 programs, winter and summer 2010, completed 29 holes, totalling approximately 10 300 m. The third drill program, winter 2011, commenced January 18, 2011 (Gold Canyon Resources Inc., news release, January 18, 2011).

Company geologists interpret the historical Main, Camp and Portage zones to be part of the same 1200 m long, 300 m wide northwest-trending near-surface (<200 m depth) zone of gold mineralization. A description of the geology on their Springpole property, from a company news release of December 15, 2010, is included below.

> Springpole is an alkaline intrusion hosting a gold system that represents a potentially new style of Canadian Archean Shield gold deposit. Springpole shares many similarities with deposits such as the Cripple Creek Gold deposit in Colorado. The Portage Zone is hosted by a trachytic porphyry intrusion displaying polyphase autolithic breccias that contain gold mineralization of remarkably uniform grade. Other zones including East Extension, Camp and Main, consist of high grade veins and pods hosted in diatreme breccias composed of intrusive and country rocks. These diatreme breccias surround the northwest and northern margins of the Portage Zone. The known mineralized zones underlie a total known area of about 4 square kilometres representing only about 15 percent of the greater alkaline intrusive complex which yet remains to be explored (Gold Canyon Resources Inc., news release, December 15, 2010).

The more significant results of the 2010 drilling program include (from Gold Canyon Resources Inc., news release, January 18, 2011):

Hole	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)
SP10-001	12.5	64	51.5	0.93	1.03
SP10-002	242	335	93	2.4	11.23
SP10-007	33	250	217	1.57	7.44
SP10-008	257	451	194	1.22	7.63
SP10-009	3	167	164	1.02	2.68
and	214	322	108	1.38	8.06
SP10-019	182	489	307	1.44	5.48
SP10-026	54	407	353	1.17	3.86
SP10-029	301	433	132	2.3	10.8

In addition to appreciable silver values (the gold:silver ratio is estimated to be approximately 1:4.4 in the 18 holes drilled on the Portage Zone), some of the earlier holes drilled this year returned high tellurium values, e.g., Hole SP10-002, from 247.0 m to 311.0 m, assayed 3.30 g/t Au, 14.51 g/t Ag, and 16.59 ppm Te, over 64.0 m.

Table 6. Metal production other than gold in the Red Lake District to December 31, 2010.

Mine	Years of Production	Ore Milled (Short Tons)	Production [1]		
			Metal	Quantity	Grade
Berens River	1939–1948	560 607	Silver	5 796 177 oz	10.34 opt
			Lead	6 105 872 lbs[2]	
			Zinc	1 797 091lbs [2, 3]	
South Bay	1971-1980	1 637 948	Silver	2 876 878 oz	1.76 opt[5]
			Zinc	158 079 tons[4]	
			Copper	22 604 tons[4]	
Griffith	1968-1986		Iron	22 850 000 tons pellets 82 031 500 tons ore[6]	66.7% (pellets) 30% (ore)[6]

Notes (1) Production figures taken from the Mineral Deposit Inventory.
(2) Several different total production figures are found in different sources due to information restrictions during World War II; these figures are from Shklanka (1969).
(3) Zinc was only produced in 1942-45.
(4) Zinc and copper concentrate.
(5) Average grade over mine life.
(6) Estimated from pellet production.

Northern Greenstone Belts

In the Red Lake District, the northern greenstone belts include those volcanic belts formed on rifted continental crust of the North Caribou Terrane (McInnes Lake, North Spirit Lake, Setting Net Lake, Favourable Lake, Sandy Lake, Muskrat Dam Lake, Sachigo Lake, Lingman Lake belts), and belts within the Stull–Oxford terrane that formed as products of juvenile ocean floor–arc volcanism (Stull Lake, Ellard Lake belts) (Sanborn-Barrie et al. 2005).

Several companies hold claims in the northern terranes, either individually or in joint-venture agreements; information on current activity is summarized in Table 5. Shoreham Resources Inc. carried out a 12 hole diamond drill program at their Borland Lake polymetallic property (Ag, Au, Mo). They also carried out an airborne magnetic and electromagnetic survey (VTEM) over Borland Lake and several other claim groups in the Setting Net Lake and Setting Net Creek areas. Golden Share Mining Corporation acquired the past-producing Berens River Mine property and began data compilation and a small sampling program. God's Lake Resources Inc. acquired 182 claim units adjacent to its past-producing Sachigo River Mine property (Sherman Lake Gold Project).

Even though some areas of the northern greenstone belts are under exploration/mining moratoriums from one or more First Nation communities, work continues on several projects. Notable in this is Northern Superior Resources Inc. (formerly Superior Diamonds Inc.) who completed prospecting and sampling programs on their Rapson Bay and Meston Lake properties under an agreement with Sachigo Lake First Nation (Northern Superior Resources Inc., Management Discussion and Analysis, November 17, 2010).

RESIDENT GEOLOGIST STAFF AND ACTIVITIES

In 2010, staff of the Red Lake Resident Geologist's office comprised Andreas Lichtblau *P.Geo.*, Regional Resident Geologist; Carmen Storey *P.Geo.*, District Geologist; and Samantha McDonald, District Support Geologist (DSG). Samantha McDonald resigned in September and was replaced on a temporary basis by Tracy Jeffries on October 14. Work on reorganising files, library and rock samples continued throughout the year.

During the year, staff of the Resident Geologist's office made 24 visits to active and inactive mineral properties, core shacks and research sites and gave 7 field trips (totalling in excess of 75 participants) in the Red Lake District,

including the field trip associated with the CIM Red Lake Branch Exploration Roundup. Field and office activities focussed on delivering high-quality services, data and expertise to the exploration and mining sector, First Nations, municipalities and provincial/federal agencies. C.C. Storey, A.F. Lichtblau and S. McDonald organized the very well-attended Annual CIM Red Lake Branch Exploration Roundup and Field Trip in June in Red Lake, which included talks by industry representatives and a field trip to see recent stripped outcrops on Goldcorp Red Lake Gold Mines claims north of Cochenour.

Photo 3. Red Lake CIM field trip participants examining outcrop on Red Lake Gold Mines Inc.'s Marboy property.

Field trips were organized in the Red Lake District for industry representatives, academics and students in 2010, including 4 general Red Lake field trips for industry representatives, one for Ministry of Natural Resources staff to see exploration activities and one academic trip to selected water-accessible sites on Red Lake.

Two multi-year research projects by Red Lake Resident Geologist Office Staff were begun in 2010. S. McDonald began a study of the rocks bordering the unconformity between Balmer and Confederation assemblage rocks at Madsen. Preliminary stripping, mapping and channel sampling was carried out and is reported in this volume (*see* "South Austin Zone" in "Property Examinations"). Additional work will be reported in future years. C.C. Storey began sampling granitoid rocks to determine their rare earth and rare metal exploration potential.

A.F. Lichtblau attended the Prospectors and Developers Association of Canada (PDAC) Convention in March, the Northwest Ontario Mines and Minerals Symposium meeting in Thunder Bay in April, the Resident Geologist Program and OGS Branch meeting in Sudbury in November, the Manitoba Mining and Minerals Convention in Winnipeg in November, and the Ontario Exploration and Geoscience Symposium in Sudbury in December. He continued to be actively involved in the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Red Lake Branch until October 2010.

C.C. Storey attended the Northwest Ontario Mines and Minerals Symposium meeting in Thunder Bay in April, the Institute on Lake Superior Geology Steeprock Group field trip in Atikokan in May, the Resident Geologist Program (RGP) annual meeting and OGS Branch meeting in Sudbury in November, and the Ontario Exploration and Geoscience Symposium in Sudbury in December. He continued to be actively involved in the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Red Lake Branch and was re-elected as Technical Program Chair for the current year.

S. McDonald attended the Northwest Ontario Mines and Minerals Symposium meeting in Thunder Bay in April.

DRILL CORE STORAGE SITE

The remote diamond drill core storage compound is located 6 km south of Red Lake, on Highway 105. The compound is operated as a self-serve facility by the Red Lake Resident Geologist's office. The Kenora Drill Core Library houses an additional 14 529.9 m of diamond drill core from the Red Lake District.

In 2010, the remote drill core facility had 6 users. The lower number of users was partly due to reconstruction work on Highway 105 that made access to the site more difficult. Industry visits usually extend over several days, involving examining, relogging and sampling core that would be otherwise unavailable.

Diamond-drill core from the Solitaire Minerals Corp./Ashburton Ventures Inc. Chukuni Property was donated to the remote core facility this year (Table 7). There is additional diamond-drill core from industry projects stored at the site but not yet incorporated in the collection and not included in the table. The core lengths listed in Table 7 are the total lengths of core submitted rather than the total length of the holes.

Table 7. Drill core stored at the Red Lake Resident Geologist's District Remote Drill Core Compound.

Company	Property	Township/Area	Length (m)
Ansil Resources Ltd.	Baird Tp	Baird Township	177.9
Ansil Resources Ltd.	Willans Tp	Willans Township	351
Ansil Resources Ltd.	Ranger Lake	Ranger Township	245
Asarco Exploration Co. of Canada Ltd.	Skinner, Goodall	Skinner and Goodall townships	444.0
Barrick Gold Corporation	Hasaga Mine	Heyson Township	2889.8
Barrick Gold Corporation	Red Lake Gold Shore Mine	Dome Township	106.7
Barrick Gold Corporation	Red Lake Gold Shore Mine	Dome Township	257.6
Belmont Resources Inc./ International Montoro Resources Inc.	Walsh Lake	Bateman Township	474.0
Belmont Resources Inc./ International Montoro Resources Inc.	Shaver Lake	Bateman and Shaver townships	882.2
Canadian Industrial Minerals Corp.	Bouzan Lake	Heyson Township	2029.2
CANMET Howey and Hasaga Mine Hazards Drilling	Howey-Hasaga	Heyson Township	1027.2
Central Geophysics Ltd.	Conifer Lake Complex	Sumach Lake Area	170.8
Cross Lake Minerals Ltd.	Gerry Lake	Gerry Lake Area	981.0
Cypress Development Corp./ Skyharbour Resources Ltd.	McKenzie Island	Dome Township	3059.9
Cypress Development Corp./ Skyharbour Resources Ltd.	McKenzie Island	Dome Township	2081.8
East West Resource Corporation	Bouzan Lake	Heyson Township	1489.5
Freewest Resources Ltd.	McQuaig Property	Dome Township	993.1
Hemlo Gold Mines Ltd.	Miles Red Lake	Todd Township	369.3
ITL Capital Corp./Rupert Resources Ltd.	Durham-McEwen	Balmer Township	1682.5
Lac Properties Ltd.	Hasaga Mine: Time-Domain Reflectometry (TDR) cables installed in the Crown Pillar	Heyson Township	33.7
Loydex Resources Inc.	Bug River	Heyson Township	190
Mutual Resources Ltd.	Dixie Lake	Dixie Lake Area	499.3
Noramco Explorations Inc.	Various	Ball Township	31 268.6
"		Balmer Township	
"		Byshe Township	
"		Dome Township	
"		Fairlie Township	
"		Goodall Township	
"		Honeywell Township	

Company	Property	Township/Area	Length (m)
"		McDonough Township	
"		Ranger Township	
"		Shabumeni Lake Area	
"		Skinner Township	
"		Todd Township	
Noranda Exploration Company Ltd.	Selco Dixie Joint Venture	South of Otter Lake and Karas Lake areas	1638.2
Pure Gold Resources Inc.	McKenzie Island	Dome Township	1762.4
Rio Algom Exploration Co. Ltd.	Fly Lake	Mitchell Township	731.0
**Skyharbour Resources Ltd.	Heyson	Heyson and Byshe townships	2018.2
**Skyharbour Resources Ltd.	Heyson	Heyson and Byshe townships	731.0
**Skyharbour Resources Ltd./ Consolidated Abaddon Resources Inc.	Sidace Lake Property	Sobeski Lake Area	2215.7
**Skyharbour Resources Ltd./ Consolidated Abaddon Resources Inc.	Black Bear Property	Black Bear Lake Area	694.9
*Solitaire Minerals Corp./Ashburton Ventures Inc.	Chukuni Property	Byshe Township	391.3
Teck Exploration Ltd.	Howey Mine	Heyson Township	7255.5
Tri Origin Exploration Ltd.	RLX Property	Willans Township	686.5
Tri Origin Exploration Ltd.	RLX Property	Willans Township	120.0
Tri Origin Exploration Ltd.	RLX Property	South of Otter Lake Area	32.3
United Reef Petroleums Limited	Aiken-Russett	Baird Township	8154.0
Western Pacific Energy Corp.	Swain Lake	Goodall Township	1936.2
TOTAL			**82006.3**

*2010 submission; **length is total length of hole including overburden

PROPERTY EXAMINATIONS

Table 8 lists the property visits conducted by staff in 2010 in the Red Lake District. Major authorship of the following property examinations is indicated in parentheses following the titles. A location map, keyed to the property numbers, is shown in Figures 7 and 8. The figure locations are superimposed on geology from the *Seamless Bedrock Geology of Ontario* (Ontario Geological Survey 2000).

Table 8. Property visits conducted by the Red Lake Regional Resident Geologist and staff in 2010 (keyed to Figures 7 and 8). Letters in brackets refer to visits to core logging facilities in Red Lake.

Index	Property or Occurrence	Location	*see* Figure
(A)	Headway Gold Property core shack (Mega Precious Metals Ltd.)	Balmer Township	8
(B)	Chukuni Project-Red Lake core shack (Ashburton Ventures Inc.)	Byshe Township	8
(C)	Borland Lake-Red Lake core shack (Shoreham Resources Ltd.)	Borland Lake Area	
(D)	North Madsen-Red Lake core shack (Mega Precious Metals)	Heyson and Baird townships	8
E	Goldcorp Tucker's Knob (Goldcorp Inc.)	Bateman Township	8
F	Newman–Todd project core shack at the Mount Jamie Mine (Hy Lake Gold Inc.)	Todd Township	8
G	Heyson sulphide float	Heyson Township	8
H	Larry Herbert Dixie Property	Dixie Lake Area	8
I	Larry Herbert Dixie South Property	Dixie Lake Area	8
(J)	Broulan Reef core shack (Cypress Development Corp.)	Dome Township	8
K	Goldcorp Red Lake Mine	Balmer Township	8
L	Madsen Mine core shack (Claude Res. Inc.)	Baird Township	8
M	Tomato Lake Occurrence (Cliff Harvey Showing)	McDonough Township	8
N	Little Goldseekers Bay Occurrence	McDonough Township	8

Index	Property or Occurrence	Location	*see* Figure
O	Hoyles Bay Occurrence	McDonough Township	8
P	Bishop showing, McKenzie Island Project (Crown Minerals Corp.)	Dome Township	8
Q	North Strip McKenzie Island Project (Crown Minerals Corp.)	Dome Township	8
R	Medicine Stone Lake Area granitoid sampling (North Part)	Killala Township, Medicine Stone Lake Area, Telescope Lake Area	8
S	Medicine Stone Lake Area granitoid sampling (South Part)	Leano Lake Area	8
T	Phoenix Gold Project/McFinley Mine (Rubicon Minerals Corp.)	Bateman Township	8
U	Springpole Lake Project (Gold Canyon Res. Inc.)	Casummit Lake Area	7
V	South Austin Zone (Claude Resources Inc.)	Baird Township	8
(W)	West Red Lake Project core shack (Halo Resources)	Ball Township	8
X	Karas Lake Property (Northern Iron Corp.)	Karas Lake Area	8
	Tabor Lake core shack (Crown Minerals Corp.)		

Rare Earth Elements in Granitoid Rocks (C.C. Storey)

The increasing demand for rare earth elements has raised interest in the exploration for these elements. Castor and Hedrick (2006) give an overview of world rare earth deposits and production and briefly describe the various deposit types. The rare earth elements are the lanthanide series plus yttrium from the periodic table. Rare earths are divided into two types: the light rare earth elements (LREE) lanthanum to europium; and the heavy rare earth elements (HREE) gadolinium to lutetium plus yttrium. Table 9 lists the elements, their atomic number and crustal abundance. Rare earths are found in most rocks and many are more common in the earth's crust than the most sought after of the metallic elements (Castor and Hedrick 2006). While rare earth elements are very common (i.e., not rare at all) they can only be extracted from deposits with an economic concentration of rare earth minerals and not from the common rock forming minerals where they appear as part of the trace element chemical analysis. Rare earth minerals are typically complex oxides, phosphates, carbonates or fluorides and can contain several rare earth elements. The similar radii and oxidation states of the elements allow them to substitute in the crystal lattices of the rare earth minerals. These minerals are only concentrated to recoverable quantities in specific geological environments.

Table 9. Rare earth elements and crustal abundances (from Castor and Hedrick 2006).

Element	Symbol	Atomic Number	Crustal Abundance (ppm)	
Yttrium	Y	39	22	HREE
Lanthanum	La	57	30	LREE
Cerium	Ce	58	64	LREE
Praseodymium	Pr	59	7.1	LREE
Neodymium	Nd	60	26	LREE
Promethium*	Pm	61	na	LREE
Samarium	Sm	62	4.5	LREE
Europium	Eu	63	0.88	LREE
Gadolinium	Gd	64	3.8	HREE
Terbium	Tb	65	0.64	HREE
Dysprosium	Dy	66	3.5	HREE
Holmium	Ho	67	0.80	HREE
Erbium	Er	68	2.3	HREE
Thulium	Tm	69	0.33	HREE
Ytterbium	Yb	70	2.2	HREE
Lutetium	Lu	71	0.32	HREE
Total REE			**168.37**	

*Promethium is not included in the trace element analyses

Rare earth minerals are found in and have been produced from a wide variety of rock types. Significant world production has come from carbonatite intrusive bodies, laterites, placer deposits, peralkaline igneous rocks and vein deposits (often quartz-carbonate-fluorite with accessory rare earth minerals). Previous exploration activities in northwestern Ontario were directed at carbonatite intrusive bodies of mid to late Precambrian age. In the Red Lake District, Carb Lake (Sage 1987) is the only reported carbonatite intrusive. Another reported alkalic intrusive complex with rare-earth-enriched zones occurs at Springpole Lake (Barron 1996). This area is currently being explored for gold by Gold Canyon Resources (*see* Table 5). The deposit models other than carbonatite that could be expected in the Red Lake District include peralkaline granitoid bodies and fluorite-bearing vein deposits. The peralkaline granitoid rock model was selected for further study because there are large areas of granitoid rock available in the district and some areas have been subdivided into multiple phase plutons. The goal of this study was not to find rare earth deposits but to investigate the rare earth content and chemical nature of granitoid rocks in an area with reasonable access and defined granitoid plutons.

Rare metal (i.e., lithium, beryllium and tantalum) pegmatite deposits have been studied much more extensively than the rare earth type pegmatites. Significant rare metal pegmatites are known in the Red Lake District at Root Lake and Pakeagama Lake. Breaks, Selway and Tindle (2003) summarizes much of the work on pegmatites, particularly the rare metal type. The major element chemistry parent of the granitoid body and resulting pegmatites is significant in determining what, if any, rare metal or rare earth exploration potential exists. Rare metal pegmatites form from peraluminous granites while rare earth pegmatites are associated with peralkaline granites. The affinity of a rock sample is determined by the A/CNK ratio. This is a molecular ratio of $Al_2O_3/(CaO + Na_2O + K_2O)$ calculated from the bulk whole rock analysis. A/CNK = (wt % Al_2O_3 in sample/101.96128)/[(wt % CaO in sample/56.08) + (wt % Na_2O in sample/61.979) + (wt % K_2O in sample/94.197)] (Breaks, Selway and Tindle 2003). This ratio can be calculated from published major element analyses and has been provided by Tindle, Selway and Breaks (2002) for a large number of analyses of rare-metal-related granitoid rocks in the Superior Province of northwest and northeast Ontario. Major element analyses of granitoid rocks are not available for most of the Red Lake District, with the exception of Tindle, Selway and Breaks (2002) and Stone (1998). Rare metal pegmatites (i.e., lithium, beryllium, tantalum) are associated with peraluminous granitoid rocks (A/CNK > 1) while rare earth pegmatites are associated with peralkaline granitoid rocks (A/CNK< 1). Most granitoid rocks have A/CNK between 0.9 and 1.1 (see data from Stone (1998) and Tindle, Selway and Breaks (2002)). For this study, this range is referred to as 'normal'.

Rare earth deposits associated with or hosted by peralkaline granitoid rocks are described by Richardson and Birkett (1996). They describe Canadian deposits occurring in a variety of peralkaline igneous rocks and several world deposits. The known magmatic deposits occur in ovoid to elongate bodies from less than one square kilometre to several tens of square kilometres that are the final intrusive stages of multi-phase batholith complexes, indicating that fractionation of the parent granitoid magma is an important factor in deposit creation. The age of the Canadian and world deposits—when reported—is Proterozoic or younger. The only production of rare earth minerals from this deposit type was from the Lovozero Complex in Russia (Castor and Hedrick 2006).

Other than the granitoid rocks sampled by Stone and Tindle, Selway and Breaks, relatively little is known about the chemistry of the granitoid rocks in the Red Lake District, and even less about their rare earth content. The exploration model for rare earths in other than carbonatite complexes is small, late-stage peralkaline granitoid bodies and related pegmatitic or fine-grained dikes (Richardson and Birkett 1996). The Medicine Stone Lake area was selected for initial study because the granitoid rocks there were subdivided into different suites based on field relationships (Atkinson 1999), and a recent lake sediment survey over this area is available (Dyer and Hamilton 2007). The current study includes several samples from sites associated with elevated rare earths in lake sediment in the Medicine Stone Lake map area. Table 10 lists the locations of the samples. Table 11 contains major element analyses of granitoid rocks sampled in the Medicine Stone Lake area plus some samples from other granitoid bodies. Table 12 shows their rare earth analyses and Table 13 the rare metal, and other trace element analyses.

The A/CNK ratios for most of the samples taken in this study fall in the 'normal granitoid' 0.9 to 1.1 range. Samples 2010CS010 and 2010CS016 have A/CNK ratios of 0.838 and 0.843, indicating they are somewhat more peralkaline than the other samples. These two also have higher total rare earth elements. Examining this data set and results in Stone (1998) indicates there is a positive correlation between more strongly peralkaline granitoid rocks and higher total rare earth elements. But there are instances of elevated total rare earths and normal or even peraluminous rocks in the study area, e.g., sample 2010CS048. Examining Table 12, several values exceed the crustal abundance of Table 9. These values are shown in bold type. Due to the low number of samples and the low number of analyses that actually exceeded published crustal abundances, anomaly levels were not established. The

majority of values that exceed crustal abundance are from samples 2010CS010 to 2010CS016. These are from an ovoid biotite granite to granodiorite body in southern Killala Township. This also coincides with reported elevated REE (dysprosium, gadolinium, neodymium and ytterbium) in lake sediment (Dyer and Hamilton 2007). The other two samples with above crustal abundance REE also occur near elevated REE in lake sediment. Richardson and Birkett (1996) indicate that a high Rb/Sr ratio is indicative of peralkaline rocks associated with rare earth deposits. The highest Rb/Sr ratio is from sample 2010CS025, which does contain REE above crustal abundance. Comparing the results of this survey to data published by Stone (1998) indicates similar REE values, except several of Stone's rock units show much higher Ce and La values. The implications of this are unknown.

The results of this study show elevated rare earth values from granitoid rocks that coincide with elevated rare earths in lake sediment. The minerals containing rare earths were not determined, and there is no indication that any of these rare earths could actually be recovered. Further study is necessary to determine rare earth element mineralogy, sites of rare earth concentration, and rare earth deposit models in Archean granitoid and related rocks.

Table 10. Rock sample locations and descriptions for samples taken during this study. All locations are NAD 83. Unless otherwise noted, all samples were taken in the area of map P.3397 (Atkinson 1999) with rock codes from that legend.

Sample	Easting	Northing	Rock Code	Rock Type
2010CS010	423178	5647139	15a	Massive dark grey biotite granitoid cut by dikes of pink biotite aplite; sample from dark grey rock
2010CS011	423178	5647139	15a	Pink biotite aplite dike
2010CS013	423659	5646705	15a	Massive light pink granitoid
2010CS014	423367	5646377	15a	Dark grey biotite granitoid cut by light pink granitoid dikes; sample from dark grey rock
2010CS015	423367	5646377	15a	Light pink dike from site of sample 014
2010CS016	423160	5646169	15a	Sample from dark grey xenolith from site of sample 017
2010CS017	423160	5646169	15a	Pink massive granitoid with dark grey xenoliths
2010CS018	421270	5646169	12a	Killala–Baird Batholith massive pink granitoid
2010CS019	411827	5641600	12a	Pink pegmatite dike parallel to the gneissosity of migmatitic biotite gneiss
2010CS019A	412111	5641600	11a	Pink biotite granite with mafic xenoliths
2010CS020	412248	5641573	11a	Dark grey to pink biotite granitoid with xenoliths
2010CS021	406747	5637945	12a	Onnie–Detour Stock massive pink granitoid with minor pegmatite dikes
2010CS022	405948	5637501	12a	Atikaki Batholith massive pink granitoid with minor pegmatite dikes
2010CS023	401808	5630196	12a	Atikaki Batholith massive grey biotite granite with minor pink pegmatite veins
2010CS024	403169	5627460	12a	Atikaki Batholith grey to pink biotite granite cut by pink pegmatite (sample from grey-pink material)
2010CS025	403147	5627224	12a	Atikaki Batholith dark grey amphibolite cut by pink pegmatite dikes (migmatite); sample from pegmatite
2010CS026	403134	5626858	12a	Atikaki Batholith; sample from pink pegmatite mobilizate cutting amphibolite
2010CS004A	443385	5664036	7c	Biotite granodiorite; rock code from Pirie and Sawitzky (1977)
2010CS021 SP				Duplicate sample inserted by laboratory
2010CS045	403567	5626524	11a	Pink fine-grained granitic dike
2010CS046	405035	5625718	12ap	Pink fine-grained pegmatite
2010CS047	407980	5623740	12ap	Massive pink pegmatite sill-like body
2010CS048	408577	5623810	15ap	Massive pink pegmatite
2010CS049	409728	5623352	15a	Pink granitic mobilizate from apparently migmatitic rock
2010CS051	406334	5622622	11a	Pink pegmatitic mobilizate from migmatite gneiss
2007CS009				Muscovite sample, McKenzie Bay Road (Lichtblau et al. 2008)
2007CS010				Muscovite-bearing pegmatite dikes, McKenzie Bay Road (Lichtblau et al. 2008)

Table 11. Major element analyses of selected granitoid rocks sampled during this study. Sample descriptions and locations are in Table 10.

Units	Al_2O_3 wt%	CaO wt%	Fe_2O_3 wt%	K_2O wt%	LOI wt%	MgO wt%	MnO wt%	Na_2O wt%	P_2O_5 wt%	SiO_2 wt%	TiO_2 wt%	Total wt%	A/CNK
Detection Limit	**0.01**	**0.01**	**0.01**	**0.01**	**0.05**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**		
2010CS010	15.94	5.62	6.27	2.63	1.58	4.33	0.12	3.62	0.18	58.59	0.7	99.59	0.838067
2010CS011	14.01	1.19	1.07	4.96	0.93	0.28	0.01	3.81	0.03	73.66	0.11	100.07	1.015201
2010CS013	15.16	2.01	1.46	2.81	0.46	0.61	0.03	5.02	0.05	72.31	0.16	100.09	1.013745
2010CS014	16.44	4.92	5.55	2.6	1.13	3.77	0.08	3.7	0.36	60.35	0.65	99.53	0.921194
2010CS015	16.79	3.15	1.94	2.33	0.78	0.96	0.02	5.25	0.14	67.23	0.35	98.93	0.994319
2010CS016	17.81	5.87	8.25	1.92	1.19	4.11	0.14	5.08	0.34	53.64	0.82	99.17	0.843763
2010CS017	15.5	2.46	1.77	1.75	0.64	0.72	0.02	5.32	0.05	71.43	0.19	99.86	1.025216
2010CS018	15.31	2.23	1.54	2.55	0.68	0.61	0.03	5.13	0.06	71.2	0.19	99.55	1.003673
2010CS019	14.82	2.24	2.39	3.13	1.11	1.32	0.03	4.11	0.1	69.91	0.29	99.46	1.04205
2010CS019A	15.09	2.88	2.79	2.53	0.84	1.44	0.04	4.61	0.11	68.52	0.29	99.14	0.969878
2010CS020	15.27	3	3.94	2.8	1.12	2.28	0.06	4.52	0.14	66.12	0.48	99.73	0.959108
2010CS021	15.21	2.2	1.62	2.97	0.37	0.54	0.03	4.73	0.05	72.56	0.18	100.47	1.01427
2010CS022	16.13	2.98	2.22	2.16	0.74	1.03	0.04	5.37	0.11	68.79	0.29	99.85	0.972258
2010CS023	16.76	3.52	3.02	1.82	0.6	1.21	0.05	5.27	0.11	67.22	0.32	99.89	0.983596
2010CS024	14.95	2.73	2.28	1.32	0.8	0.68	0.04	5.04	0.09	72.15	0.25	100.35	1.018143
2010CS025	13.78	0.88	0.58	3.71	0.38	0.11	0.01	4.81	0.01	76.16	0.05	100.49	1.018578
2010CS026	14.65	0.59	0.32	7.52	0.39	0.09	0.01	2.73	<0.01	73.82	0.03	100.15	1.069058
2010CS004A	15.88	3.1	2.85	2.42	0.86	0.67	0.05	4.53	0.15	68.72	0.24	99.47	1.010951
2010CS021 SP	14.93	2.2	1.63	2.93	0.33	0.55	0.03	4.72	0.05	72.28	0.18	99.82	0.999581
2010CS045	13.14	0.63	0.91	5.86	0.44	0.18	0.02	3.26	0.03	75.14	0.08	99.68	1.022453
2010CS046	13.02	0.4	0.52	5.37	0.46	0.08	0.01	3.83	0.01	75.85	0.06	99.61	1.013972
2010CS047	13.21	1.15	0.9	4.25	0.48	0.17	0.02	4.17	0.02	75.4	0.1	99.87	0.97482
2010CS048	13.21	0.61	1.25	5.31	0.59	0.23	0.03	3.64	0.03	76.03	0.14	101.07	1.028425
2010CS049	13.17	0.96	1.12	5.89	0.32	0.42	0.02	3.23	0.01	74.8	0.09	100.04	0.980308
2010CS051	13.96	0.96	1.13	7.64	0.38	0.36	0.02	2.49	0.03	73.29	0.09	100.34	0.989269
2007CS009	34.48	0.02	2.34	10.47	5.11	0.49	0.03	0.63	0.04	45.71	0.12	99.44	2.779351
2007CS010	15.07	0.38	0.53	4.16	0.97	0.08	0.02	4.77	0.28	73.42	0.03	99.7	1.155597

Analyses by Geoscience Laboratories, Ministry of Northern Development, Mines and Forestry, Sudbury, Ontario.

Table 12. Rare earth element analyses for samples described in Table 10.

Units	Ce ppm	Dy ppm	Er ppm	Eu ppm	Gd ppm	Ho ppm	La ppm	Lu ppm	Nd ppm	Pr ppm	Sm ppm	Tb ppm	Tm ppm	Y ppm	Yb ppm	Total REE
Detect Limit	**0.12**	**0.009**	**0.007**	**0.0031**	**0.009**	**0.0025**	**0.04**	**0.002**	**0.06**	**0.014**	**0.012**	**0.0023**	**0.0019**	**0.05**	**0.009**	
2010CS010	50	3.315	1.587	**1.443**	**4.534**	0.616	23.53	0.181	**27.02**	6.363	**5.65**	0.603	0.215	16.09	1.295	142.442
2010CS011	35.36	2.124	1.251	0.551	2.321	0.416	17.63	0.186	14.51	3.954	2.86	0.357	0.19	12.04	1.256	95.006
2010CS013	18.83	0.801	0.436	0.349	1.04	0.153	9.19	0.061	7.28	2.015	1.307	0.137	0.063	4.53	0.407	46.599
2010CS014	**76.05**	3.359	1.364	**2.005**	**6.146**	0.552	**33.73**	0.139	**43.04**	9.83	**8.774**	**0.702**	0.178	15.33	1.035	**202.234**
2010CS015	53.5	1.069	0.479	0.873	1.894	0.183	23.73	0.061	19.44	5.355	3.146	0.221	0.067	5.02	0.437	115.475
2010CS016	**67.05**	3.413	1.8	**1.646**	**4.72**	0.649	**31.93**	0.244	**33.9**	**8.369**	**6.209**	0.614	0.252	17.9	1.663	**180.359**
2010CS017	17.26	0.543	0.298	0.308	0.639	0.107	6.41	0.047	4.97	1.355	0.835	0.093	0.046	3.1	0.31	36.321
2010CS018	24.77	0.931	0.507	0.46	1.244	0.17	12.13	0.088	10.24	2.763	1.833	0.166	0.083	5.37	0.597	61.352
2010CS019	42.7	1.105	0.541	0.816	1.721	0.193	21.51	0.069	16.45	4.62	2.604	0.212	0.073	5.58	0.452	98.646
2010CS019A	46.85	1.587	0.829	0.876	2.308	0.293	24.75	0.113	18.85	5.196	3.136	0.294	0.117	8.54	0.757	114.496
2010CS020	45.33	1.814	0.924	0.86	2.517	0.336	25.12	0.14	21.01	5.707	3.465	0.328	0.14	9.31	0.915	117.916
2010CS021	30.29	0.714	0.371	0.528	1.017	0.134	16.5	0.056	10.69	3.082	1.558	0.128	0.056	3.86	0.364	69.348
2010CS022	32.12	1.219	0.627	0.701	1.784	0.222	14.08	0.084	16.1	4.106	2.73	0.226	0.088	6.3	0.584	80.971
2010CS023	33.29	1.612	0.853	0.686	2.137	0.298	16.12	0.122	14.12	3.704	2.705	0.295	0.126	8.85	0.817	85.735
2010CS024	33.92	0.889	0.46	0.553	1.364	0.167	19.21	0.066	12.16	3.461	1.898	0.165	0.061	5.07	0.401	79.845
2010CS025	8.87	2.16	1.729	0.229	1.6	0.516	4.5	**0.336**	4.16	1.012	1.223	0.296	0.291	17	2.047	45.969
2010CS026	5.47	0.231	0.144	0.35	0.303	0.046	2.64	0.032	2.33	0.616	0.453	0.04	0.024	1.45	0.177	14.306
2010CS004A	41.02	1.007	0.511	0.785	1.557	0.186	22.02	0.073	15.68	4.373	2.375	0.195	0.072	5.31	0.488	95.652
2010CS021 SP	33.8	0.765	0.387	0.557	1.067	0.139	18.08	0.062	11.54	3.418	1.642	0.137	0.058	4.07	0.402	76.124
2010CS045	33.76	0.938	0.511	0.413	1.224	0.181	13.6	0.078	9.88	3.006	1.685	0.169	0.078	4.94	0.506	70.969
2010CS046	21.99	2.213	1.399	0.27	2.095	0.454	10.09	0.234	9.24	2.55	2.31	0.352	0.224	12.6	1.55	67.571
2010CS047	36.34	1.621	0.889	0.41	2.531	0.301	18.77	0.147	15.21	4.155	3.203	0.317	0.132	8.82	0.911	93.757
2010CS048	84.9	1.312	0.727	0.618	2.271	0.256	**45.94**	0.119	27.7	**8.768**	3.782	0.275	0.11	7.09	0.74	**184.608**
2010CS049	16.3	0.85	0.489	0.335	0.99	0.164	6.62	0.079	5.28	1.521	1.176	0.146	0.076	4.5	0.518	39.044
2010CS051	26.4	1.346	0.838	0.675	1.622	0.273	12.98	0.138	10.43	2.947	1.967	0.235	0.13	7.94	0.875	68.796
2007CS009	<0.2	<0.02	<0.02	<0.005	<0.02	0.004	<0.09	0.005	<0.08	<0.02	0.03	<0.003	0.002	0.09	0.027	0.158
2007CS010	2.5	0.1	0.07	0.047	0.18	0.024	1.2	0.019	0.85	0.26	0.24	0.027	0.015	0.89	0.116	6.538

REE Analyses by Geoscience Laboratories, Ministry of Northern Development, Mines and Forestry, Sudbury, Ontario.

Table 13. Other trace element analyses for samples described in Table 10.

Units	Be ppm	Cs ppm	Ga ppm	Hf ppm	In ppm	Li ppm	Mo ppm	Nb ppm	Rb ppm	Sc ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm	Tl ppm	U ppm	Zr ppm	Rb/Sr
Detect Limit	**0.04**	**0.013**	**0.04**	**0.14**	**0.0018**	**0.4**	**0.08**	**0.028**	**0.23**	**1.1**	**0.16**	**0.6**	**0.023**	**0.018**	**0.005**	**0.011**	**6**	
2010CS010	1.44	1.586	20.65	1.84	0.053	42	0.57	4.873	63.01	14	1.26	676.5	0.198	2.948	0.285	0.945	54	0.093141
2010CS011	1.53	1.198	18.88	3.31	0.003	6.4	0.83	12.88	97.78	3	0.27	232.9	1.475	10.684	0.353	4.625	86	0.419837
2010CS013	1.23	1.062	18.41	2.71	0.013	27.6	0.41	3.986	57.22	3.1	0.6	470.6	0.32	2.206	0.258	0.718	89	0.121589
2010CS014	1.54	2.554	21.67	3.53	0.053	46.6	0.49	7.087	72.6	12.2	1.6	722.6	0.439	5.26	0.376	1.496	133	0.100471
2010CS015	1.32	1.631	19.88	5.16	0.007	18.2	0.51	5.641	53.33	1.4	0.62	776	0.384	6.641	0.239	1.623	205	0.068724
2010CS016	1.98	2.3	21.47	3.8	0.054	68.6	0.28	7.412	71.62	18.3	1.49	794.5	0.461	4.07	0.353	1.291	155	0.090145
2010CS017	1.27	1.58	17.87	2.67	0.007	31.3	0.83	3.167	44.2	2.1	0.45	623.7	0.2	2.73	0.197	0.93	91	0.070867
2010CS018	1.39	1.244	18.53	2.82	0.019	25.4	0.82	5.081	57.01	4.4	0.74	562	0.64	2.883	0.26	1.644	99	0.101441
2010CS019	1.39	2.79	18.16	3.39	0.01	35	1.01	4.464	68.6	4.5	0.56	634.1	0.27	4.539	0.392	0.791	125	0.108185
2010CS019A	1.28	1.856	17.96	3.25	0.018	23.1	0.92	4.567	54.84	6.3	0.67	655.9	0.36	4.807	0.258	0.974	116	0.08361
2010CS020	1.52	2.574	19.21	3.51	0.025	37.5	0.71	7.658	75.87	7.5	0.87	498.4	0.834	10.275	0.326	3.155	125	0.152227
2010CS021	1.27	0.855	16.5	2.75	0.008	18.5	0.85	3.914	70.55	2.9	0.51	554.1	0.287	3.413	0.282	0.563	102	0.127324
2010CS022	1.35	0.936	19.62	3.24	0.015	25	0.71	5.591	41.01	4.1	0.8	706.1	0.602	2.305	0.166	1.107	124	0.05808
2010CS023	1.29	2.026	20.68	3.23	0.023	56.8	0.42	6.329	50.52	5.6	0.88	539	0.688	6.412	0.286	1.849	121	0.093729
2010CS024	1.51	1.814	19.8	4.57	0.012	36.6	1.51	3.746	57.82	3.4	0.75	302.2	0.204	3.423	0.295	0.759	160	0.19133
2010CS025	1.95	6.379	20.31	3.17	0.009	5.2	1.38	6.582	230.22	2	0.91	15.8	1.212	28.424	1.006	11.051	83	14.57089
2010CS026	0.91	1.935	14.85	1.12	0.003	4.2	1.17	1.121	201.24	1.1	0.25	201.7	0.2	15.098	0.936	1.823	27	0.997719
2010CS004A	1.04	2.349	18.71	3.83	0.018	38.1	0.93	5.53	83.66	3.1	0.89	408.9	0.424	5.077	0.421	0.998	148	0.204598
2010CS021 SP	1.3	0.859	16.57	2.76	0.009	18.5	0.87	4.074	69.45	3.3	0.52	553.6	0.308	3.698	0.282	0.576	101	0.125452
2010CS045	1.11	2.434	14.19	3.07	0.007	10.9	1.67	4.087	173.08	1.6	0.61	200.5	0.513	14.505	0.825	1.006	99	0.863242
2010CS046	2.19	6.006	19.15	3.19	0.008	8.4	1.04	16.237	219.17	3	1.07	39.4	2.44	24.852	0.974	7.109	72	5.56269
2010CS047	1.95	3.026	18.33	4.86	0.011	12.1	1.3	8.212	153.49	2.5	1.07	88.8	0.878	35.587	0.692	6.689	134	1.728491
2010CS048	1.41	2.411	16.25	4.96	0.012	20.3	1	8.61	197.05	2.8	1.12	127.3	0.806	26.116	0.898	3.046	160	1.547918
2010CS049	2.04	3.423	19.1	1.84	0.012	13.5	2.5	8.964	217.06	2.7	1.04	91.3	1.536	12.108	1.049	3.083	40	2.377437
2010CS051	1	3.872	14.67	2.4	0.009	10.8	1	4.337	171.79	2.8	2.42	321.4	0.656	16.776	0.836	8.576	61	0.534505
2007CS009	20.55	89.203	177.79	0.91		648.7	2.25	>200	>300	5.3	124.01	<2	23.4	0.34	9.515	0.24	14	
2007CS010	3.16	9.169	25.26	0.3		40.5	0.52	14.48	>300	1.5	5.58	23	1.3	1.11	2.195	0.37	8	
Av. of samples 010 to 051	1.4484	2.348	18.4568	3.2392	0.01672	25.624	0.9492	6.166	106.0876	4.708	0.8788	431.892	0.6534	10.19348	0.4898	2.65708	108.4	0.245635

Analyses by Geoscience Laboratories, Ministry of Northern Development, Mines and Forestry, Sudbury, Ontario

South Austin Zone (A. Lichtblau and S. McDonald)

The integrated mapping, geochronologic and lithogeochemical projects carried out during the federal–provincial NATMAP program in the Red Lake greenstone belt from 1999 to 2004 significantly advanced the understanding of the geological history of the belt. Key outcrops elucidating the 300 Ma history of the belt include the surface expression of the main ore zone ("South Austin Zone") of Claude Resources Inc.'s past-producing Madsen Mine (produced 2.5 million ounces Au between 1938 and 1999; see Table 3), which is interpreted to occupy the position of the unconformity between Mesoarchean Balmer Assemblage and Neoarchean Confederation Assemblage (Sanborn-Barrie et al. 2001).

Geological field tours of the Red Lake mining camp have been given since the start of the Red Lake office of the Resident Geologist Program in 1968. The South Austin Zone outcrop has become an important field trip stop since NATMAP re-interpretation of local geology, illustrating the complex interplay of lithology, alteration, deformation and economic gold mineralization. The series of poorly exposed hillside outcrops are located approximately 600 m southwest of the Madsen shaft (Figure 10). They were mechanically stripped in the fall of 2009, and power-washed and channel-sampled by S. McDonald in the summer of 2010. The exposure is now complete from Austin Zone footwall, through Confederation Assemblage quartz-feldspar rhyolite, to overlying Huston conglomerate (Figure 11). Following is a preliminary description of the lithology and geochemistry of the exposure.

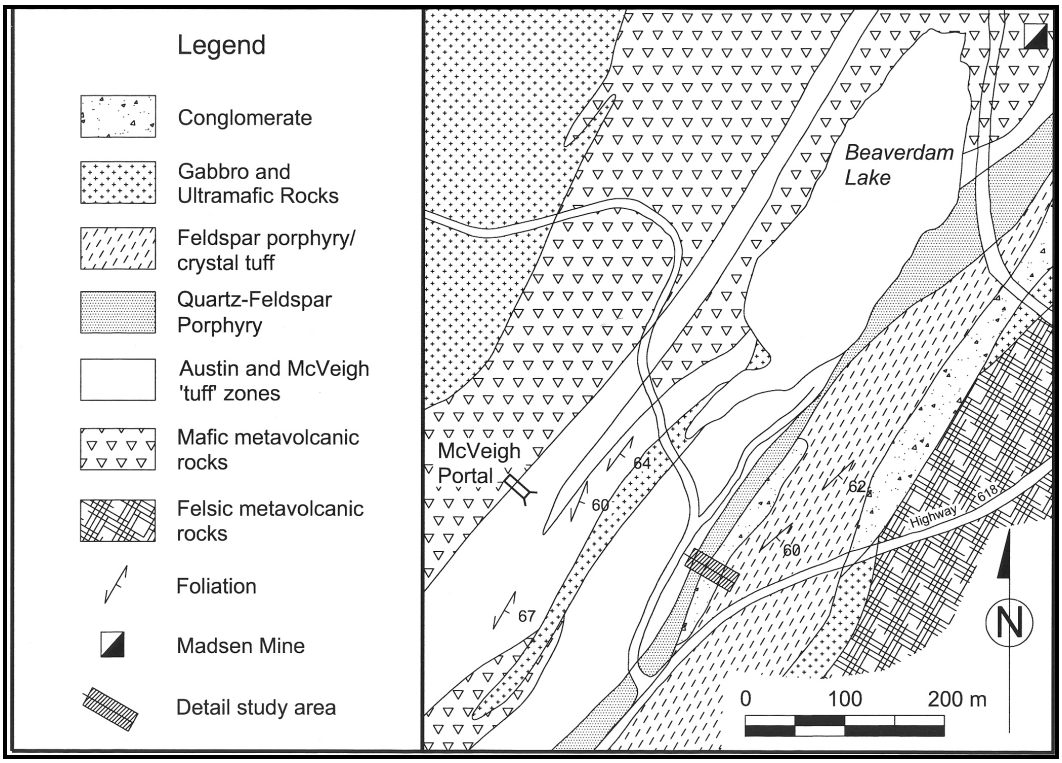


Figure 10. Location of the South Austin Zone (*adapted* from Dubé et al. 2000).

The base of the exposure is a well banded/layered, locally contorted, example of Austin "tuff", from which the bulk of the 2.5 million ounces Au of the Madsen deposit were mined. At this locality, the Austin Zone is a strongly altered (biotite, amphibole, garnet) mafic volcaniclastic/epiclastic rock, with up to 20% wacke/tuff (?) clasts, occupying the position of the unconformity between Balmer and Confederation assemblages. Major oxide chemistry (Table 16), uncorrected for alteration, indicates that 11 of 12 samples collected from this unit are tholeiitic (Irvine and Baragar 1971, Figure 2). A minimum age on the deposit is 2699 ± 4 Ma (Corfu and Andrews 1987), the age of a crosscutting post-ore granodiorite dike (not exposed at this locality).

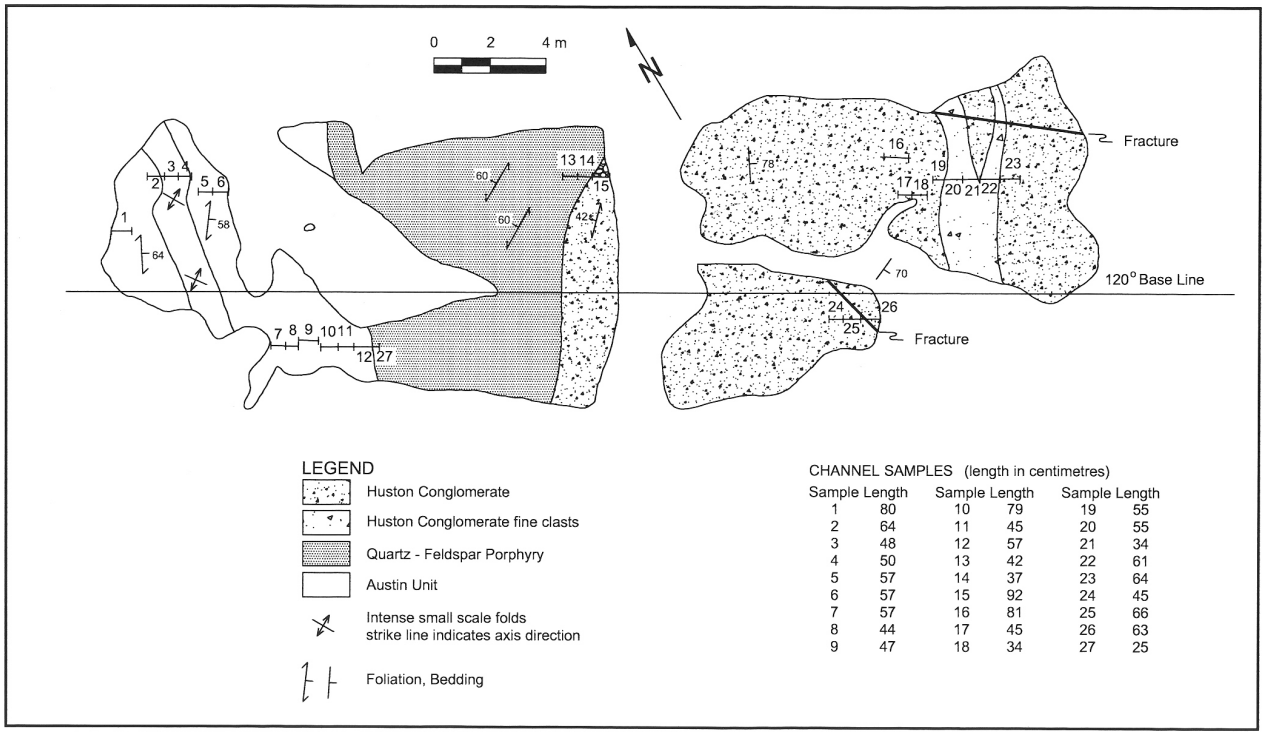


Figure 11. Detail of stripping and sampling, South Austin Zone. Sample series 2010SM-01 through 2010SM-27.

Weakly to moderately foliated quartz-feldspar rhyolite porphyry ("QFP") forms the structural and stratigraphic hanging wall of the deposit and marks the beginning of Confederation Assemblage time (McNeely sequence of Sanborn-Barrie et al. 2001). Contact with the underlying Austin Zone is sharp, with the Austin Zone characterized by an 80 cm-wide transition zone of contorted and brecciated rock. Whole rock analyses of two samples of porphyry plot in the calc-alkaline rhyolite field of Jensen (1976, Figure 1).

Overlying the quartz-feldspar rhyolite is a conglomerate unit, part of the Huston Assemblage, which yielded a single peak in detrital U-Pb zircon ages of ≤2746 Ma from an exposure approximately 15 km to the northeast (Sanborn-Barrie et al. 2001). Fragments are generally intermediate to mafic, with a mafic biotite-garnet-andalusite altered matrix. Major oxide chemistry (*see* Table 16), uncorrected for alteration, indicates that the 4 samples collected from this unit are of tholeiitic affinity (Irvine and Baragar 1971, Figure 2). Tables 14 and 15 show the trace element analyses for samples collected during this study.

Table 14. Trace element analyses (in ppm) of South Austin Tuff samples (sample number prefix is 2010SM, i.e., 2010SM-01).

Sample No.	-01	-02	-03	-04	-05	-06	-07	-08	-09	-10	-11	-12
Rock Type	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin
Rb	100.79	64.46	73.7	108.19	115.67	104.61	70.52	122.2	109.1	96.68	82.53	142.82
Ba	259.6	199.3	357.5	282.5	264.8	275.1	226.6	249.2	245.9	125.7	166.2	190.8
Sr	31	80	126	98	77	65	41	44	41	6	9	9
Sc	43.3	34.7	42.2	40.1	53.7	51.8	42.9	50.9	53.2	47.9	32.3	31.1
La	5.64	5.4	7.39	6.8	7.66	7.31	6.26	6.58	7.24	11.35	7.01	9.96
Ce	14	13.14	18	16.56	18.96	17.77	16.23	17.16	17.23	24.24	15.08	20.37
Nd	9.5	8.75	12.05	11.61	12.64	11.81	11.37	11.16	11.77	15.18	9.49	12.27
Sm	2.9	2.82	3.8	3.72	3.98	3.58	3.72	3.44	3.55	4.14	2.57	3.11
Eu	1	1.19	1.29	1.25	1.4	1.33	1.45	1.24	1.18	1.37	0.81	0.79
Gd	3.71	3.73	5.03	4.96	5	4.67	4.99	4.1	4.46	4.95	2.89	3.7
Tb	0.686	0.655	0.889	0.896	0.895	0.821	0.925	0.738	0.839	0.863	0.482	0.629
Yb	3.412	2.886	4.092	4.013	3.822	3.41	3.959	3.702	4.158	4.356	2.054	2.415
Lu	0.52	0.43	0.61	0.59	0.57	0.5	0.6	0.57	0.63	0.69	0.31	0.36
Y	28.23	26.63	36.82	36.72	34.9	31.92	38.04	29.44	34.11	34.81	18.05	24.04
Zr	103	54	38	47	99	105	74	106	99	77	67	81
Th	0.99	0.71	0.99	0.96	1.01	1	0.94	1.03	0.95	1.01	0.7	0.97
U	0.25	0.22	0.26	0.25	0.22	0.24	0.24	0.28	0.23	0.25	0.25	0.37
Hf	2.97	1.61	1.3	1.41	2.8	3.05	2.13	3	2.78	2.19	1.99	2.36
Nb	4.13	2.91	4.16	4	4.25	4.1	3.78	4.24	3.92	3.88	2.86	4.28
Ta	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3
Cs	6.25	2.95	2.16	4.1	6.12	5.41	2.99	6.22	5.39	6.27	3.7	6.08
Dy	4.74	4.53	6.15	6.14	6.04	5.58	6.34	5.17	5.87	5.94	3.14	4.15
Er	3.18	2.97	4.15	4.04	3.85	3.47	4.15	3.57	3.99	4.08	2.04	2.6
Ho	1.04	0.98	1.34	1.33	1.28	1.18	1.37	1.14	1.29	1.32	0.67	0.88
Pr	1.98	1.91	2.6	2.4	2.68	2.54	2.39	2.39	2.51	3.39	2.11	2.79
Tm	0.489	0.438	0.61	0.598	0.573	0.513	0.596	0.543	0.604	0.63	0.3	0.371
Be	0.69	3.06	2.23	1.94	1.24	0.87	0.62	0.52	0.49	0.23	0.28	0.75
Cd	0.11	0.1	0.13	0.07	0.07	0.08	0.21	0.12	0.16	0.28	0.07	1.86
Ga	20.34	18.27	20.93	20.51	22.75	22.26	19.38	22.42	20.46	18.14	14.51	18.55
Li	46	20.7	20.6	29.2	40.2	37.4	19.7	38.2	30	26.2	21.1	26.2
Mo	1.25	1.47	1.07	1.21	0.63	0.48	0.51	0.49	0.47	0.66	0.77	1.22
Sb	0.76	2.44	3.46	2.03	0.82	0.8	1.95	1.09	0.97	0.71	0.78	1.14
Sn	0.87	0.83	0.73	0.87	0.75	0.91	0.84	0.81	0.93	0.73	0.67	0.58
Tl	0.52	0.33	0.33	0.51	0.55	0.5	0.37	0.59	0.54	0.52	0.41	0.86
V	403.74	251.4	410.39	398.18	453.66	429	399.06	431.52	420.2	433.06	227.59	267.23
W	9.61	67.03	63.65	45.25	18.88	9.16	19.03	3.21	2.3	3.4	9.59	11.86
Zn	105.7	66.58	81.62	77.45	91.71	69.39	173.52	121.95	108.11	107.27	34.15	388.81
Pb	3.5	3.5	3.7	2.8	2.9	3.1	3.4	2.2	2.7	6.2	2	21.4
Cu	45	74	64	75	114	86	135	107	69	86	37	182
Cr	113	90	111	116	118	116	104	117	111	106	154	162
Ni	87	67	89	100	94	94	70	84	78	75	118	127
Co	44.7	34.9	50.9	52.7	52.7	57.1	43.7	51.9	44.5	39.5	33.1	38.8
Bi	0.031	0.065	0.105	0.086	0.032	0.033	0.083	0.051	0.077	0.066	0.036	0.128
Ti	9630.2	6115.15	9527.75	9381.44	10239.1	10082.4	8816.34	10119.2	9356.36	9089.29	5094.75	6837.98

Analyses by Geoscience Laboratories, Ministry of Northern Development, Mines and Forestry, Sudbury, Ontario.

Table 15. Trace element analyses (in ppm) of QFP and Huston conglomerate samples (sample number prefix is 2010SM, i.e., 2010SM-13). Analyses for samples 2010SM-25 and -26 are pending. Analyses for Au, Pd and Pt are pending.

Sample No.	-13	-14	-15	-16	-17	-18	-19	-20	-21	-22	-23	-24
Rock Type	QFP	QFP	Huston	Huston	Huston	Huston	Huston	Huston	Huston	Huston	Huston	Huston
Rb	85.22	74.47	107.78	68.11	64.93	63.87	77.81	77.86	61.36	63.04	53.71	66.62
Ba	722	569.1	495.9	283.4	271.4	584.6	334.3	293.1	250.6	276.9	273.8	261.1
Sr	73	54	217	40	38	77	80	66	56	44	40	41
Sc	5	4	28.5	41.4	37.7	21	28.2	35.7	39.3	45.1	39.9	42.9
La	27.9	20.46	23.3	6.55	7.12	20.45	14.54	7.78	6.57	9.42	7.56	7.78
Ce	52.26	38.29	45.04	14.46	16.56	39.34	27.97	15.81	14.82	20.41	16.52	17.22
Nd	15.14	11.48	17.35	8.39	10.47	15.7	12.19	7.91	8.24	10.52	9.11	9.99
Sm	2.26	1.63	3.29	2.28	3.17	3.09	2.72	2	2.25	2.68	2.42	2.57
Eu	0.58	0.44	1.09	0.82	0.97	0.91	0.76	0.95	0.86	0.87	0.81	0.91
Gd	1.75	1.25	3.04	2.84	4.61	2.69	2.72	2.38	2.77	3.08	2.95	3.12
Tb	0.277	0.199	0.494	0.494	0.818	0.429	0.45	0.426	0.495	0.554	0.505	0.552
Yb	1.037	1.012	1.888	2.086	3.384	1.512	1.624	1.902	2.127	2.398	2.163	2.297
Lu	0.16	0.15	0.29	0.32	0.51	0.23	0.25	0.29	0.33	0.36	0.33	0.35
Y	10.83	8.66	18.68	18.81	35.54	14.91	16.06	16.41	19.34	21.67	19.85	21.14
Zr	125	122	109	72	73	132	87	86	81	98	75	74
Th	12.36	12.32	6.33	1.06	1	8.18	3.38	2.67	1.46	2.37	1.26	1
U	2.36	2.2	1.52	0.38	0.32	2.98	1.06	0.79	0.51	0.73	0.34	0.33
Hf	3.72	3.64	3.19	2.13	2.11	3.74	2.42	2.48	2.39	2.71	2.12	2.17
Nb	4.69	4.46	4.26	3.39	3.25	5.71	4.1	3.9	3.72	4.59	3.48	3.63
Ta	0.4	0.4	0.4	0.2	0.2	0.6	0.3	0.3	0.3	0.3	0.2	0.2
Cs	1.09	1.28	4.78	2.33	2.25	1.56	2.39	1.85	1.82	2.1	1.8	2.38
Dy	1.76	1.35	3.2	3.31	5.53	2.7	2.81	2.89	3.32	3.7	3.43	3.69
Er	1.08	0.93	1.97	2.1	3.66	1.57	1.69	1.88	2.13	2.4	2.21	2.33
Ho	0.36	0.3	0.67	0.7	1.22	0.55	0.59	0.61	0.72	0.8	0.73	0.78
Pr	4.68	3.59	4.84	1.93	2.29	4.43	3.22	1.94	1.93	2.57	2.13	2.28
Tm	0.157	0.144	0.285	0.31	0.518	0.229	0.248	0.288	0.324	0.354	0.326	0.349
Be	1.04	1.11	1.4	0.82	0.65	1.14	0.61	0.61	0.74	0.76	0.46	0.57
Cd	0.03	0.03	0.37	0.69	1.17	0.19	0.27	0.37	0.8	0.39	0.28	0.79
Ga	16.27	15.14	16.66	13.94	14.33	21.19	16.76	16.31	15.24	14.44	9.8	11.78
Li	17.9	18.6	26.7	24.9	26.7	33.5	30.1	25.5	27.9	44.6	25.6	24.3
Mo	1.52	1.05	1.51	1.14	0.93	1.33	1.66	1.81	1.43	1.11	1.06	0.96
Sb	0.34	0.22	0.93	1.25	1.15	0.62	0.61	1.13	1.42	1.49	1.02	0.74
Sn	0.73	0.73	0.8	0.58	0.54	0.87	0.8	0.7	0.56	0.62	0.69	0.59
Tl	0.31	0.29	0.55	0.36	0.32	0.28	0.39	0.35	0.3	0.33	0.29	0.37
V	18.54	12.18	189.3	284.59	263.86	145.66	202.73	249.17	270.06	307.75	270.75	288.7
W	1.76	3.9	2.3	2.43	1.98	3.05	1.39	1.62	1.57	1.46	1.34	2.16
Zn	21.37	26.71	139.65	105.4	131.72	51.19	77.43	99.6	101.71	50.85	30.67	72.94
Pb	6.5	4.8	8.1	9.7	8.8	5.6	5.1	6.6	8.2	4.7	5.7	6
Cu	4	3	382	235	199	44	172	191	191	225	145	197
Cr	32	<24	190	466	326	122	343	428	397	502	388	334
Ni	14	19	119	193	162	76	131	136	162	232	154	170
Co	3.7	5	38.6	62.7	55.8	25.5	39.4	37	53	62.7	47.3	58
Bi	0.024	0.061	0.024	0.088	0.104	0.028	0.088	0.106	0.123	0.086	0.102	0.05
Ti	1274.8	1039.0	4366.4	5646.3	5878.0	3920.6	4674.2	5442.6	6041.0	7120.2	5825.7	6060.0

Analyses by Geoscience Laboratories, Ministry of Northern Development, Mines and Forestry, Sudbury, Ontario.

Table 16. Major element chemistry of all lithologies, South Austin Tuff exposure. Analyses for samples 2010SM-25 and -26 are pending.

Sample No.	Rock Type	SiO2 (%)	TiO2 (%)	Al2O3 (%)	Fe2O3 (%)	K2O (%)	MgO (%)	MnO (%)	CaO (%)	Na2O (%)	P2O5 (%)	LOI (%)	Total (%)
2010SM-01	Austin	54.33	1.67	15.68	15.38	4.66	3.55	0.37	1.72	0.55	0.15	1.65	99.71
2010SM-02	Austin	52.45	1.07	14.35	14.45	2.34	4.37	0.32	6.79	0.38	0.12	2.26	98.90
2010SM-03	Austin	46.23	1.64	15.22	14.31	3.34	4.97	0.40	10.25	0.20	0.18	2.51	99.23
2010SM-04	Austin	52.95	1.61	15.44	12.90	3.65	4.14	0.28	6.61	0.17	0.18	2.51	100.43
2010SM-05	Austin	53.84	1.68	16.44	11.79	4.37	3.93	0.21	4.47	0.29	0.20	2.39	99.60
2010SM-06	Austin	54.55	1.69	16.71	10.66	4.35	4.03	0.21	4.40	0.34	0.20	2.33	99.48
2010SM-07	Austin	47.39	1.53	14.45	16.10	2.61	5.92	0.45	8.57	0.36	0.16	2.12	99.67
2010SM-08	Austin	49.95	1.69	16.48	15.00	4.74	4.29	0.27	3.86	0.25	0.20	2.79	99.52
2010SM-09	Austin	53.44	1.59	15.49	14.73	4.36	3.74	0.27	3.33	0.21	0.19	2.37	99.71
2010SM-10	Austin	50.62	1.55	14.95	23.23	3.62	3.11	0.48	0.45	0.04	0.17	1.23	99.46
2010SM-11	Austin	64.42	0.86	14.08	12.20	3.57	1.89	0.27	0.24	0.05	0.10	1.76	99.44
2010SM-12	Austin	58.16	1.13	14.19	15.78	4.65	2.30	0.39	0.36	0.04	0.14	2.01	99.15
2010SM-13	QFP	74.89	0.21	14.08	1.64	3.79	0.74	0.04	1.53	1.01	0.03	1.83	99.80
2010SM-14	QFP	76.14	0.17	13.28	2.27	3.27	0.82	0.04	1.17	1.08	0.03	1.78	100.05
2010SM-15	Huston	62.92	0.72	14.84	8.94	3.45	2.79	0.15	2.65	1.88	0.05	1.42	99.83
2010SM-16	Huston	60.37	0.97	14.21	15.04	2.55	3.33	0.29	1.46	0.20	0.07	1.49	99.99
2010SM-17	Huston	59.94	0.99	13.16	16.81	2.34	2.98	0.42	1.58	0.21	0.06	1.04	99.54
2010SM-18	Huston	64.49	0.67	16.82	7.53	2.93	2.24	0.14	2.11	0.84	0.08	1.99	99.84
2010SM-19	Huston	64.50	0.80	13.64	9.40	2.80	2.85	0.17	2.62	0.90	0.07	1.26	99.01
2010SM-20	Huston	62.65	0.94	13.46	12.23	2.73	3.01	0.20	1.85	0.46	0.06	2.23	99.82
2010SM-21	Huston	60.95	1.05	13.82	14.09	2.22	3.10	0.22	1.65	0.33	0.06	1.40	98.89
2010SM-22	Huston	60.45	1.21	14.48	14.76	2.22	3.38	0.19	1.11	0.29	0.06	1.26	99.40
2010SM-23	Huston	63.56	1.04	13.74	14.01	2.05	2.93	0.28	0.98	0.28	0.06	0.99	99.92
2010SM-24	Huston	58.64	1.04	14.61	16.14	2.53	3.08	0.33	1.52	0.27	0.08	0.68	98.92

Analyses by Geoscience Laboratories, Ministry of Northern Development, Mines and Forestry, Sudbury, Ontario.

RECOMMENDATIONS FOR EXPLORATION

Rare Metals

Rare metal pegmatites along the Uchi Domain – English River Basins boundary have been described by Breaks, Selway and Tindle (2001, 2003) and Lichtblau et al. (2003) from the Jubilee Lake area in Birkett Township. Highly fractionated pegmatitic rocks associated with the Allison Lake batholith in eastern Birkett Township form an attractive target for rare metal exploration. Breaks, Selway and Tindle (2001) also re-evaluated the McCombe pegmatite in the Root Lake area and found significant Ta mineralization. This result, as well as Ta values reported by Storey et al. (2000), also from the Root Lake area, indicate significant rare metal exploration potential in pegmatitic rocks hosted in mafic metavolcanics of the Uchi Subprovince north of the Lake St. Joseph fault. Recent exploration work on the former Consolidated Morrison Explorations property near Root Lake by H.W. Watts has confirmed the presence of anomalous lithium values (2.49% Li_2O and 5.91% Li_2O) (assessment files, Red Lake Resident Geologist's Office). The area of interest includes the western and southern margins of the Allison Lake batholith; the eastern tail of the batholith that extends east-southeast from Birkett Township; and the pegmatite dikes hosted in mafic metavolcanic rocks along the south margin of the Uchi Subprovince, proximal to the English River subprovince boundary.

The Pakeagama Lake pegmatite field, located on the Bearhead Fault that separates the former Berens River and Sachigo subprovinces (now the North Caribou Core of the North Caribou Terrane of Stott et al. (2010)) in the Red

Lake District, has been explored in recent years by Houston Lake Mining. In other parts of the Bearhead Fault zone, mapping by Ayres (1970) indicated beryl southwest of Setting Net Lake, and a compilation by Ayres et al. (1973) indicated lithium at two locations in the same area. Recent mapping by Stone, Crawford and Halstead (1993) and Stone, Fogal and Fitzsimon (1993) confirmed this. The entire Bearhead Fault zone warrants exploration for rare-metal pegmatites, particularly in the area between Favourable Lake and Pakeagama Lake.

In addition to the rare metal pegmatites there is one reported rare earth occurrence in the Carb Lake Carbonatite complex (Sage 1987). Other alkalic rock complexes may also have rare earth potential but have not been explored for rare earths.

Iron

Iron was produced from the Griffith Mine at the Uchi–English River subprovince boundary from 1968 to 1986. Total production for the mine was 22 850 000 tons of pellets grading 66.7% Fe. There is an estimated 120 000 000 tons of iron-bearing rock grading 29% iron remaining (MDI#52K14SW00002). Iron has recently become an exploration target due to increased commodity prices and technology changes that have made iron-making a more attractive possibility. Iron formation along the Uchi domain – English River Basins boundary (Bluffy Lake, Kesaka Lake, Ogani Lake and Papaonga Lake) has been known for many years and some of these occurrences are current exploration targets (*see* "Exploration Activity"). Table 18 indicates which of these have some form of historical resource estimate. Concentrations of iron-bearing rock (iron formation) occur in other greenstone belts, most notably at North Spirit Lake in the North Caribou Terrane, where an historical resource estimate of 1.3 million tons per vertical foot of 33.94% Fe was published (Wood 1977).

Copper-Nickel-Platinum Group Elements

Exploration for platinum group metals intensified in the Red Lake belt after the discovery of significant palladium and nickel values by Goldcorp Inc. and Rubicon Minerals Corp. in 2000, then declined as gold exploration became predominant. Copper-nickel has not been produced from the Red Lake or Birch–Uchi greenstone belts, but nickel (and possible associated PGE) mineral occurrences have been reported from several mafic intrusive bodies. Base metal sulphide mineralization is associated with massive, layered and brecciated gabbros and peridotitic intrusive rocks found in several greenstone belts north of Red Lake. Historically, platinum group element assaying was not performed on these occurrences. Most of these areas are open for staking. A recent compilation by Puumala and Bennett (2011) lists several nickel occurrences in greenstone belts north of Red Lake. Sanukitoid-type intrusive bodies have been identified in the Red Lake greenstone belt (Faulkenham Lake Stock, Sanborn-Barrie et al. 2004) and in some parts of the Berens River and Sachigo subprovinces to the north (Stone 2005). These have now been incorporated in the North Caribou Terrane of Stott (2010). Their potential to host copper-nickel-PGE mineralization is unknown at the present. Stott et al. (2010) indicate that tectonic conditions that created the Oxford–Stull domain could have formed mantle-derived magmatic sulphide deposits associated with mafic to ultramafic intrusive rocks.

Gold in the Dome Stock

Recommendations put forward in last year's Report of Activities (Lichtblau et al. 2010, p. 28-29) focussed on gold mineralization in the Dome stock. Recent successful exploration work near the southern and northern margins of the Dome stock has increased the potential of developing large tonnage, low-grade gold deposits. Mega Precious Metals Inc., on its North Madsen properties (*see* "Mega Precious Metals Inc." write-up in "Exploration Activity"), revealed extensive, low-grade gold mineralization within a 5 m wide mafic dike (the Laverty Dike zone) and surrounding Dome granodiorite stock. An NI43-101 compliant indicated resource of 395 000 t at 2.56 g/t Au, plus an additional inferred resource of 32 000 t at 3.32 g/t Au on the Laverty Dike zone (open pit and underground, above 100 m depth) was calculated with data from holes drilled to the end of April, 2010 (Harron and Puritch 2010).

On its McKenzie Island property, Crown Gold Corporation completed channel sampling and 10 diamond drill holes (totalling 661 m) testing auriferous quartz veins along the western contact of a 155º trending mafic dike that cuts the Dome granodiorite stock (*see* details in Table 5, entry No. 7). Both dikes fall into a southeasterly trending set defined previously by Blackburn et al. (1999); e.g., Skookum: 150º; Laverty: 150º; Red Lake Gold Shore: 145º; Buffalo: 119º; Pine Island: 160º.

Explorationists should focus on defining structures and mafic dikes, perhaps with the aid of high-definition magnetic surveys; a dextral offset across the southeasterly trending structures was noted by Blackburn et al. (1999). The Howey "diorite" and deeper, untested portions of the Mackenzie stock, both late plutons emplaced within the greenstone belt, should also be added to the explorationist's target list.

The sheared southern contact of the Dome stock hosts a number of past-producers, deposits not being mined and gold occurrences (Figure 12). Along a 10 km stretch from west to east, one finds: 1) St. Paul's Bay (Busch 2005); 2) Buffalo Deposit (*see* Table 18); 3) Laverty Dike Zone (*see* Table 18); 4) Red Lake Goldshore Mine (*see* Table 3); 5) Hasaga Mine (*see* Table 3); 6) Howey Mine (*see* Table 3); 7) Whitehorse Island deposit (*see* Table 18). Companies actively engaged in exploration around the southern peripheries of the stock in January of 2011, include Rainbow Resources Inc., Sabina Gold & Silver Corporation, Mega Precious Metals Inc. and Sphere Resources Inc.

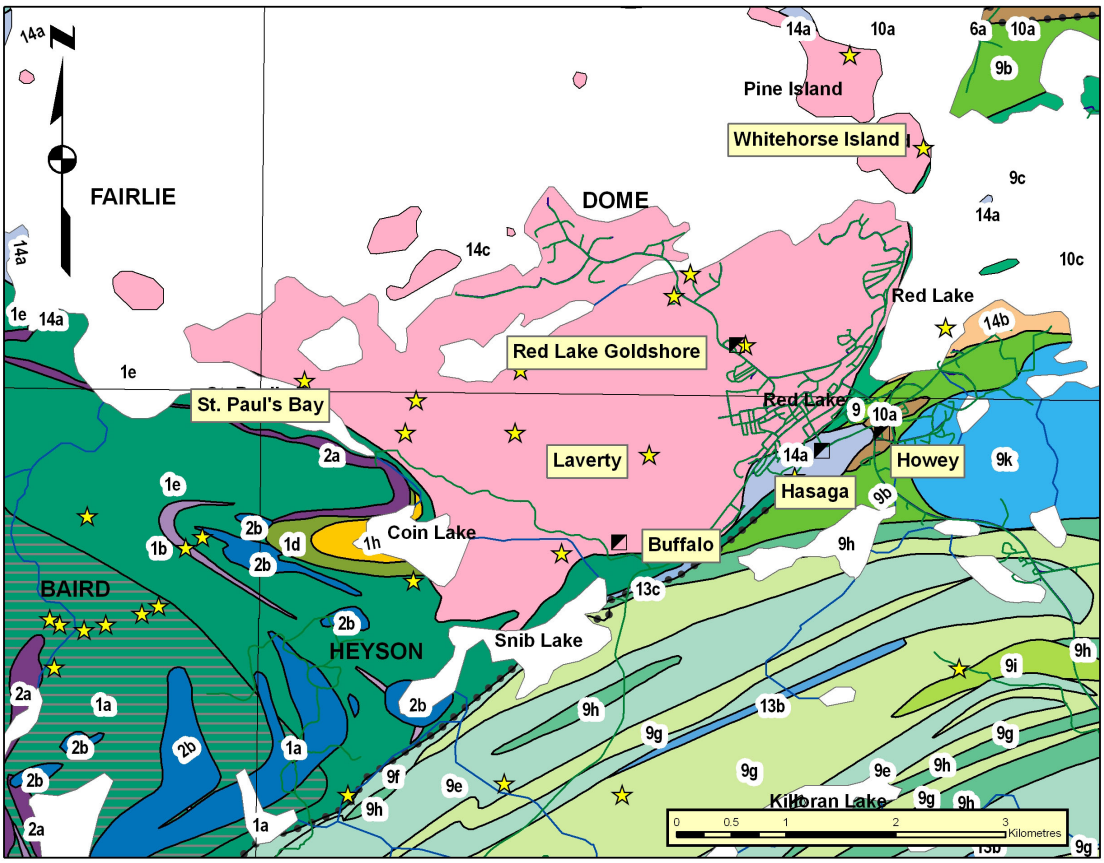


Figure 12. Location of Dome stock, central Red Lake greenstone belt, and locations mentioned in text. Legend: ◪ Present and past-producing gold mine; ★ Gold occurrence or prospect (*adapted from* Sanborn-Barrie, Skulski and Parker 2004).

OGS ACTIVITIES AND RESEARCH BY OTHERS

Publications received in the Red Lake Resident Geologist office during 2010 are listed in Table 17. Research activities in the Red Lake District in 2010 are listed below. A location map, keyed to the activity letters, is shown in Figure 13. There were no OGS Precambrian Geoscience Section field activities in the Red Lake Resident Geologist District this year but the Far North Land-Use Planning Initiative geoscience work is continuing (Fyon 2010).

A. Kristyn Rodzinyak (McGill University) began preparatory work for a thesis project tentatively titled "Sulphur Isotopes as a Proxy for Archean Atmosphere".

B. R. Murphy (University of Manitoba) produced a report entitled "An Interpretive Report of the Red Lake Gold Mine Based on a Structural and Petrographic Study of 37 Level Track".

C. Sian Marsden at (Queens University) is working on her second year of an MSc thesis on the Cochenour/Gold Eagle mineralization.

D. Shaun Gallagher (University of Manitoba) started MSc research focusing on the south end of the East Bay Trend.

E. Mike Tucker (Laurentian University) completed a mapping/structural/geochemical study for a BSc thesis on a new stripped area north of Cochenour (Marboy property).

In addition, K. Williamson continued his PhD work at INRS-ETE, Université Laval on the Goldcorp Red Lake Mine deposit, and Lizzie Stock continued her PhD work at University of British Columbia on proximal alteration systematics along the Red Lake Gold Mines "Mine Trend".

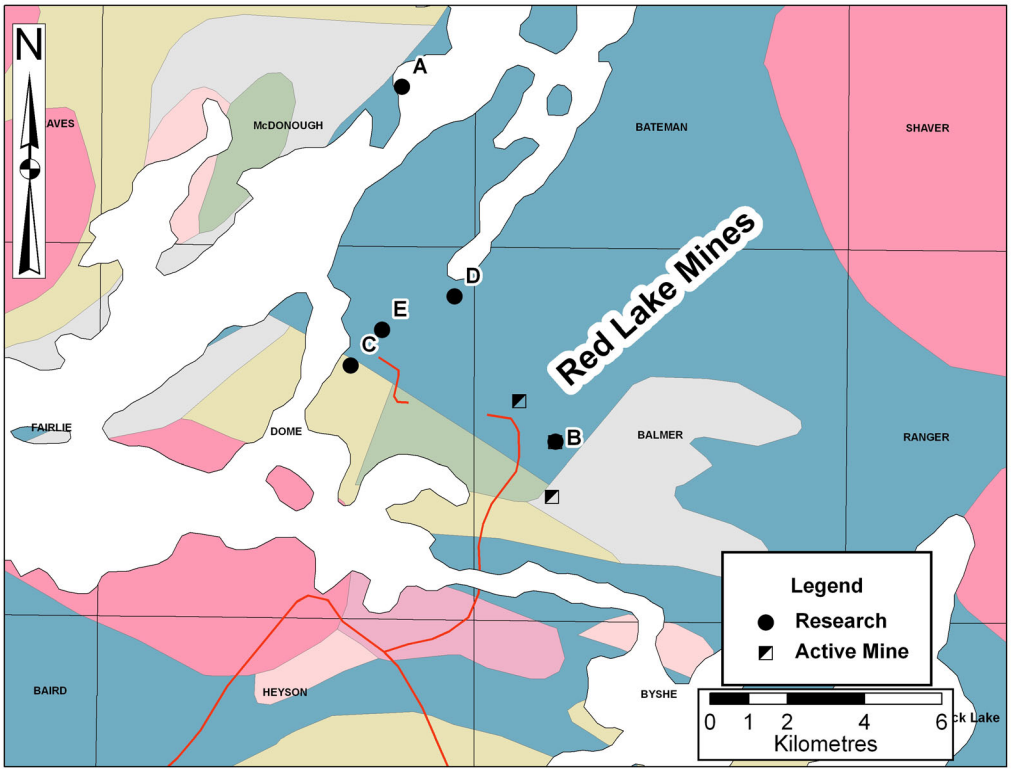


Figure 13. Location of OGS and other research projects in the Red Lake District in 2010.

Table 17. Publications received by the Red Lake Resident Geologist Office in 2010.

Title	Author	Type and Year of Publication
Komatiite	N. Arndt, C.M. Lesher and S.J. Barnes	Cambridge University Press, 2008
The Mining Act of Ontario (1925 consolidation for use by prospectors and the public)		The Legislative Assembly of Ontario, 1925
At the End of the Road	R. Edwards and E. Piotrowski	Unpublished preliminary print (no date)
Report of Activities, 2009, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora District	A. Lichtblau, C. Ravnaas, C.C. Storey, H.C. Lockwood, S. McDonald and J. Bongfeldt	Ontario Geological Survey, Open File Report 6244, 2010
Report of Activities, 2009, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North District	M.C. Smyk, G.D. White and H.C. Lockwood	Ontario Geological Survey, Open File Report 6245, 2010
Report of Activities, 2009, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	J.F. Scott, D.A. Campbell, H.C. Lockwood, M.R. Brunelle and R. Pelaia	Ontario Geological Survey, Open File Report 6246, 2010
Report of Activities, 2009, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	B.T. Atkinson, A. Pace, S.A. Beauchamp, P. Bousquet, S. Butorac, D.M. Draper and A.C. Wilson	Ontario Geological Survey, Open File Report 6247, 2010
Report of Activities, 2009, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake District	D.L. Guindon, G.P.B. Grabowski, A.C. Wilson and D.P. van Zeyl	Ontario Geological Survey, Open File Report 6248, 2010
Report of Activities, 2009, Resident Geologist Program, Kirkland Lake Regional Geologist Report: Sudbury District	M. Cosec, D. Farrow, L.A. Bardeggia and J. Kitching	Ontario Geological Survey, Open File Report 6249, 2010
Report of Activities, 2009, Resident Geologist Program, Southern Ontario Regional Resident Geologist Report: Southeastern and Southwestern Ontario Districts, Mines and Minerals Information Centre, and Petroleum Resources Centre	P.J. Sangster, D.A. Laidlaw, P.S. LeBaron, T.R. Carter, L. Fortner and C.R. Lee	Ontario Geological Survey, Open File Report 6250, 2010
Summary of Field Work and Other Activities 2010	J.A. Ayer, R.M. Easton, G.P. Beakhouse, G.M. Stott, R.I Kelly, E.J. Debicki, J.R. Parker and T. Brown	Ontario Geological Survey, Open File Report 6260, 2010
Characterization of Hydrothermal Alteration Associated With Mineralization of the Polymetallic Zone, Madsen Area, Ontario	J. Scanlon	University of Manitoba Technical Report
Peat and Peatland Evaluation of the Dryden-Lac Seul Area, 7 Volumes (Summary Volume and Appendix Volumes A-F)	Monenco Ontario Limited	Ontario Geological Survey, Open File Report 5544, 1986
Report of Activities 2010 (CD version)	Manitoba Geological Survey	Ministry of Innovation, Energy and Mines, Manitoba Geological Survey, 2010
Eastern Ontario – Western Quebec Region Magnetic Anomaly map (Residual Total Field)	P.H. McGrath, P.J. Hood and A.G. Darnley	Geological Survey of Canada, Magnetic Anomaly Map Series, Map 1562A, 1:1 291 806, 1981
Timiskaming – Kapuskasing Region Magnetic Anomaly map (Residual Total Field)	P.H. McGrath, P.J. Hood and A.G. Darnley	Geological Survey of Canada, Magnetic Anomaly Map Series, Map 1562A, 1:1 291 806, 1981

Title	Author	Type and Year of Publication
Western Ontario Region Magnetic Anomaly map (Residual Total Field)	P.H. McGrath, P.J. Hood and A.G. Darnley	Geological Survey of Canada, Magnetic Anomaly Map Series, Map 1564A, 1:1 000 000, 1981
Surficial Geology Stull Lake Manitoba-Ontario	M.D. Clarke	Geological Survey of Canada, Map 1672A, 1:250 000, 1988
Geology North Spirit Lake Ontario	J.A. Donaldson and G.D. Jackson	Geological Survey of Canada, Map 1201A 1:253 440, 1969
Papaonga Lake Area, Kenora District (Patricia Portion)	W.I. Wright	Geological Survey of Canada, Map 347A 1:126 720, 1936
*Stull Lake Sheet (East half) Manitoba-Ontario	D.L. Downie	Geological Survey of Canada, Map 451A 1:253 440, 1938
*AGI Data Sheets, 3rd ed	J.T. Dutra, R.V. Dietrich and R.M. Foose	American Geological Institute 1989
*Tailings Management Problems and Solutions in the Mining Industry	G.M. Ritcey	Elsevier, 1989
*Determinative Tables for Ore Microscopy	C. Schouten	Elsevier, 1962
*Mineral Resource Evaluation II: Methods and Case Histories	M.K.G. Whateley and P.K. Harvey	Geological Society, Special Publication No. 74, 1994
*Geology and Petrology of the Galapagos Islands	A.R. McBirney and H. Williams	Geological Society of America, Memoir 118, 1969
*Stone in Architecture: Properties, Durability, 3rd ed	E.M. Winkler	Springer-Verlag, 1994
*The Extractive Metallurgy of Gold	J.C. Yannopoulos	Van Nostrand Reinhold, 1991
*Petrology of Lamproites	R.H. Mitchell and S.C. Bergman	Plenum Press, 1991
*Kimberlites: Mineralogy, Geochemistry and Petrology	R.H. Mitchell	Plenum Press, 1986
*Pyroclastic Rocks	R.V. Fisher and H.-U. Schmincke	Springer-Verlag, 1984
*Industrial Minerals and Their Uses	P.A. Ciullo (ed.)	Noyes Publications, 1996
*Practical Handbook of Physical Properties of Rocks and Minerals	R.S. Carmichael (ed.)	CRC Press, 1989
*Gold in the Western Shield	L.A. Clark (ed.)	CIM Special Volume 38, 1986
*Working Near Water: Considerations for Fish and Fish Habitiat, Reference and Workshop Manual - NWT	P. Cott and J.P. Moore	Canada Department of Fisheries and Oceans
*Sampling Bulk Industrial Minerals and Rocks – A Practical Approach	G.H. Edward and P.W. Harben	Metal Bulletin PLC, 1999
*Ore Reserve Estimation and Grade Control	J.E. Gill (ed.)	CIM Special Volume 9, 1968
*Restoration and Recovery of an Industrial Region	J.M. Gunn (ed.)	Springer-Verlag, 1995
*Mafic Dyke Swarms	H.C. Halls and W.F. Fahrig (eds.)	Geological Association of Canada, Special Paper 34, 1987
*Rare Earth Element Geochemistry	P. Henderson (ed.)	Elsevier, 1984
*Industrial Minerals and Rocks, 7th ed	J.E. Kogel, N.C. Trivedi, J.M. Barker and S.T. Koukowski (eds.)	Society for Mining, Metallurgy and Exploration Inc., 2006

**A number of text books and special publications were received from the former Mines and Minerals Information Centre; only a few are listed above.*

MINERAL DEPOSITS NOT BEING MINED

Table 18. Mineral deposits not being mined in the Red Lake District in 2010.

Abbreviations

AF.....Assessment Files
CMH .....*Canadian Mines Handbook*
GR .....Geological Report
MDC .....Mineral Deposit Circular
MDIR .....Mineral Deposit Inventory record
MLS .....Mining Lands, Sudbury
MR .....Mining Recorder
NM .....*The Northern Miner*
OFR.....Open File Report
PC.....Personal Communication

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status
Abino Bateman, Balmer and Dome townships (52N/04SW)	Au	Total Granodiorite zone: drill-indicated tonnage 405 162 tons 0.203 opt Au from three sub-zones	AF (McClean 1976)	Patent
Aiken–Russet Baird Township (52K/13NW)	Au	Total reserves of 102 555 tons of 0.22 opt Au	AF (Kuryliw 1967)	Patent
Alcourt (Copper Man, Hanson–Campbell) Fairlie Township (52N/04SW)	Au	Reserves: 20 000 tons of 0.45 opt Au from 1959-60 diamond drilling No. 1 vein: 17 000 tonnes of 0.2429 oz per tonne Au from 1959-60 diamond drilling and 1981 sampling program	AF (Tilsley 1981)	Patent
Annco Mine Dome Township (52N/04SW)	Au	Reserves: 50 000 tons of "Excellent Grade" (0.35 opt Au?)	Energy Mines and Resources Canada 1989	Patent
Bathurst Mine Skinner Township (52N/07SW)	Au	Reserves: 80 000 tons of 0.587 opt Au	Energy Mines and Resources Canada 1989	Leased
Bear Head Lake Prospect (53C/12NW)	U_3O_8	Reserves: 978 810 tons of 0.06% U_3O_8 to a depth of 500 feet	MDC 25 (Robertson and Gould 1983)	Staked Claim
Berens River Mine (Golsil, Zahavy) (53C/13SE)	Au, Ag, Pb, Zn	Reserves: No. 1 zone: 75 000 tons of 0.10-0.2 opt Au, 4.0-5.0 opt Ag No. 3 zone: 713 249 tons indicated of 0.249 opt Au, 4.83 opt Ag, 0.67% Pb, 1.03% Zn, 268 964 tons inferred of 0.287 opt Au, 4.73 opt Ag, 1.05% Pb 1.37% Zn at 0.15 opt Au cut-off to 750 metre level	AF (Bevan 1983)	Staked Claim
Bluffy Lake (52K/14SE)	Fe	Reserves: 21 000 000 tons at 22.86% Fe	Prelim. Map P.1199 (Breaks et al. 1976)	Licence of Occupation
Bonanza Deposit (52N/04SW)	Au	Inferred Resource: 2 283 000 tonnes of 6.98 g/t Au (NI43-101 compliant)	Premier Gold Mines Ltd., news release, February 6, 2008	Patent, Staked Claims
Borland Lake (53D/16NE)	Ag, Au	Probable Reserves: 502 412 tons of 8.09 opt Ag and 0.02 opt Au	Massive Resources Ltd., Preliminary Prospectus, August 6, 1987	Open
Buffalo Red Lake Heyson Township (52N/04SW)	Au	Reserves: 421 728 tonnes of 0.139 opt Au drill indicated in 1980	AF (Kita 1988)	Patent
Cochenour–Willans Mine Dome Township (52N/04SW)	Au	Reserves: Proven and probable 173 000 tons of 0.51 opt Au, possible reserves 274 000 tons of 0.59 opt Au	NM - Dec. 12, 1994 p.7	Patent, Licence of Occupation

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status
Cole Gold Mine Ball Township (52M/01SE)	Au	Reserves: 119 780 tons of 0.41 opt Au probable and indicated	AF (Wilton 1973)	Patent, Licence of Occupation
Consolidated Marcus Dome Township (52N/04SW)	Au	Reserves: 60 000 tons of 0.18 opt Au	Energy Mines and Resources Canada 1989	Patent
Copper Lode A–Rexdale Group Prospect (52K/15NW)	Cu, Ag	Reserves: 236 424 tons of 1.94% Cu, 1.22 opt Ag or 425 612 tons of 1.56% Cu, 0.98 opt Ag or 854 007 tons of 1.01% Cu, 0.57 opt Ag	AF (Archibald 1970) MP 152 (Atkinson, Parker and Storey 1991)	Staked Claim
Copper–Lode D Belanger Township (52K/15NW)	Cu, Zn	Reserves: 36 000 tons of 0.26% Cu, 7.58% Zn	AF (MacDougall 1996)	Leased
Copper–Lode E Belanger Township (52K/15NW)	Cu, Ag	Reserves: 160 000 tons of 8.28% Zn, 1.02% Cu, 0.39 opt Ag	AF (Archibald 1970)	Leased
Dixie Creek (52K/13SE)	Au	Reserves: 417 000 tons of 0.12 opt Au	MDIR	Staked Claim
Dixie 3 Prospect (52K/14NW)	Cu, Zn	Reserves: 91 000 tons of 10.0% Zn, 1.0% Cu	AF (MacDougall 1995)	Leased - Mining Rights Only, Staked Claim
Dixie 18 Prospect (52K/14NW)	Zn	Reserves: 110 000 tons of 0.5% Cu, 12.5% Zn, 0.57 opt Ag	AF (King and Petrie 1998)	Staked Claim
Garnet Lake Arrow Zone (52K/15NW)	Zn, Cu, Ag, Au	Indicated Resource (NI43-101) 3% Zn equivalent cut-off: 2 071 000 tonnes of 5.92% Zn, 0.75% Cu, 0.58 g/t Au, 21.1 g/t Ag, Indium average value 34.6 g/t Inferred Resource (NI43-101) 3% Zn equivalent cut-off: 120 552 tonnes of 2.60% Zn, 0.56% Cu, 0.40 g/t Au and 18.6 g/t Ag	Carter 2007	Staked Claim
GAZ Bateman Township (52N/04NE)	Au	Resource (NI43-101): 1 400 000 tonnes of 8.0 g/t Au, in 5 lenses	Wolfden Resources Inc., news release, Feb. 23, 2005	Staked Claims
Gold Eagle Mine (Western Discovery zone) Dome Township (52N/04SW)	Au	Resource (NI43-101): 309 000 tonnes at 16.67 g/t Au (uncut)	Micon International (Pressacco 2004)	Patent
Grassett Prospect Earngey Township (52N/02SE)	Au	Reserves: 78 295 tons of 0.22 opt Au (Part of the Hill–Sloan–Tivy Vein)	Energy Mines and Resources Canada 1989	Patent
Griffith Mine (52K/14SW)	Fe	Reserves: 120 000 000 tons of 29% Fe	GR 82 (Shklanka 1970)	Withdrawn from Staking
Hasaga Mine Heyson Township (52N/04SW)	Au	Reserves: C Block (below 1800 feet) - 200 203 tons of 0.192 opt Au (Ferguson 1968) Stopes - 41 430 tons of 0.104 opt Au Pillars - 6365 tons of 0.134 opt Au	GR 56 (Ferguson 1968)	Patent
Hill–Sloan–Tivy Earngey Township (52N/02SE)	Au	Reserves: 296 000 tons of 0.219 opt Au (Grassett Prospect Reserves may be included in total)	AF (Germundson 1995)	Patent
Horseshoe Island (52N/08NW)	Au	Reserves: 893 508 tons of 0.14 opt Au	*Northwest Prospector*, March/April 1990, p.27	Staked Claim
Howey Mine Heyson Township (52N/04SW)	Au	Reserves: 780 000 tons of 0.08 opt Au	Energy Mines and Resources Canada 1989	Patent, Licence of Occupation

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status
Jackson–Manion Mine Dent Township (52N/02SE)	Au	Reserves: 40 000 tons of 0.5 opt Au	NM - March 14, 1985, p.21	Patent
Joy–New zone (Diamond Willow zone, Creek zone) (52K/14NW)	Cu, Zn	Reserves: 300 000 tons of 4% combined Cu-Zn	AF (Lewis 1994)	Staked Claim
Kesaka Lake (52K/16NW)	Fe	Reserves: 312 500 000 tons of 31.1% Fe to a depth of 100 feet	MRC 11 (Shklanka 1968)	Open, Staked Claim
Laverty (Thrall) Heyson Township (52N/04SW)	Au	Reserves: 790 000 tons of 0.08 opt Au (Gillies 1982) Indicated Resource (NI 43-101): 395 000t of 2.56 g/t Au on a portion of the Laverty Dike Zone (Harron and Puritch 2010)	AF (Gillies 1982) (Harron and Puritch 2010)	Patent
Lingman Lake (53F/15SW)	Au	Reserves: 1 172 753 tons of 0.20 opt Au in all zones at 5.0 foot minimum width and a cut-off grade of 0.08 opt Au	AF (McPhee 1989)	Patent
Madsen Mine Baird Township (52K/13NW)	Au	Indicated Resource (NI 43-101): 3 236 000 tonnes at 8.93 g/t Au Inferred Resource (NI 43-101): 788 000 tonnes at 11.74 g/t Au	Claude Resources Inc. news release (December 7, 2009)	Patent
May–Spiers Ball Township (52M/01SE)	Au	Reserves: 30 000 tons of 0.09 opt Au	AF (Bayne 1981)	Staked Claim
McCombe (Root Lake) (52J/13NE)	LiO_2	Reserves: 2.3 million tons of 1.3% LiO_2 to the 500 foot level	MP 90 (Breaks 1979)	Patent, Licence of Occupation
McFinley Mine Bateman Township (52N/04SE)	Au	Inferred Mineral Resource: 334 007 *in situ* at an average grade of 0.20 opt Au to a depth of 400 feet; Broken down as follows: FWC-3 zone: 3875 tons of 0.50 opt Au C zone: 10 520 tons of 0.87 opt Au FWC-1 + 2: 30 600 tons of 0.24 opt Au C-2 zone: 128 700 tons of 0.11 opt Au C-3 zone: 36 562 tons of 0.19 opt Au WL zone: 10 500 tons of 0.49 opt Au 403 zone: 5000 tons of 0.80 opt Au BX zone: 2000 tons of 0.84 opt Au D zone: 106 250 tons of 0.15 opt Au Resource Estimate: 890 000 tons at an in-place grade of 0.21 opt Au to a depth of about 1700 feet	AF (Hogg 2002)	Patent, Licence of Occupation
Mount Jamie Todd Township (52M/01SE)	Au	Reserves: Main zone: 47 048 tons of 0.425 opt Au No. 2 Shaft area: 25 360 tons of 0.37 opt Au	AF (Gordon 1988)	Patent
My-Ritt (Coin Lake) (52N/04SW)	Au	Unknown		
New Faulkenham Mines Ltd. (Faulkenham Lake) Baird Township (52K/13NW)	Au	Reserves: 15 000 tons of 0.428 opt Au ($15.00 at $35.00 per ounce Au)	AF (Holbrooke 1958)	Patent
North Spirit Lake (Crown Trust) (53C/07NW)	Fe	Reserves: 1.3 million tons per vertical foot of 33.94% Fe	MRC 11 (Shklanka 1968) GR 150 (Wood 1977)	Patent, Leased
Northgate Prospect Earngey Township (52N/02SE)	Au	Reserves: 64 600 tons of 0.28 opt Au	AF (Zinn 1984)	Staked Claim
Ogani Lake (52K/15NE)	Fe	Reserves: 100 000 000 tons of 21.6% Fe	MRC 11 (Shklanka 1968)	Open

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status
Papaonga Lake (52K/16NE)	Fe	Reserves: 13 500 000 tons of 31.06% Fe	MDIR	Open
Phoenix Project F2 Zone Bateman Township (52N/04SE)	Au	Inferred Resource (NI 43-101): 6 200 000 tonnes of 20.1 g/t Au	Rubicon Minerals Corp., news release, November 29, 2010	Patent, Licence of Occupation
Red Crest (Red Summit) Todd Township (52M/01SE)	Au	Reserves: 47 439 tons of 0.269 opt Au (uncut grade) (Horwood 1945) 38 000 of 0.3 opt Au	NM - March 14, 1985, p.21 ODM Annual Report (Horwood 1945)	Patent
Redaurum Baird Township (52N/04SW)	Au	Possible Reserves: 14A zone: 243 750 tons of 0.22 opt Au, 26 250 tons of 0.20 opt Au No. 2 zone: 137 500 tons of 0.18 opt Au No. 3 zone: 102 500 tons of 0.18 opt Au Camp zone: 24 750 tons of 0.13 pt Au	AF (Barclay 1986)	Patent
Richardson (Kostynuk Bros. Mine) (52N/09SW)	Au	Reserves: 700 000 tons of 0.2 opt Au inferred reserves	OFR 5835 (Parker and Atkinson 1992)	Patent
Rowan Todd Township (52M/01SE)	Au	Reserves: 10 900 tons of 0.657 opt Au ($23.00 a ton at $35.00 per ounce) (Bishop 1939) 798 000 tonnes of 4.7g/t Au (Hy Lake Gold Ltd.)	AF (Bishop 1939) Hy Lake Gold Inc., news release, October 21, 2010	Patent
Sanshaw (Whitehorse Island) Dome Township (52N/04SW)	Au	Reserves: 175 000 tons of 0.20 opt Au	NM - June 11, 1953	Patent, Licence of Occupation
Setting Net Lake (53C/13SE)	MoS_2	Reserves: 100 000 000 tons of 0.09% MoS_2	MDIR NM - March 23, 1973	Open
Sidace Lake Gold Property (Coli Lake) (52N/05SE)	Au	Indicated Resource (NI 43-101): MDZ 1 119 500 tonnes of 3.0 g/t Au, UDZ 247 600 tonnes of 4.19 g/t Au Inferred Resource (NI 43-101): MDZ 1 677 200 tonnes of 3.01 g/t Au, UDZ 425 800 tonnes of 4.11 g/t Au (MDZ = Main Discovery Zone, UDZ = Upper Duck Zone)	Power-Fardy and Breede (2009)	Staked Claims
Sol d'Or Honeywell Township (52N/07SE)	Au	Reserves: 8565 tons of 0.57 opt Au	Energy Mines and Resources Canada 1989	Staked Claim
Springpole Lake Prospect (52N/08NW)	Au	Reserves (NI 43-101): 35 000 t of 6.27 g/t Au measured, 214 000 t of 5.56 g/t Au indicated, 1 353 000 t of 4.53 g/t Au inferred	Armstrong et al. (2006)	Patent, Staked Claims
Starratt–Olsen Mine Baird Township (52K/13NW)	Au	Reserves: 15 000 tons of 0.45 opt Au	NM - July 26, 1973	Patent
Trout Bay Zinc Pit zone Mulcahy Township (52M/01SE)	Zn, Cu, Pb, Ag, Au	Reserves: West zone: 13 776 tons of 4.75% Zn, 0.68% Cu, 0.94 opt Ag East zone: 124 760 tons 7.86% Zn, 1.5% Cu, 0.24% Pb, 1.7 opt Ag, 0.007 opt Au	MP 147 (Atkinson, Parker and Storey 1990) Preliminary Map P.567 (Riley 1969) MDIR	Patent (Mining Rights Only), Leased (Mining Rights Only, Licence of Occupation
Uchi Mine Earngey Township (52N/02SE)	Au	Reserves: 214 000 tons of 0.147 opt Au	Energy Mines and Resources Canada 1989	Patent

Deposit Name and NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status
Wilmar Mine Dome Township (52N/04SW)	Au	Reserves: Quoted from OFR 5558 unless indicated otherwise: Diorite Dike zone: 140 000 tons of 0.21 opt Au East Breccia zone: 31 500 tons of 0.32 opt Au (Proven) 50 500 tons of 0.25 opt Au (Probable) 1 777 000 tons of 0.24 opt Au (Possible) Carbonate zone: 25 000 tons of 0.17 opt Au (Probable) 7500 tons of 0.15 opt Au (Possible) West Granodiorite zone: 3.15 to 4.5 million tons of 0.076 to 0.131 opt Au (Energy Mines and Resources Canada 1989) Granodiorite zone: 5 700 000 tons of 0.10 to 0.15 opt Au	OFR 5558 (Durocher, Burchell and Andrews 1987) Energy Mines and Resources Canada 1989	Patent
Woco Vein Earngey Township (52N/02SE)	Au	Reserves: 21 263 tons of 0.80 opt Au	AF (Germundson 1995)	Staked Claims
Young, H.G. Mines Ltd. Balmer Township (52N/04SW)	Au	Reserves: 270 000 tons of 0.31 opt Au	OFR 5558 (Durocher, Burchell and Andrews 1987)	Patent

Note: This table contains tonnage and grade estimates referred to as reserves (indicated, possible, probable), which were determined at various times by methods largely unreported. Except where noted, none of these estimates are known to conform to the standards required for National Instrument 43-101 and should be considered inferred mineral resources not reserves.

REGIONAL LAND USE GEOLOGIST ACTIVITIES

Land Use Planning Activities

The northwest Regional Land Use Geologist, based in Thunder Bay, coordinates input into land use planning activities in the Thunder Bay South, Thunder Bay North, and Red Lake–Kenora Resident Geologist districts. H.C. Lockwood, P.Geo., filled this position throughout 2010.

The objectives of the position are to:

- effectively represent mineral-related values in the context of competing interests for land use;
- optimize the land base available for mineral exploration and development; and
- raise awareness within the mineral sector of the implications of legislation and regulations other than the *Mining Act* on their activities.

The competing interests for land use vary from place to place across the province, but most have the potential to restrict the availability of land, access to it, and/or the activities on it. In 2010, the northwest Regional Land Use Geologist dealt with a variety of land use planning issues throughout the Northwest Region.

Crown Lands

The Ministry of Northern Development, Mines and Forestry engages with the Ministry of Natural Resources when Crown land use planning activities have the potential to impact Provincial mineral interests. These activities include Forest Management Planning, energy and other major infrastructure projects, Far North Land Use Planning and Community-based Land Use Planning, and various other initiatives related to Crown land use.

The Forest Management Planning process includes consideration of detailed socio-economic descriptions of minerals industry activity in each forest management unit during development of their respective five-year forest

management plans. Formal comments and mineral values maps were provided for the Lakehead, Kenogami and Lake Nipigon forest management units in 2010. The data provided included past mineral production, known mineral resources, mining land tenure, mining-related hazards, and a discussion of current exploration activity and trends.

The northwest Regional Land Use Geologist handled a number of inquiries from concerned landholders affected by mineral industry activities or mining-related hazards. Inquiries were also received from industry proponents regarding camps, access issues in general, conflicts with other land users, and the decommissioning of forest industry roads and water crossings installed by the forest industry throughout the Northwest Region. These inquiries typically required inter-ministerial consultations and discussion with private parties to develop solutions.

The northwest Regional Land Use Geologist works with staff of the Ministry of Natural Resources and other ministries to ensure that mineral values and mineral industry interests are identified and accommodated early in the planning of energy and infrastructure projects of all types. Infrastructure proponents often require considerable assistance to understand the various mineral industry interests that might be affected by their projects, and how mining land tenure may restrict their development plans. Guidance regarding claimholders' interests, exploration activity, mining activity, mineral potential, and mining-related hazards was provided to the proponents of two wind power projects (Greenwich Lake and Shuniah); one fibre optic proposal that would link remote First Nations throughout the Northwest Region; a proposed major powerline alignment from Nipigon to Pickle Lake (Northwest Transmission Expansion Project); a planned run-of-river hydroelectric project on the Namewaminikan River north of Beardmore; and three four-laning and highway realignment projects being undertaken by the Ministry of Transportation.

Providing geoscience advice in support of the community-based land use planning initiatives of First Nation communities in the Far North remains a priority in the Northwest Region. In 2010, the northwest Regional Land Use Geologist, together with other Resident Geologist Program staff from the Thunder Bay North and Red Lake districts, worked extensively with the Ministry of Natural Resources and the Cat Lake and Slate Falls First Nations, the Pauingassi First Nation, and the Little Grand Rapids First Nation as these communities successfully produced draft land use plans. Mineral values mapping, mineral industry information, discussions of mineral potential and compromise solutions to conflicting land uses were highlights of these discussions. Guidance was also provided with regard to an evolving application for a UNESCO World Heritage site being proposed to overlay the Pikangikum, Little Grand Rapids and Pauingassi land use plans, and the planned transfer of a number of parcels of land to Canada on behalf of the Rainy River and Pays Plat First Nations in fulfillment of land claim agreements.

Other work related to Crown land use in the Northwest Region included reviews of 9 applications for withdrawal of lands from staking under Section 35 of the *Mining Act*. Withdrawals are requested for a variety of reasons, including facilitating highway realignments; land exchanges; park expansions; protecting landfill, powerline, and waterpower sites; and protecting aggregate deposits. Review work by the Regional Land Use Geologist ensures that mineral potential, mineral industry activity, and mining related hazards are identified and considered before decisions are made.

Comments and guidance were also provided for 3 aggregate-extraction proposals and 1 Environmental Assessment Review for a municipal landfill site (Pickle Lake).

The northwest Regional Land Use Geologist, together with other staff from the Resident Geologist Program and the Mines Group, developed and delivered a "Mining Lands 101" training session for staff in each Ministry of Natural Resources district office in northwestern Ontario. The training consisted of an overview of the mineral development cycle from staking through exploration and mining to reclamation. The sessions consisted of a four-hour classroom session followed by a field trip to an exploration site to familiarize staff with typical mining industry land impacts. Similar sessions using a subset of the presentation material were also delivered to a Local Citizens Committee (Geraldton–Beardmore–Jellicoe) and, with no field trip component, to the Red Sky Métis Independent Nation.

The northwest Regional Land Use Geologist, together with other staff from the Resident Geologist Program, also provided initial comments, mapping, mineral-related land use statistics, and ongoing discussion regarding the proposed Caribou Habitat regulations being developed by the Ministry of Natural Resources in accordance with the *Endangered Species Act*. Regulations are now expected in mid-2011; it is anticipated that these may have a significant impact on the exploration industry in northwestern Ontario.

Municipal/Private Lands

The Ministry of Northern Development, Mines and Forestry supports municipal and private land use planning through the One Window Planning Service led by the Ministry of Municipal Affairs and Housing. When requested, the northwest Regional Land Use Geologist provides input into, and reviews draft Official Plans, Official Plan Amendments, draft plans of subdivision and consent (severance) applications to ensure that Provincial mineral interests are appropriately considered in the planning process. In 2010, reviews, comments, mineral values mapping and other input as required were provided for draft Official Plans and Official Plan Amendments for the municipalities of Kenora, Sioux Lookout, Sioux Narrows–Nestor Falls, Schreiber, Shuniah, Conmee, and Red Lake. In addition, preconsultations and reviews were provided in conjunction with 23 subdivision and consent applications and 1 validation order.

The northwest Regional Land Use Geologist also assisted Ministry of Municipal Affairs and Housing at its public consultation sessions in Thunder Bay and Dryden regarding the planned revision of the Provincial Policy Statement.

Other Activities

The northwest Regional Land Use Geologist served on working groups dealing with modernization of the *Mining Act* (Aboriginal Initiatives Working Group) and the development of the Northern Ontario Growth Plan.

MINERAL DEPOSIT COMPILATION GEOLOGIST – NORTHWEST ACTIVITIES

The Mineral Deposit Inventory database is a dynamic compilation of over 20 000 records describing most of the known mineral occurrences in the province of Ontario. When used in conjunction with other spatial data bases generated by the Ontario Geological Survey, it enhances the knowledge base required by prospectors and exploration companies to search for new mineral discoveries in Ontario. Mineral Deposit Inventory (MDI) entries also assist in providing guidance with regards to land use planning initiatives.

The Mineral Deposit Compilation Geologist – Northwest assists with the investigation and documentation of mineral deposits and occurrences in northwestern Ontario. Through field visits, comprehensive literature research and personal research, they work with regional and district staff to ensure that the mineral deposit inventory database is regularly updated. Regular updates are required to ensure that the Ministry of Northern Development, Mines and Forestry is using the most up to date information in making land-use planning and policy decisions. N.A. Bennett is currently the Mineral Deposit Compilation Geologist for northwestern Ontario and J. Bongfeldt has been assisting the Kenora District office with updating MDI entries in that region.

In 2010, the northwestern compilation geologist: provides training in the use of the MDI methodology and database entry techniques to regional and district geological staff; updated the MDI data entry and compilation manuals; co-authored Open File Report 6256 *Mineral Occurrences of the Central North Caribou Terrane* with M. Puumala; and worked with a committee that co-ordinated the release of an updated MDI database (provided on CD) at the December Mines and Minerals symposium. In January 2011, the MDI database on GeologyOntario (www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=mdi) also was updated, the first update since 2004.

The total contributions to the MDI database in the northwest for 2010 included 257 updated records, 1 record deleted and 107 new records.

REFERENCES

Archibald, C.W. 1970. Summary report on Copper-Lode Mines Ltd., Red Lake–Uchi Lake area; Red Lake Resident Geologist's office, assessment file, Belanger Township, Copper-Lode Mines Ltd., File #2, 27p.

Armstrong, T., Puritch, E. and Yassa, A. 2006. Technical report and resource estimate on the Springpole Lake gold property, Red Lake Mining Division; NI 43-101 Technical Report, P & E Mining Consultants, filed November 28, 2006 with SEDAR®, *see* SEDAR® Home Page, 94p.

Atkinson, B.T. 1999. Precambrian geology, Medicine Stone Lake area; Ontario Geological Survey, Preliminary Map P.3397, scale 1:50 000.

Atkinson, B.T., Parker, J.R. and Storey, C.C. 1990. Red Lake Resident Geologist's District—1989; *in* Report of Activities 1989, Resident Geologists, Ontario Geological Survey, Miscellaneous Paper 147, p.41-68.

——— 1991. Red Lake Resident Geologist's District—1990; *in* Report of Activities 1990, Resident Geologists, Ontario Geological Survey, Miscellaneous Paper 152, p.31-66.

Ayres, L.D. 1970. Setting Net Lake area; Ontario Department of Mines, Preliminary Map P.538 (Revised), scale 1:15 840.

Ayres, L.D., Raudsepp, M., Averill, S.A. and Edwards, G.R. 1973. Favourable Lake–Berens Lake, geological compilation series, District of Kenora; Ontario Geological Survey, Map 2262, scale 1:253 440.

Barclay, W.F. 1986. Proposed drilling on the Redaurum property, Baird Township, Red Lake, Ontario; Red Lake Resident Geologist's office, assessment file, Baird Township, Redaurum Red Lake Mines Ltd., No. OM85-1-C-219, 9p.

Barron, K.M. 1996. The petrological and metallogenic significance of the alkaline igneous centre at the Springpole gold prospect, northwestern Ontario; unpublished PhD thesis, University of Western Ontario, London, Ontario, 272p.

Bayne, A.S. 1981. Report to Dumont Nickel Corporation on gold property—Ball Township, Red Lake Mining Division; Red Lake Resident Geologist's office, assessment file, Ball Township, Dumont Nickel Corporation, included with No. MEAP RL-86, 25p.

Bevan, A.A. 1983. Getty–Zahavy Joint Venture Favourable Lake project, northwestern Ontario; Red Lake Resident Geologist's office, assessment file, 53C/13SE, Getty Canadian Minerals Ltd., No. OM-82-1-C-54 File# 8, 26p.

Bishop, E.G. 1939. Lake Rowan Gold Mines property; Red Lake Resident Geologist's office, assessment file, Todd Township, Lake Rowan Gold Mines Ltd., 6p.

Blackburn, C.E., Hinz, P., Storey, C.C., Kosloski, L. and Ravnaas, C.B. 1999. Red Lake Resident Geologist's District–1998; *in* Report of Activities 1998, Resident Geologist Program, Ontario Geological Survey, Open File Report 5987, p.1-49.

Breaks, F.W. 1979. Lithophile mineralization in northwestern Ontario, rare element granitoid pegmatites; *in* Summary of Field Work, 1979, Ontario Geological Survey, Miscellaneous Paper 90, p.5-7.

Breaks, F.W., Bond, W.D., Desnoyers, D.W., Stone, D. and Harris, N. 1976. Operation Kenora–Ear Falls, Bruce–Bluffy lakes sheet, District of Kenora; Ontario Division of Mines, Preliminary Map P.1199, scale 1:63 360.

Breaks, F.W., Selway, J.B. and Tindle, A.G. 2001. Fertile peraluminous granites and related rare element pegmatite mineralization, Superior Province, northwest and northeast Ontario; *in* Summary of Field Work and Other Activities 2001, Ontario Geological Survey, Open File Report 6070, p.39-1 to 39-39.

Breaks, F.W., Selway, J.B. and Tindle, A.G. 2003. Fertile peraluminous granites and related rare-element mineralization in pegmatites, Superior Province, northwest and northeast Ontario: Operation Treasure Hunt; Ontario Geological Survey, Open File Report 6099, 179p.

Busch, D.J. 2005. Diamond Drilling 2005, St. Paul's Bay Area, McKenzie Project; Red Lake Resident Geologist's Office, assessment file, Dome Township, Cypress Development Corp., AFRO#2.30124, Red Lake File #RL0987.

Castor, S.B. and Hedrick, J.B. 2006. Rare earth elements; *in* Industrial Minerals and Rocks, 7th ed, Society for Mining, Metallurgy and Exploration Inc., p.769-792.

Carter, G.S. 2007. Technical Report on the Resources at Garnet Lake Property Confederation Lake Belt Red Lake, Ontario on behalf of Tribute Minerals Inc.; Red Lake Resident Geologist's office, assessment file, Belanger Township, Tribute Minerals Inc., Non-Assessment, 37p.

Corfu, F. and Andrews, A.J. 1987. Geochronological constraints on the timing of magmatism, deformation and gold mineralization in the Red Lake greenstone belt, northwestern Ontario; Canadian Journal of Earth Sciences, v.24, p.1302-1320.

Dubé, B., Balmer, W., Sanborn-Barrie, M., Skulski, T. and Parker, J. 2000. A preliminary report on amphibolite-facies, disseminated-replacement-style mineralization at the Madsen gold mine, Red Lake, Ontario; *in* Current Research 2000-C17, Geological Survey of Canada, 12p.

Durocher, M.E., Burchell, P. and Andrews, A.J. 1987. Gold occurrences, prospects, and deposits of the Red Lake area; Ontario Geological Survey, Open File Report 5558, Volume 1, 433p.

Dyer, R.D. and Hamilton, S.M. 2007. Red Lake area high-density regional lake sediment and water geochemical survey, northwestern Ontario; Ontario Geological Survey, Open File Report 6198, 115p.

Energy, Mines and Resources Canada 1989. Canadian mineral deposits not being mined in 1989; Energy, Mines and Resources Canada, Mineral Bulletin 223.

Ferguson, S.A. 1968. Geology of northern part of Heyson Township; Ontario Department of Mines, Geological Report 56, 54p.

Fyon, J.A. 2010. The Ontario Geological Survey Branch; *in* Summary of Field Work and Other Activities 2009, Ontario Geological Survey, Open File Report 6260, p1-1 to 1-9.

Germundson, R.K. 1995. Diamond drill report, St. Jude Resources Ltd.; Red Lake Resident Geologist's office, assessment file, Earngey Township, St. Jude Resources Ltd., No. OM94-080, 107p.

Gillies, B. 1982. Thrall property, Red Lake District: report on 1981 surface diamond drilling program for Camflo Mines Ltd.; Red Lake Resident Geologist's office, assessment file, Dome Township, Camflo Mines Ltd., AFRO# 63.4032, 27p.

Gordon, J.B. 1988. Jamie Frontier Resources Inc. summary report on the exploration program in Todd Township, Red Lake, Ontario, March 1987 to February 1988; Red Lake Resident Geologist's office, assessment file, 52M/01SE, Todd Township, Jamie Frontier Resources Inc., OM87-1-L-154, 25p.

Harron, G.A. and Puritch, E. 2010. Technical Report on North Madsen Properties Dome And Heyson Townships Red Lake M.D. Ontario, Canada For Mega Precious Metals Inc.; Technical Report, filed July 23, 2010 with SEDAR®, *see* SEDAR® Home Page, 85p.

Hogg, G.M. 2002. Technical report on the McFinley Mine property of Rubicon Minerals Corporation; Red Lake Resident Geologist's office, assessment file, Bateman Township, Rubicon Minerals Corporation, Non-Assessment, 25p.

Holbrooke, G.L. 1958. Report on Red Lake properties, New Faulkenham Mines Ltd.; Red Lake Resident Geologist's office, assessment file, Baird Township, New Faulkenham Mines Ltd., 4p.

Horwood, H.C. 1945. Geology and mineral deposits of the Red Lake area; Ontario Department of Mines, Annual Report 1940, v.49, pt.2, 231p.

Jensen, L.S. 1976. A new cation plot for classifying subalkalic volcanic rocks; Ontario Division of Mines, Miscellaneous Paper 66, 22p.

Irvine, T.N. and Baragar, W.R.A. 1971. A guide to the chemical classification of the common volcanic rocks; Canadian Journal of Earth Sciences, v.8, p.523-548.

King, D. and Petrie, L. 1998. Report on geophysical surveys (MAG, HLEM 1996), the Dixie property; Red Lake Resident Geologist's office, assessment file, 52K/14 NW, Noranda Mining and Exploration Inc., AFRO# 2.18690, 16p.

Kita, J. 1988. OMEP Report of work done on the Buffalo property by Red Lake Buffalo Resources Ltd., September 1 to December 31, 1987 and March 1 to May 31, 1988; Red Lake Resident Geologist's office, assessment file, Heyson Township, Red Lake Buffalo Resources Ltd., No. OM87-1-L-190, 64p.

Kuryliw, C.J. 1967. A geological report on Aiken–Russet Red Lake Mines Ltd.; Red Lake Resident Geologist's office, assessment file, Baird Township, Aiken–Russet Red Lake Mines Ltd., No. MEAP RL-27, 16p.

Lewis, P. 1994. Geological survey, Big Falls property, November 1994; Red Lake Resident Geologist's office, assessment file, 52K/NW/14, Cumberland Resources Ltd., AFRO# 2.16247, 26p.

Lichtblau, A., Ravnaas, C., Storey, C.C., Raoul, A., Kosloski, L. and Wilson, S. 2003. Report of Activities 2002, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 6110, 112p.

Lichtblau, A.F., Ravnaas, C., Storey, C.C., Hinz, P. and Bongfeldt, J. 2008. Report of Activities 2007, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 6216, 89p.

Lichtblau, A.F., Ravnaas, C., Storey, C.C., Lockwood, H.C., Bongfeldt, J. and McDonald, S. 2010. Report of Activities 2009, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 6244, 77p.

MacDougall, C. 1995. Report on geophysical surveys (MAG, HLEM)–1994 Ben Lake project 1994; Red Lake Resident Geologist's office, assessment file, 52K/NW, Noranda Mining and Exploration Inc., AFRO# 2.15981, 12p.

——— 1996. Report on diamond drilling and lithogeochemistry 1994–1995, Copperlode property; Red Lake Resident Geologist's office, assessment file, Belanger Township, Noranda Mining and Exploration Inc. (Copperlode Property), AFRO# 2.17097, 24p.

McClean, P. 1976. The 1976 exploration program Abino Gold Mines Ltd.; Red Lake Resident Geologist's office, assessment file, Dome Township, Abino Gold Mines Ltd., No. MEAP RL-46, 19p.

McPhee, D.S. 1989. The Lingman Lake deposit, Red Lake Mining Division: report for Twin Gold Mines Ltd.; Red Lake Resident Geologist's office, assessment file, 53F/15 SW, Twin Gold Mines Ltd., No. OM88-1-l-217, 27p.

Ontario Geological Survey 2000. Bedrock geology, seamless coverage of the province of Ontario; Ontario Geological Survey, Data Set 6.

Parker, J.R. and Atkinson, B.T. 1992. Gold occurrences, prospects and past-producing mines of the Birch–Confederation lakes area; Ontario Geological Survey, Open File Report 5835, 332p.

Pirie, J. and Sawitzky, E. 1977. McDonough Township, District of Kenora (Patricia Portion); Ontario Geological Survey, Preliminary Map P.1240, scale 1:12 000.

Power-Fardy, D. and Breede, K. 2009. Technical Review of the Sidace Lake Gold Property, including mineral resource estimates for the Main Discovery and Upper Duck zones, Red Lake Mining Division, Northwestern Ontario for Planet Exploration Inc.; Technical Report, filed April 14, 2009 with SEDAR®, *see* SEDAR® Home Page, 118p.

Pressacco, R. 2004. Technical report on the resource estimate of the gold mineralization found on the Western Discovery zone of the Gold Eagle Mine property, Red Lake Ontario; Technical Report, filed January 5, 2005 with SEDAR®, *see* SEDAR® Home Page, 70p.

Puumala, M.A. and Bennett, N.A. 2011. Mineral occurrences of the central North Caribou terrane; Ontario Geological Survey, Open File Report 6256, 203p.

Richardson, D.G. and Birkett, T.C. 1996. Peralkaline rock associated rare metals; *in* Geology of Canadian Mineral Deposit Types, Geology of Canada, No. 8, p.523-540.

Riley, R.A. 1969. Mulcahy Township, District of Kenora, Patricia Portion; Ontario Department of Mines, Preliminary Map P.567, scale 1:9600.

Robertson, J.A. and Gould, K.L. 1983. Uranium and thorium deposits of northern Ontario; Ontario Geological Survey, Mineral Deposits Circular 25, 152p.

Sage, R.P. 1987. Geology of carbonatite – alkalic complexes in Ontario: "Carb" Lake Carbonatite Complex, District of Kenora; Ontario Geological Survey, Study 53.

Sanborn-Barrie, M., Rogers, N., Skulski, T., Parker, J., McNicoll, V. and Devaney, J. 2004. Geology and tectonic assemblages, Red Lake and Birch–Uchi belts, Ontario; Geological Survey of Canada, Open File 4256; Ontario Geological Survey, Preliminary Map P.3460, scale 1:250 000.

Sanborn-Barrie, M., Skulski, T. and Parker, J. 2001. Three hundred million years of tectonic history recorded by the Red Lake greenstone belt, Ontario; *in* Current Research 2001-C19, Geological Survey of Canada, 32p.

Sanborn-Barrie, M., Skulski, T. and Parker, J. 2004. Geology, Red Lake greenstone belt, western Superior Province Ontario; Geological Survey of Canada, Open File 4594, scale 1:50 000.

Sanborn-Barrie, M., Stott, G. and Western Superior NATMAP Team. 2005. Evolution of the Archean western Superior Province and its mineral deposits through time; presentation at the Ontario Exploration and Geoscience Symposium, Sudbury, December 13 and 14, 2005.

Shklanka, R. 1968. Iron deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular 11, 217p.

——— 1969. Copper, nickel, lead and zinc deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular 12, 394p.

——— 1970. Geology of the Bruce Lake area, District of Kenora; Ontario Department of Mines, Geological Report 82, 27p.

Stone, D. 1998. Chemical analyses of minerals and rocks of the Berens River area; Ontario Geological Survey, Miscellaneous Release–Data 32.

——— 2005. Geology of the Northern Superior area, Ontario; Ontario Geological Survey, Open File Report 6140, 94p.

Stone, D., Crawford, J. and Halstead, J. 1993. Precambrian geology, Kember Lake area; Ontario Geological Survey, Preliminary Map P.3220, scale 1:50 000.

Stone, D., Fogal, R. and Fitzsimon, S. 1993. Precambrian geology, Favourable Lake area; Ontario Geological Survey, Preliminary Map P.3226, scale 1:50 000.

Storey, C.C., Hinz, P., Gosselin, S.D.M., Blackburn, C.C. and Kosloski, L. 2000. Report of Activities 1999, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 6003, 66p.

Stott, G.M., Corkery, T.M., Percival, J.A., Simard, M. and Goutier, J. 2010. A revised terrane subdivision of the Superior Province; *in* Summary of Field Work and Other Activities 2010, Ontario Geological Survey, Open File Report 6260, p.20-1 to 20-8.

Tindle, A.G., Selway, J.B. and Breaks, F.W. 2002. Electron microprobe and bulk analyses of fertile peraluminous granites and related rare-element pegmatites, Superior Province, northwest and northeast Ontario: Operation Treasure Hunt; Ontario Geological Survey, Miscellaneous Release–Data 111.

Tilsley, J.E. 1981. Evaluation of the Fairlie prospect Project No. 1259 for Sherritt Gordon Mines Ltd.; Red Lake Resident Geologist's office, assessment file, Fairlie Township, Sherritt Gordon Mines Ltd., AFRO# 2.4561, 58p.

Wilton, C.K. 1973. Magnetometer and electromagnetic survey and diamond drilling on the property of Cole Gold Mines Ltd. and adjoining Kerr Addison claims, Ball Township, Ontario; Red Lake Resident Geologist's office, assessment file, Ball Township, Cole Gold Mines–Kerr Addison (option), No. MEAP RL-19, AFRO# 63.3206, 6p.

Wood, J. 1977. Geology of North Spirit Lake area, District of Kenora (Patricia Portion); Ontario Division of Mines, Geoscience Report 150, 60p.

Zinn, R.A. 1984. Report of exploration in 1983, Earngey Township, Project 430, Orofino Resources Ltd.; Red Lake Resident Geologist's office, assessment file, Earngey Township, Orofino Resources Ltd., AFRO# 2.7823, 14p.

Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Red Lake Regional Resident Geologist (Kenora District)—2010

by

C. Ravnaas and J. Bongfeldt

2011

CONTENTS

Kenora District—2010

INTRODUCTION 1
MINING ACTIVITY 1
Nelson Granite Ltd. 1
EXPLORATION ACTIVITY 6
Gold 6
Copper and Gold 14
Orthomagmatic Base Metals and Platinum Group Elements 14
Rare Metals 14
Volcanogenic Massive Sulphides 14
KENORA DISTRICT STAFF AND ACTIVITIES 20
PROPERTY EXAMINATIONS 23
Rare Earth Element Potential of Scarp Lake Property 23
RECOMMENDATIONS FOR EXPLORATION 25
Platinum Group Element, Nickel and Copper Prospective Areas in the Kenora District 25
OGS ACTIVITIES AND RESEARCH BY OTHERS 29
REGIONAL LAND USE GEOLOGIST ACTIVITIES 35
MINERAL DEPOSIT COMPILATION GEOLOGIST – NORTHWEST ACTIVITIES 35
ACKNOWLEDGMENTS 35
REFERENCES 36

Tables

1. Assessment files received in the Kenora District in 2010 2
2. Mineral resource estimate for Cameron Lake Deposit 6
3. Summary of areas tested by diamond drill programs on the Cameron Lake property in 2010 7
4. Mineral resource estimate for the East Cedartree Extension gold deposit 7
5. Anomalous gold mineralization from diamond drill program completed on the Sherridon property in 2010 10
6. Historical mineral resource estimate of the Richardson Township gold zones 11
7. Revised mineral resource estimate of the Richardson Township gold zones 11
8. Diamond drill holes used in mineral resource estimate 13
9. Mineral resource estimate of the Thunder Lake gold deposit 13
10. Exploration activity conducted in the Kenora District in 2010 15
11. Property and field examinations conducted by the Kenora District Geologist in 2010 21
12. Average REE assay values of samples collected from unaltered and altered areas of the Scarp Lake occurrence 25
13. PGE-nickel-copper prospective areas in the Kenora District 26
14. Mineral deposits not being mined in the Kenora District in 2010 31

Figures

1. Extent of staking in the Kenora District in 2010 5
2. Location of Kenwest and Canamerica gold properties in the Upper Manitou Lake area 9
3. Exploration and quarry activity in the Kenora District in 2010 19
4. Property visits and field examinations conducted in the Kenora District in 2010 22
5. Lake sediment sample sites in Higbee Lake felsic intrusion 23
6. Location of sample sites at the Scarp Lake occurrence 24
7. Areas of PGE-nickel-copper potential in the Kenora District 28
8. Location of OGS activities conducted in the Kenora District in 2010 29
9. Location of mineral deposits not being mined in the Kenora District 30

RED LAKE REGIONAL RESIDENT GEOLOGIST (KENORA DISTRICT)—2010

C. Ravnaas[1] and J. Bongfeldt[2]

[1]District Geologist, Kenora District, Resident Geologist Program, Ontario Geological Survey

[2]District Geological Assistant, Kenora District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

The Kenora District extends from the Manitoba border, east to Savant Lake and south to the International Border. It encompasses the towns of Kenora, Vermilion Bay, Dryden, Ignace, Sioux Lookout, Savant Lake and Fort Frances, and a number of First Nation communities of Treaty 3 affiliation.

Dimension stone continued to be produced in the Kenora District in 2010. No metallic mineral production was recorded in the District. With the continued rise in commodity prices and positive results from exploration efforts in 2009, companies and prospectors stepped up their work in 2010. The majority of exploration activity in the Kenora District targeted gold mineralization. Significant exploration projects targeted gold at the Goliath property (Treasury Metals Inc.), Mine Centre property (Q-Gold Resources Ltd.), St Anthony project (Pacific Iron Ore Corporation), Richardson Township property (Rainy River Resources Ltd.), and at the West Cedartree properties (Houston Lake Mining Inc.).

In 2010, significant gold exploration programs were initiated on the Burns Block property (Bayfield Ventures Corp.), Cameron Lake property (Coventry Resources Limited), Canamerica and Big Master properties (Manitou Gold Inc.), Olympian property (Nuinsco Resources Limited), Sherridon property (Manitou Gold Inc.), and Shoal Lake West – Duport property (Everton Resources Inc.).

Iron potential continues to be targeted at the Bending Lake property (Bending Lake Iron Group Ltd.) and at the Mine Centre property (Numax Resources Inc.).

Orthomagmatic base metals and platinum group elements were targeted at the Werner Lake Mineral Belt property (Puget Ventures Inc.). Base and precious metals continued to be targeted at the Atikwa Lake–Maybrun property (Opawica Explorations Inc.).

In 2010, volcanogenic massive sulphide projects were initiated at the Claw Lake property (Xstrata Canada Corporation) and at the Sturgeon Lake property (Excalibur Resources Ltd.).

A total of 58 exploration projects were conducted by mineral exploration companies and individual prospectors during the year (Table 10). Work completed within the Kenora District and filed for assessment credit, or otherwise provided, is shown in Table 1.

MINING ACTIVITY

There was no production of either base or precious metals in the Kenora District in 2010. Production continued from 4 granite quarries in 2010. The quarries are keyed, with letters, to Figure 3.

Nelson Granite Ltd.

Nelson Granite Ltd. continued year-round production from 4 historical stone quarries and initiated extraction from one new quarry in the Kenora District during 2010.

Production continued at the **Docker Township quarry** (A), 10 km southwest of the town of Vermilion Bay. Homogeneous, medium-grained, pink granite is produced from a granite plug, which is part of the Dryberry batholith. The majority of the stone produced is used in the monument industry and is sold as "Vermilion Pink". In 2010, approximately 5543.6 m^3 (195 768 ft^3) were produced (C. Spence, Nelson Granite Ltd., personal communication, 2011).

The company continued to produce stone from their **Forgotten Lake quarry** (B) and **Second Mountain quarry** (C). The quarries are located on the eastern side of Forgotten Lake, approximately 35 km north of Kenora and 10 km north of the hamlet of Redditt. A total of 3132 m^3 (110 590 ft^3) were produced for use as monument and building stone from these quarries in 2010. The "Pine Green" stone from the Forgotten Lake quarry is green, feldspar-megacrystic granite and the stone from the Second Mountain quarry is a feldspar-megacrystic granite, sold as "Crystal Gold" (C. Spence, Nelson Granite Ltd., personal communication, 2011).

Production continued at the **Red Deer Lake quarry** (D) in 2010. The quarry is located near Red Deer Lake, approximately 40 km northeast of Kenora and 15 km northwest of the railway stop at Jones. A total of 2079.3 m^3 (73 429 ft^3) were produced for use as monument and building stone. The stone is marketed as "Red Deer Brown" or "Canadian Mahogany" (C. Spence, Nelson Granite Ltd., personal communication, 2011).

Nelson Granite Ltd. initiated production from the **Redditt quarry** (E) in 2010. The quarry is located approximately 2 km northwest of the hamlet of Redditt and situated on the north side of Corn Lake. A total of 673.3 m^3 (23 779 ft^3) were produced for use as monument and building stone. The stone is marketed as "Winter Birch" (C. Spence, Nelson Granite Ltd., personal communication, 2011).

Table 1. Assessment files received in the Kenora District in 2010.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
BS ..... Beneficiation Study
Bulk ..... Bulk sample
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DDR ..... Diamond drill hole re-logging
DDU ..... Diamond drill hole underground
EM ..... Electromagnetic survey
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GR ..... Geological report
Gs ..... Gravity survey
IP ..... Induced polarization survey
Lc ..... Linecutting
MRE ..... Mineral Resource Estimate
OVD ..... Overburden drill hole(s)
P ..... Prospecting
Res ..... Resistivity survey
SA ..... Sampling (other than bulk)
Str ..... Overburden removal and excavation
Tr ..... Trenching

Township or Area	Company Name	Year	Type of Work (Work Value)	AFRO Number	Resident Geologist Office File Designation	
Atikwa Lake Area	Maybrun Mines Ltd.	1955-1976	DDH, P, SA, GL	donated	52F05NE	P-6
Bad Vermilion Lake Area	Q-Gold Resources Ltd.	2009	DDH, SA ($149 419)	2.43890	52C10NE	LLL-12
Beckington Lake Area	Sturgex Mines Ltd.	1970-1972	GL, GEM	donated	52J02NE	82
Bell Lake Area	Xstrata Canada Corporation	2010	P, SA ($13 704)	2.46019	52G15SW	56
Bennett Township	Gitchee Gumee Gold	1991-1992	DDH, SA, GM, Tr ($3 499)	donated	52C16SE	G-1
Bliss Lake Area	Numax Resources Inc.	2010	GM, EM, DDH, SA, Str ($84 293)	2.43316	52C10NW	Z-11

Township or Area	Company Name	Year	Type of Work (Work Value)	AFRO Number	Resident Geologist Office File Designation	
Bliss Lake Area	Numax Resources Inc.	2010	GC, SA ($239 900)	2.43798	52C10NW	Z-12
Bliss Lake Area	Numax Resources Inc.	2008	Str, DDH, P ($24 452)	2.44177	52C10NW	Z-13
Bluffpoint Lake Area	Ryznar, T.	2008-2010	Str, GL, P ($5 545)	2.43720	52F03NW	Z-3
Boyer Lake Area	Glatz, A.	2008-2009	P, SA ($10 329)	2.43068	52F07NE	GGG-2
Boyer Lake Area	Glatz, A.	2008-2010	GC, P ($4 936)	2.46055	52F07NE	OOO-2
Code Township	Nuinsco Resources Limited	2010	GEM, IP ($15 926)	2.45815	52E09SE	HH-1
Code Township	Pacific Iron Ore Corporation	2008	P, SA, GL ($10 111)	2.43841	52E09SE	M-1
Colenso Township	Scott, R. & Simpson, W.	2009	P, Lc, Str ($7 938)	2.42213	52F14NW	G-1
Colenso Township	Scott, R. & Simpson, W.	2009-2010	P ($10 291)	2.45043	52F14NW	G-2
Dogpaw Lake Area	Metals Creek Resources Corp.	2009	P, SA, GL ($18 510)	2.42886	52F05SW	QQQQ-3
Drope Township	Algoma Steel Corporation Ltd.	1969	P, SA, GL	donated	52F15NE	37
Dunne Lake Area	Algoma Steel Corporation Ltd.	1971-1972	GEM, GM, P	donated	52G15SW	55
Dunne Lake Area	NEBU Resources Inc.	2009	AM ($50 939)	2.42631	52G15SE	31
Eagle Rock Lake Area	Champion Bear Resources Ltd.	2009	P, SA, GR ($24 958)	2.43165	52F02NE	D-13
Eagle Rock Lake Area	Champion Bear Resources Ltd.	2009	DDH, SA ($325 326)	2.43679	52F02NE	D-14
Echo Township	Tamaka Gold Corporation	2008	DDH, SA ($79 447)	2.42751	52F16NW	131
Farrington Township	Numax Resources Inc.	2009	GC, P, SA ($4 393)	2.44256	52C10NW	Z-14
Fisher Lake Area	Whetstone Minerals Inc.	2009	P, SA ($34 105)	2.43634	52F12SE	F-2
Fourbay Lake Area	Aur Lake Exploration Inc.	2008-2009	P, SA ($8 382)	2.43394	52J02SW	113
Garnet Bay Area	Manitou Gold Inc.	2009	P, SA, GL ($19 988)	2.44751	52F11NW	B-1
Garnet Bay Area	Pacific Iron Ore Corporation	2009	P, SA ($2 031)	2.42967	52F11NW	A-2
Indian Bay Area	International Millennium Mining Corp.	2007-2009	GC, P ($167 928)	2.42638	52E11NE	CC-1
Laval Township	Crystal Quartz Canada Inc.	2010	P, SA, GL ($2 195)	2.45870	52F16SW	J-1
Lobstick Bay Area	International Millennium Mining Corp.	2009	GC, SA ($36 017)	2.42784	52F05NW	EE-2
Mang Lake Area	Angove, R.	2010	P ($2 890)	2.46122	52F02SW	D-3
McIlraith Township	Magna Resources Ltd.	2009	Str, Tr, SA ($8 248)	2.43530	52K01SW	44
Melgund Township	Wetelainen, H.	2010	GL, Lc, SA ($25 186)	2.45407	52F09SW	UU-1

Township or Area	Company Name	Year	Type of Work (Work Value)	AFRO Number	Resident Geologist Office File Designation	
Osbourne Bay Area	Abitibi Mining Corp.	2010	Tr, Str, GR, P, SA ($26 758)	2.44231	52F11SE	F-1
Patterson Lake Area	Gossan Resources Limited	2009	P, SA, GC ($52 619)	2.42947	52L07SE	U-2
Patterson Lake Area	Pacific Iron Ore Corporation	2009	GL ($56 548)	2.43263	52L07SE	W-2
Penassi Lake Area	Unitronix Corporation	2008-2009	P, SA, Str ($4 355)	2.43410	52G14NE	70
Raleigh Lake Area	Consolidated Abaddon Resources Inc.	2010	GM, DDH ($277 845)	2.44975	52G05NW	P-1
Revell Township	Bond, J.	1997	GL	donated	52F09SE	U-1
Reynar Lake Area	Puget Ventures Inc.	2009	DDH, SA ($84 768)	2.43197	52L06NE	BB-1
Rickaby Lake Area	Selco Mining Corporation Ltd.	1972-1974	GM, AEM, EM	donated	52L11NE	I-12
Rowan Lake Area	Charger Resources Ltd.	1983	GC, SA, GM, Res, IP	donated	52F05SE	OO-4
Rowan Lake Area	Norris, M.	2008-2009	P, SA ($16 907)	2.42660	52F05SE	AA-5
Satterly Township	Gold Summit Corporation	2008	Str, Tr, DDH, SA ($83 065)	2.42594	52F09SW	U-1
Senn Township	Rainy River Resources Ltd.	2010	DDH, SA ($200 968)	2.45081	52C13NW	Q-10
Shoal Lake Area	Everton Resources Inc.	2010	GM ($13 736)	2.44372	52E10SW	H-1
Shoal Lake Area	Everton Resources Inc.	2010	AM ($39 878)	2.44884	52E10SW	Z-1
Sixmile Lake Area	Mattagami Lake Expl Ltd.	1977	GL	donated	52G15NW	112
Snowshoe Bay Area	Everton Resources Inc.	2010	DDH ($1 476 334)	2.44368	52E11SE	F-1
Snowshoe Bay Area	Everton Resources Inc.	2009-2010	DDH, SA ($66 299)	2.44785	52E11SE	F-2
Solitude Lake Area	Hanna Mining Company	1966-1972	DDH, SA, GM, GR	donated	52J10SE	21
Squaw Lake Area	Mistango Consolidated Resources Ltd.	1986	DDH	donated	52J02SE	141
Stop Lake Area	Minor, J.A.	2008	Str, P ($19 760)	2.43288	52L01NW	C-1
Tabor Lake Area	Laurentian Goldfields Ltd	2009	P, SA, GC ($6 880)	2.43125	52F09SW	TT-1
Valora Lake Area	Steep Rock Iron Mines Ltd.	1969-1972	DDH, SA, GL, GM, GC	donated	52G14SE	D-1
Vermillion Township	Glatz, A. & Riives, J.	2010	P, SA, GL ($2 994)	2.45447	52K01SW	45
Werner Lake Area	Puget Ventures Inc.	2009	P ($36 789)	2.43070	52L07NW	T-1
			Total: $3 857 389			

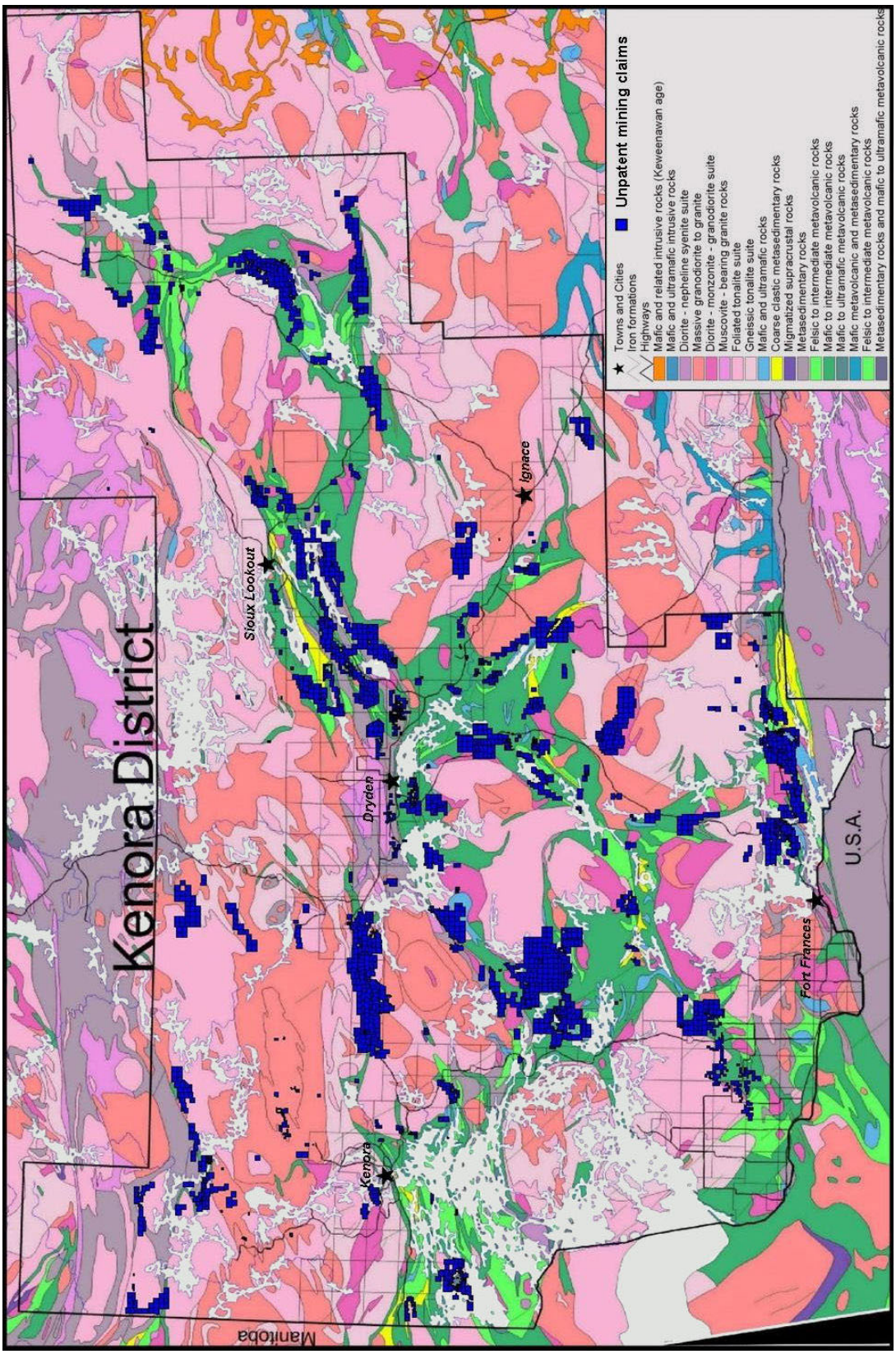


Figure 1. Extent of staking in the Kenora District in 2010 (*modified from* OGS 2003).

EXPLORATION ACTIVITY

A complete summary of exploration activity, including prospecting, is given in Table 10. The extent of staking is shown in Figure 1. Significant exploration programs described below were conducted in the Kenora District in 2010 and are largely based on exploration success from previous years' work. Described below are programs with significant exploration expenditures and/or results. Programs are keyed with numbers to Table 10 and Figure 3.

Gold

Bayfield Ventures Corp. (5) resumed exploration work on the Burns, B and C Blocks properties, in the Rainy River area. These properties are located approximately 55 km northwest of Fort Frances. Geological mapping and an airborne VTEM® electromagnetic system and magnetometer survey were completed over all three properties. In 2010 diamond drill programs were initiated on the Burns and B Block properties. This drill program targeted areas of potential precious metal mineralization that were identified based on the results from the 2008 exploration work.

Fifty-four drill holes totalling 19 311 m were completed on the Burns Block property which is located in Richardson Township and situated adjacent to the eastern boundary of Rainy River Resources Ltd. Richardson Township Project. This drill program targeted mineralization in the North, West and 283 gold zones. Drill hole RR10-18, which tested the 283 zone, intersected 81 m grading 5.08 g/t Au; this included a 10 m interval that returned 35.93 g/t Au (Bayfield Ventures Corp., news release, September 8, 2010). This 10 m mineralized section from hole RR10-18 also returned 359.7 g/t Ag, which included a 1 m interval that graded 1760 g/t Ag (Bayfield Ventures Corp., news release, October 20, 2010). Bayfield Ventures Corp. mentions "silver mineralization at the Burns Block could be very important in an eventual assessment of the economic parameters of the known mineralization. Bayfield has now decided to proceed with silver assays for all gold mineralized zones at the Burns Block" (Bayfield Ventures Corp., news release, October 20, 2010).

At the B Block property 11 diamond drill holes totalling approximately 4473 m were also completed in 2010. The property, located in Richardson Township, is situated approximately 1200 m north of the Burns Block property. Additional work is planned for three other properties.

Coventry Resources Limited (11) completed the acquisition of and initiated an aggressive multi-phase exploration program on the Cameron Lake gold property, located approximately 29 km southeast of the hamlet of Sioux Narrows. These efforts focused on expanding the historical mineral resources at the Cameron Lake gold deposit but also targeted mineralization at numerous gold occurrences on the property. Coventry Resources Limited announced an updated mineral resource estimate on the Cameron Lake gold deposit. This estimate was reported before the initiation of the 2010 exploration program (Table 2).

Table 2. Mineral resource estimate for Cameron Lake Deposit (cut-off grade 1.5 g/t Au) (Coventry Resources Limited, news release, February 10, 2010).

Category	Tonnes	Average Grade (g/t Au)	Ounces Au
Indicated	4 164 000	3.16	422 353
Inferred	1 148 000	2.54	583 480
Total	**11 312 000**	**2.77**	**1 005 833**

Coventry Resources Limited initiated a diamond drill program with a majority of the holes designed to upgrade the mineralization from inferred to indicated resource category and to test the extension of gold-bearing zones at the Cameron Lake Deposit. Several other gold occurrences on the property were also targeted by this diamond drill program (Table 3). Induced polarization surveys, geological mapping and sampling programs were also completed over these areas. The areas presented in Table 3 and several other historical mineral occurrences on the property will be the target of future diamond drill programs.

Table 3. Summary of areas tested by diamond drill programs on the Cameron Lake property in 2010.

Area	Number of Holes	Total Length of Holes (m)
Beggs occurrence	10	1 412
Burke occurrence	6	1 287
Cameron Lake Deposit	90	13 354
Meston occurrence	4	640
Ned occurrence	1	120
Program Totals	**111**	**16 813**

Coventry Resources Limited also completed an airborne magnetometer survey over the Cameron Lake property. A compilation of historical data is planned to continue on the Cameron deposit and other mineralized areas on the property.

Everton Resources Inc. (13) conducted exploration work on the Shoal Lake East property located 40 km southwest of the city of Kenora. This property consists of the Machin and KPM options. An airborne magnetometer geophysical survey was completed over the Machin option on the property. In 2010 Everton Resources Inc. also announced a revised estimate for the historical mineral resources on the East Cedartree Extension gold deposit (Table 4). The database for this estimate comprised 2159 gold assay results from 146 diamond drill holes, totalling approximately 35 414 m (Everton Resources Inc., press release, February 4, 2010).

Table 4. Mineral resource estimate for the East Cedartree Extension gold deposit.

Cut off	Indicated Resource Category			Inferred Resource Category		
(g/t)	Tonnes	Grade (g/t Au)	Ounces Au	Tonnes	Grade (g/t Au)	Ounces Au
1.0	1 000 000	4.18	134 400	3 050 000	3.25	318 700
3.0	430 000	7.56	104 500	1 080 000	5.99	208 100
5.0	252 000	10.07	81 600	480 000	8.80	135 800

Everton Resources Inc. (14) also initiated a diamond drilling program on the Shoal Lake West – Duport property, located 46 km southwest of the city of Kenora. Twenty-eight holes totalling approximately 8271 m were designed to assess mineralization related to the Duport Deformation Zone and the Stevens Island Deformation Zone. The mineral potential of areas associated with conductive and magnetic anomalies, which were identified from an airborne geophysical survey completed on the property in 2005, were also tested with this drill program.

The Duport Deformation Zone, which hosts the prospective Duport gold deposit, was tested over a strike length of 6.1 km during this drill program. The Duport Deposit contains a historical indicated mineral resource of 424 000 tonnes grading 13.40 g/t Au (Everton Resources Inc., news release, July 9, 2009). The drill program succeeded in extending the mineralized zones at the Duport Deposit to a vertical depth of 365 m. Drill hole SLW10-11 intersected 2.14 m grading 16.61 g/t Au and a 1.83 m interval in drill hole SLW10-15 returned 10.74 g/t Au (Everton Resources Inc., news release, April 6, 2010).

The drill program was also successful in intersecting mineralization associated with the Stevens Island Deformation Zone, which is located 750 m to the east and trends parallel to the Duport Deformation Zone. Drill hole SLW10-26 intersected 2.44 m grading 11.72 g/t Au. Based on interpretation of ground VLF-EM conductive responses, the mineralized zone associated with this part of the Stevens Island Deformation Zone could extend for 400 m (Everton Resources Inc., news release, April 6, 2010).

Houston Lake Mining Inc. (19) continued an integrated exploration program on the West Cedartree gold project, which comprises 8 properties, approximately 20 km southeast of Sioux Narrows. Regional and detailed mapping was completed on parts of the project area. A majority of exploration work conducted in 2010 targeted the potential of the gold-bearing zones at the Dubenski and West Cedartree properties.

***Dubenski Property*:** Two phases of diamond drilling were completed on the property in 2010. A 33-hole Phase IV diamond drill program, totalling approximately 4900 m, confirmed that the Dubenski Mineralized Zone, which is associated with the Shaft zone, continues eastward to the Central gold zone. The historical Central gold zone is located 425 m east of the Shaft gold zone (Houston Lake Mining Inc., news release, June 25, 2010). Drill hole DB10-70 intersected 19 m grading 9.99 g/t Au, including a 3.1 m section that returned 57.28 g/t Au (Houston Lake Mining Inc., news release, March 25, 2010).

The 6-hole, 1600 m Phase V diamond drill program was designed to test the down-plunge and down-dip extension of the Dubenski Mineralized Zone. Drill hole DB10-98 intersected 11 m grading 0.824 g/t Au. Down-hole geophysical surveys are planned for the drill holes completed during this Phase V program (Houston Lake Mining Inc., news release, October 20, 2010).

***West Cedartree Property*:** An induced polarization (IP) survey completed in 2008 identified several conductive anomalies in an area located approximately 1600 m south of the Angel Hill gold zone. Mechanical removal of overburden, pressure washing, channel-cutting and sampling were completed in 2010 on several sulphide-bearing exposures that could be associated with the anomalous area identified by the IP survey. A 5.82 m channel-cut interval identified by this program on the Robertson gold zone graded 1.37 g/t Au (Houston Lake Mining Inc., press release, August 23, 2010). In 2010, an 8-hole, 1600 m diamond drill program was designed to target the mineral potential related to the Robertson gold zone. Drill hole WC10-05 intersected 22.6 m grading 2.047 g/t Au, including a 4.3 m section that returned 4.74 g/t Au (Houston Lake Mining Inc., news release, October 20, 2010).

Kings Bay Gold Corporation (23) initiated an exploration program on the Menary gold property located approximately 45 km northwest of Fort Frances. A control grid was established on a portion of the property to cover the historical Wagg, Galbraith A and Galbraith B mineral occurrences. Ground very-low-frequency electromagnetic and magnetometer geophysical surveys, geological mapping and prospecting programs were completed utilizing the grid. A 16-hole, 1500 m diamond drill program, which mainly targeted the Wagg gold occurrence, was completed in 2010. Numerous intervals of anomalous gold mineralization were intersected in a majority of the drill holes. Drill hole MIN-10-10 intersected a 12.1 m interval that returned a weighted average grade of 17.1 g/t Au. Significant assay results from this 12.1 m interval are 1.5 m grading 46.64 g/t Au and a 0.8 m section that returned 57.58 g/t Au (Kings Bay Gold Corporation, news release, December 6, 2010).

Manitou Gold Inc. initiated an aggressive exploration program on the Canamerica (26) and Kenwest (27) gold properties in 2010. The properties, which were acquired in 2009, are situated near the northeast portion of Upper Manitou Lake and are located approximately 40 km south of the city of Dryden (Figure 3). A control grid was established along a five-kilometre corridor and was designed to cover a majority of the historical mineral occurrences on the properties. Induced polarization and magnetometer geophysical surveys, geological mapping and prospecting programs were completed. Mechanical removal of overburden, pressure washing, channel-cutting and sampling were conducted on several areas of mineral potential on both properties.

Kenwest Property (27): A 24-hole diamond drill program, totalling 4592 m, was initiated to test several geophysically conductive and anomalous zones and was also designed to examine the mineralization associated with the historical Big Master Mine. Drill hole KW-10-13 intersected 6.1 m grading 15.4 g/t Au and a 5.8 m section from hole KW-10-14 returned 4.8 g/t Au. Manitou Gold Inc. mentioned "the favourable gold bearing structures appear to have exceptional continuity along strike, and contain silica flooding, quartz veining, carbonate and sericite alteration, with visible gold identified in a number of holes. Sulphide mineralization associated with the gold bearing structure is coincident with a prominent 400 metre long induced polarization chargeability anomaly, and presents an exceptional exploration target for follow up drilling" (Manitou Gold Inc., news release, August 19, 2010).

Manitou Gold Inc. also acquired historical data on exploration programs completed on the Big Master Mine. Richard Murphy, president of Manitou Gold Inc. mentions "this is a very important development as these historical records identify a large area of high grade gold mineralization, which we can immediately target with diamond drilling" (Manitou Gold Inc., news release, January 12, 2011).

Canamerica Property (26): The 13 hole, 2037 m Phase I diamond drill program completed in 2010 was designed to test several of the historical mineralized felsic dikes. The part of the Canamerica property targeted by this drill

program is located south of the Kenwest Mine (Figure 2). A 4.5 m section of felsic intrusive rocks intersected in drill hole CA-10-02 graded 2.26 g/t Au (Manitou Gold Inc., news release, September 8, 2010).

Eleven holes, totalling 1839 m, were completed as part of the Phase II diamond drill program that was initiated in 2010. This drill program, which was designed to test gold mineralization at the Little Master prospect, is planned to continue in 2011. The Little Master prospect, which is situated on the Canamerica property, is located 3.1 km north of the Big Master Mine (Figure 2). Historically, gold mineralization has been found in quartz vein systems at the Little Master prospect, and grab samples of quartz material returned up to 169 g/t Au (Manitou Gold Inc., news release, December 3, 2010).

In 2010, prospecting efforts by Manitou Gold Inc. identified additional mineralized zones on the Canamerica property. The Cube Zone, located on the west shore of Upper Manitou Lake (Figure 2), is underlain by a stockwork of quartz veins that contain coarse-grained, disseminated, euhedral pyrite. Mechanical removal of overburden, pressure washing, channel-cutting and sampling was conducted on this zone. The quartz vein system in this area ranges up to 5 m wide. Assay results from grab samples collected during this program returned up to 7.75 g/t Au (Manitou Gold Inc., news release, September 8, 2010).

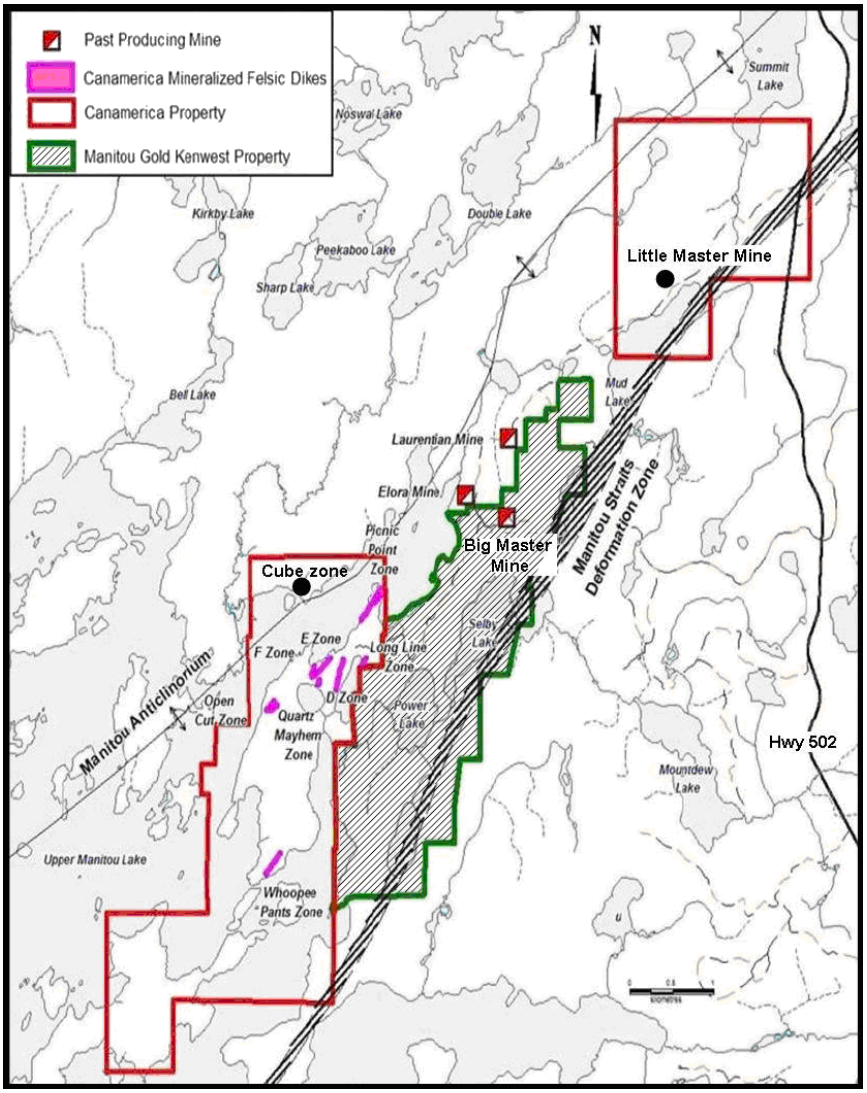


Figure 2. Location of Kenwest and Canamerica gold properties in the Upper Manitou Lake area (locations *from* T. Keast, Manitou Gold Inc., personal communication, January 24, 2011).

Manitou Gold Inc. also acquired the Sherridon (29) gold property in 2009 and initiated an exploration program in 2010. The property, situated south of Upper Manitou Lake, is located approximately 58 km south of the city of Dryden (Figure 3). Prospecting efforts completed by Manitou Gold Inc. identified numerous exposures of sulphide-bearing zones that contained visible gold. Assay results of grab samples from these zones ranged from trace to 617 g/t Au (Manitou Gold Inc., news release, April 19, 2010).

A control grid was established that was designed to cover a majority of the sulphide-bearing zones on the property. Induced polarization surveys were completed over the grid. The conductive responses from this survey technique were determined to be an effective method to identify mineral potential zones (Manitou Gold Inc., news release, September 20, 2010).

Two phases of diamond drilling targeted the conductive zones identified by the geophysical surveys. Numerous intervals of anomalous gold mineralization were intersected in a majority of the 19 drill holes, totalling 3222 m, completed in 2010. Table 5 presents an example of the multiple sections of anomalous gold mineralization intersected during this drill program (Manitou Gold Inc., news releases, December 3 and 17, 1010). Based on these results, exploration activity is planned to continue in 2011.

Table 5. Anomalous gold mineralization from diamond drill program completed on the Sherridon property in 2010.

Drill Hole #	From (m)	To (m))	Width (m)	Au (g/t)
SH-10-17	176.5	178.0	1.5	3.6
	192.0	194.8	2.8	7.1
including	192.0	192.5	0.5	38.7
	221.5	223.5	2.0	1.5
	258.9	260.5	1.7	3.0

Prospecting efforts on an area 1.2 km east of the portion of the property that was tested by this diamond drill program identified another mineralized zone. Grab samples collected from this zone returned up to 40.6 g/t Au. An induced polarization survey is planned for a control grid that will be extended to cover this eastern area (Manitou Gold Inc., news release, December 17, 2010).

Nuinsco Resources Limited (35) initiated an exploration program on the Olympian gold project, located approximately 29 km southeast of the city of Kenora. The land holdings of the Olympian project consist of the Triggs Option and four other option agreements. Efforts in 2010 focused on the historical Triggs Mine, situated on the Triggs Option, but also evaluated the mineral potential of several adjacent gold occurrences.

A 100-metre control grid was established, centred over the historical workings and following the trend of quartz-vein-bearing structures located at the Triggs Mine. Induced polarization and magnetometer surveys, geological mapping and prospecting programs were completed over the grid. A grab sample of quartz vein material excavated from the historical Triggs Mine workings returned 341.81 g/t Au and 23.80 g/t Ag (Nuinsco Resources Limited, news release, June 11, 2010). Mechanical removal of overburden, pressure washing, channel-cutting and sampling was completed on quartz-vein-bearing structures located at the Triggs Mine. These programs were also completed to examine the mineral potential of adjacent mineral occurrences and selected geophysical conductive and anomalous zones.

A 12-hole diamond drill program, totalling 1164 m, mainly targeted the mineral potential of the Triggs Mine. Drill hole NO-10-01 intersected 30 cm grading 20.77 g/t Au. Nuinsco Resources Limited mentions “although the results demonstrate that the local environment is endowed with gold, the levels of gold mineralization obtained from the current program do not reflect the spectacular gold mineralization obtained from the historic Triggs Showing” and the Triggs Option portion of the Olympian project was returned to the optionors (Nuinsco Resources Limited, news release, November 15, 2010).

Pacific Iron Ore Corporation (39) continued work at the St Anthony gold project, located approximately 18 km southeast of the hamlet of Savant Lake. In 2010, 14 diamond drill holes, totalling 4745 m, targeted the gold mineralization within the St Anthony Stock near the part of the felsic intrusive body associated with historical

workings. This drill program was successful in intersecting anomalous gold mineralization over wide intercepts, including higher-grade gold results from quartz veins and altered felsic intrusive rocks. Drill hole SA-10-11 intersected 100 m grading 1.37 g/t Au, including a 2.0 m section that returned 59.25 g/t Au. Pacific Iron Ore Corporation mentions "there appear to be several controls on mineralization which is believed to be related spatially and temporally to the felsic intrusive body" (Pacific Iron Ore Corporation, news release, January 11, 2011). Additional work is planned.

Q-Gold Resources Ltd. (43) continued work on the McKenzie-Gray gold property, located approximately 55 km east of Fort Frances. Exploration efforts in 2010 focused on the mineral potential associated with the McKenzie-Gray quartz vein system and the Jolly Roger quartz vein. An induced polarization survey, which was conducted over these areas in 2010, identified numerous conductive zones (Q-Gold Resources Ltd., news release, November 21, 2010). In 2010, an 18-hole, 2500 m, diamond drill program was designed to extend known mineralized zones and target the conductive zones McKenzie-Gray quartz vein zone.

Q-Gold Resources Ltd. (44) continued work on the Mine Centre gold property, also located approximately 55 km east of Fort Frances. The portion of the property targeted by activity in 2010 is situated approximately 3 km northeast of the McKenzie-Gray deposit. The Baseline, Goldpanner, Jumbo and West veins, which are part of the Foley Mine quartz vein system, were tested by the 16-hole, 2092.5 m, diamond drill program completed in 2010. Based on the results of this program, additional diamond drilling is planned for 2011 (Q-Gold Resources Ltd., Management Discussion and Analysis, November 29, 2010).

Rainy River Resources Ltd. (46) continued an aggressive exploration program at the Richardson Township property, located approximately 55 km northwest of Fort Frances. These efforts continued to expand the mineral reserves at the 17/ODM gold deposit, and to explore for additional mineralized areas adjacent to the known gold zones on the property.

The company announced an updated mineral resource estimate on the Richardson Township gold zones in 2010 (Table 7). This revised estimate upgrades the 2009 historical resource values presented in Table 6. The estimates presented in the tables are combined values for the underground and open-pit resources.

Table 6. Historical mineral resource estimate of the Richardson Township gold zones (cut-off grades: open pit 0.4 and underground 3.0 g/t Au) (Cole et al. 2009).

Resource Category	Tonnes	Au (g/t)	Au (ounces)	Ag (g/t)	Ag (ounces)
Indicated	55 615 000	1.24	2 225 000	1.89	3 375 000
Inferred	64 003 000	0.88	1 807 000	2.21	4 548 000

The 2010 estimate upgrades the historical resource estimate of the 17/ODM deposit, including the economic mineralization at the Beaver Pond, 433 and Cap gold zones (Table 7). The database for this estimate comprised 662 diamond drill holes, totalling approximately 273 027 m. This diamond drilling was completed by Nuinsco Resources Inc. (1994–2004) and Rainy River Resources Ltd. (September 2005–December 2009). The mineral evaluation also presented information on the open pit and underground mineral extraction options, including parameters on pit slopes, gold recovery rates and estimates on mining process costs (Rainy River Resources Ltd., news release, March 2, 2010).

Table 7. Revised mineral resource estimate of the Richardson Township gold zones (cut-off grades: open pit 0.4 and underground 3.0 g/t Au) (Rainy River Resources Ltd., news release, March 2, 2010).

Resource Category	Tonnes	Au (g/t)	Au (ounces)	Ag (g/t)	Ag (ounces)
Indicated	56 833 000	1.30	2 370 000	1.81	3 314 000
Inferred	68 930 000	1.20	2 659 000	2.73	6 041 000

Rainy River Resources Ltd. completed 191 diamond drill holes totalling approximately 107 738 m on the Richardson Township property in 2010. A majority of these drill holes targeted the 17/ODM and 433 gold zones and were designed to upgrade the mineralization from inferred to indicated resource category. The results from the

diamond drill holes completed in 2010 will be included in an updated mineral resource estimate, which is planned to be released in 2011 (Rainy River Resources Ltd., news release, January 11, 2011).

Significant assay results from this diamond drill program comprise a 4.5 m interval grading 407.9 g/t Au, including a 1.5 m section that returned 1222.2 g/t Au in hole NR10-532, which tested the 17/ODM gold zone (Rainy River Resources Ltd., press release, August 31, 2010). Rainy River Resources Ltd. continues to re-log and sample historical diamond drill holes in 2010. A 1.5 m sample collected from drill hole NR06-60, which targeted the 17/ODM gold zone, returned 51.2 g/t Au (Rainy River Resources Ltd., news release, June 20, 2010).

A program that involved the extension of 53 historical diamond drill holes was also initiated in 2010. An extension of drill hole NR06-42E, which targeted the 433 gold zone, intersected 5.5 m grading 128.5 g/t Au, including a 1.5 m interval that returned 542 g/t Au (Rainy River Resources Ltd., news release, June 9, 2010).

In 2010 three areas, which are situated west and north of the conceptual pit boundary and surface projection of the Richardson Township gold zones, were tested by 34 reverse-circulation till and bedrock holes ("OVD"). A bedrock sample from OVD hole RC-214, which targeted the area north of the 17/ODM gold zone, returned 6.17 g/t Au (Rainy River Resources Ltd., news release, April 20, 2010).

Rainy River Resources Ltd. and the Fort Frances Chiefs Secretariat, Fort Frances Tribal Council, which represents a number of First Nation communities in the area, entered into a Memorandum of Understanding regarding future exploration and development activities on the Rainy River project, including the Richardson Township property (Rainy River Resources Ltd., news release, May 12, 2010).

In 2010, Rainy River Resources Ltd. initiated fulfilling the requirements to obtain an Advanced Exploration permit to establish underground access to the Richardson Township gold zones. The underground access will allow the collection of a bulk sample from the mineralized zones and provide underground diamond drill stations to access the depth extensions of the zones (Rainy River Resources Ltd., news release, August 19, 2010).

Treasury Metals Inc. (53) continued exploration work on the Goliath gold project, located in Zealand Township, approximately 20 km east of Dryden. A majority of these efforts targeted the mineral potential of the Thunder Lake gold deposit.

A 27-hole, 10 344 m, diamond drill program completed in 2010 mainly tested the high-grade mineralized structures associated with the Main Zone at the Thunder Lake gold deposit. Significant assay results from this program included drill hole TL 10-98, which intersected 10.5 m grading 7.47 g/t Au and a 1 m section from hole TL 10-108 that returned 43.44 g/t Au (Treasury Metals Inc., news release, June 21, 2010).

In 2010 Treasury Metals Inc. announced the results of a Preliminary Economic Assessment ("PEA") on the Goliath gold project. A PEA is the first level of engineering study that is performed on a mineral deposit to determine its economic viability. This is usually performed to determine whether the expense of a pre-feasibility study and later full feasibility study is warranted. The PEA concluded the Goliath gold project has potential economic viability and the following are recommended to advance toward pre-feasibility (Treasury Metals Inc., news release, July 13, 2010):

- infill drilling to upgrade Inferred Resources to Indicated Resources, aimed at increasing total gold ounces, to be considered in future economic/production models;

- collect material for further metallurgical test work to include gravity, flotation and cyanidation mineral processing, optimised to confirm recoveries used in the economic model;

- collect geotechnical information to be used for surface and underground mine planning;

- optimization of economic model by investigating purchase of a used mill instead of construction of new mill; and

- initiation of Environmental Baseline studies as soon as possible.

In 2010 Treasury Metals Inc. initiated an environmental baseline study on the Thunder Lake Deposit as part of the preliminary assessment study. Environmental baseline studies included wildlife, ecosystem, soil, vegetation, fish habitat, and sediment and water quality surveys. This study is planned to continue in 2011 (Treasury Metals Inc., news release, January 21, 2011).

The PEA also presented a mineral resource estimate for the Thunder Lake gold deposit (Roy et al. 2010). The database for this estimate (presented in Table 9) comprised 535 diamond drill holes, totalling approximately 90 295.7 m. This diamond drilling was completed by Teck Resources Limited (1990–1998) and Treasury Metals Inc. (2008–2009). Table 8 presents a summary of this drill hole database.

Table 8. Diamond drill holes used in mineral resource estimate (Roy et al. 2010).

Company	Collar Location	No. of Drill Holes	Length (m)
Teck Resources Limited	surface	237	71 959.4
Teck Resources Limited	underground	213	691.3
Treasury Metals Inc.	surface	85	17 645.0

Table 9. Mineral resource estimate of the Thunder Lake gold deposit (cut-off grades: surface 0.5 and underground 2.0 g/t Au) ((Roy et al. 2010).

Zone	Tonnes	Au (g/t)	Au (ounces)	Ag (g/t)
Indicated				
Surface	2 900 000	1.9	180 000	5.4
Underground	490 000	5.7	90 000	13.8
Total Indicated	3400 000	2.5	270 000	6.6
Inferred				
Surface	5 400 000	1.1	190 000	2.5
Underground	5 200 000	4.4	740 000	14.7
Total Inferred	10 600 000	2.7	930 000	8.5

In 2010 mechanical removal of overburden, pressure washing, channel-cutting and sampling were conducted in the area estimated to be the surface projection of the Thunder Lake gold deposit main mineralized zone. The rocks in this area are covered with a thick layer of overburden. A 0.55 m channel-cut sample interval collected during this program returned 49.06 g/t Au (Treasury Metals Inc., news release, September 8, 2010).

A second phase of diamond drilling was initiated in 2010. Only six holes, totalling approximately 1816 m, were completed during the program. This drill program, which was mainly designed to upgrade the Thunder Lake gold deposit from inferred to indicated resource category, is planned to continue in 2011. Treasury Metals Inc. indicated that the drill program will also be testing the following revised theory on the structures related to the mineralizing events associated with the Thunder Lake deposit (Treasury Metals Inc., news release, December 8, 2010):

> Two distinct structures were identified: F1 structures which are characterized by intense folding, an east-west strike and a southwest plunge; and, a second set of structures (F2) that intersect and fold the F1 structures. The Company's structural geologist believes that the best potential for highest gold concentrations is at or near the F1-F2 intersections and in areas where there is an increased density of F2 structures, resulting in the formation of high-grade shoots.

Historical diamond drill programs were oriented to intersect the F1 structure. Treasury Metals Inc. plans to orient the diamond drill holes to intersect the F2 structures during this phase of the program (Treasury Metals Inc., news release, December 8, 2010).

Copper and Gold

Opawica Explorations Inc. (37) continued work on the Atikwa Lake copper-gold property, located approximately 70 km southeast of Kenora. Opawica Explorations Inc. announced the results of a Preliminary Scoping Study ("PSS") and economic analysis on the Maybrun Cu-Au deposit on the Atikwa Lake gold and copper property. Laakso et al. (2010) states:

> …this 1000 TPD Preliminary Scoping Study has been commissioned to determine if preliminary economic considerations may be applied to a higher grade and accessible 2,800,000 tonnes portion, at surface, within the overall 7,366,000 Indicated resource of the Maybrun open pit Main zone. The objective is to determine if the past footprint of the 500 TPD Maybrun Mine can be utilized in re-instating production at least 1000 TPD on a shorter timeline and at significantly lower capital cost.

In 2010, two phases of diamond drilling, which mainly targeted mineralization associated with the Maybrun Main and Maybrun Footwall zones, were completed. The results from 4 holes, totalling 1931 m, completed in the initial phase of drilling were incorporated in the PSS. Based on the positive results from the PSS, 20 drill holes, totalling 2462 m, targeted mineralization in the open-pit portion of the Maybrun Main zone. Additional diamond drilling is planned for 2011.

Orthomagmatic Base Metals and Platinum Group Elements

Puget Ventures Inc. (42) continued work on the Werner Lake Mineral Belt property, approximately 87 km north of Kenora. The area covered by this 1700 h property is underlain by a majority of the known orthomagmatic mineralized zones of the Werner Lake greenstone belt, including the historical Norpax Ni-Cu and Werner Lake Co deposits (Table 14).

Thirty-four holes totalling approximately 7616 m were completed during two phases of diamond drilling in 2010. These drill programs were designed to confirm the presence of mineralization associated with the historical resource estimate and provide information toward geotechnical studies on the geological setting of the Werner Lake West Cobalt deposit zone. Drill hole WL-10-004 intersected 12.3 m that returned 1.21% Co, including 0.9 m grading 12.48% Co (Puget Ventures Inc., news release, April 19, 2010).

In 2010 prospecting and geological mapping were completed on several areas of the property. The Eastern Extension zone, located 800 m east of the Werner Lake West Cobalt deposit, and historical occurrences situated west of the Norpax Ni-Cu deposit, were targeted by these programs. Puget Ventures Inc. also announced the intention to change the company's name to Global Cobalt Corporation (Puget Ventures Inc., news release, September 20, 2010).

Rare Metals

Consolidated Abaddon Resources Inc. (10) initiated an exploration program on the Raleigh Lake rare-metal property located approximately 20 km west of the town of Ignace. A seven-hole, 1464 m diamond drill program targeted historical rare-metal-bearing pegmatite situated on the property. Pegmatite was intersected in all 7 holes completed during this program, with several pegmatite intervals ranging up to 11 m in width (Consolidated Abaddon Resources Inc., news release, March 9, 2010). Significant results from this Phase I drill program include 4.7 m grading 0.84% Li from hole RL10-1, including a 2.2 m section within this interval which returned 1.1% Li. Drill hole RL10-2 intersected 9.0 m grading 1.3% Li (Consolidated Abaddon Resources Inc., news release, April 14, 2010). Consolidated Abaddon Resources Inc. also announced its intention to change the company's name to Aben Resources Ltd. (Consolidated Abaddon Resources Inc., news release, January 11, 2011).

Volcanogenic Massive Sulphides

Excalibur Resources Ltd. (15) initiated an aggressive exploration program on the Sturgeon Lake zinc-copper property, located 60 km northeast of the town of Ignace and situated approximately 18 km east of the historic

Mattabi zinc-copper mine site. The program was designed to examine the volcanogenic massive sulphide mineralization potential of the property.

A control grid was established to cover the conductive and anomalous areas identified from a 2009 airborne electromagnetic and magnetometer geophysical survey. Geological mapping, enzyme leach, and soil gas hydrocarbon geochemical surveys were completed over the grid. In 2010, Excalibur Resources Ltd. increased their holdings by staking additional land in the area.

In 2010, a 21-hole, 3784 m diamond drill program was designed to test the anomalous areas identified from the geochemical surveys. Disseminated to massive sulphides—including pyrrhotite, pyrite with secondary amounts of chalcopyrite and sphalerite—were intersected by most of the drill holes completed during this program (Excalibur Resources Ltd., press release, September 23, 2010).

Rainy River Resources Ltd. (45) resumed work on the Off Lake property, northwest of Fort Frances. This area, part of the Rainy River project, is located approximately 16 km northeast of the 17/ODM Gold Zone. Two phases of diamond drilling targeting the mineral potential of two areas on the property were completed in 2010. The Phase I drill program was designed to locate the bedrock source of high-grade float found on the east shore of Off Lake. In 2007 mechanical removal of overburden, pressure washing, channel-cutting and sampling was conducted on the Burnell showing, located approximately 400 m north of the float. In 2010, a 4-hole, 1084 m, diamond drill program was designed to determine if the Burnell showing was the source of the float.

Prospecting efforts in 2009 at the Cx zone located a high-grade float, and a grab sample collected from the boulder returned values of 10.45 g/t Au, 46.9 ppm Ag and 7.52% Zn (Baker 2010). The Cx zone, located approximately 6.7 km northwest of the Burnell showing, was the target of the Phase II diamond drill program in 2010. This 4-hole, 614 m diamond drill program was designed to determine if the Cx zone is the source of the high-grade float.

Table 10. Exploration activity conducted in the Kenora District in 2010. Locations are illustrated in Figure 3.

Abbreviations

AEM	Airborne electromagnetic survey	IP	Induced polarization survey
AM	Airborne magnetic survey	IS	Public information sessions
Bulk	Bulk sampling program	Lc	Linecutting
CC	Channel cutting	LSS	Lake sediment sampling
Comp	Compilation	Met	Metallurgical studies
DDE	Extension of historical diamond drill hole(s)	MRE	Mineral Resource Estimate (NI43-101)
DDH	Diamond drill hole(s)	MS	Marketing studies
DDR	Diamond drill hole(s) re-logging	OVD	Overburden drill hole(s)
DW	De-watering underground workings	PEA	Preliminary Economic Assessment study
EBS	Environmental baseline studies	Pr	Prospecting
GEM	Ground electromagnetic survey	Samp	Sampling (other than bulk)
GC	Geochemical survey	SC	Scoping studies
GL	Geological Survey	Str	Stripping
GM	Ground magnetic survey	Tr	Trenching
GMI	Ground magnetic response interpretation	VLFEM	Very low frequency electromagnetic survey

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
1	Abitibi Mining Corp. (Redhat–Centre Fire Property)	McIlraith Township (Cu, Zn, Au)	AEM, AM
2	Angove, R. (Angove Property)	Sakite Lake area (Au)	Pr, Samp
3	Angove, R. (Polygon Lake Property)	Bennett Lake area (Au)	Pr, Samp
4	Bayfield Ventures Ltd. (B Block Property)	Richardson Township (Au)	DDH 11-4473 m, AEM, AM, GL, Samp

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
5	Bayfield Ventures Ltd. (Burns Block Property)	Richardson Township (Au)	DDH 54-19 311 m, AEM, AM, GL, Samp
6	Bending Lake Iron Group Ltd. (Bending Lake Property)	Bending Lake area (Fe)	Bulk, Str, CC, Lc, GL, Pr, Samp
7	Brandenburg Metals Corp. (Pattullo Block Property)	Patullo and Tait townships (Au)	Comp
8	Canadian Arrow Mines Limited (Glatz – Turtlepond Lake Project)	Turtlepond Lake area (Ni, Cu)	DDH 11-885 m, Samp
9	Champion Bear Resources Ltd. (Plomp Farm Property)	Aubrey Township (Au, Ag)	Comp, GL, Pr, Samp
10	Consolidated Abaddon Resources Inc. (Raleigh Lake Property)	Raleigh Township (Li, Cs, Rb, Ta)	DDH 7-1464 m, Samp, Comp
11	Coventry Resources Limited (Cameron Lake Property)	Rowan Lake area (Au)	MRE, DDH 111-16 813 m, AM, IS, Lc, GL, IP, Comp, Samp
12	Delta Uranium Inc. (Kenora Uranium Project)	MacNicol to Langton townships (U, REE)	Comp, Samp
13	Everton Resources Inc. (Shoal Lake East (Mikado) Property)	Ewart Township (Au)	MRE, AM, Comp
14	Everton Resources Inc. (Shoal Lake West (Duport) Property)	Shoal Lake area (Au)	DDH 28-8271 m, Samp, Lc, Comp
15	Excalibur Resources Ltd. (Sturgeon Lake Property)	Bell Lake area (Cu, Zn)	Comp, Lc, GL, GC, GM, GEM, Samp, DD 21-3784 m, staking
16	Glatz, A. & Riives, J. (Howey Lake Property)	Kawashegamuk Lake Area (Au)	Pr, Samp
17	Gold Summit Corporation (Sakoose Property)	Tabor Lake area (Au)	Pr, Samp, DDR
18	Healey, D. (Wendy Block Property)	Code Township (Au)	Pr, Samp
19	Houston Lake Mining Inc. (West Cedartree Gold Project)	Dogpaw Lake area (Au)	DDH 45-8100 m, Comp, GL, Str, CC, Pr, Lc, Samp
20	International Millennium Mining Corp. (Hope Lake Property)	Lobstick Bay area (Au)	Str, CC, GL, Samp
21	International Precious Metals Group Inc. (Queen Alexandria Property)	Lower Manitou Lake area (Au)	GL, Pr, VLFEM, Samp
22	International Precious Metals Group Inc. (Sakoose Property)	Vista Lake area (Au)	GL, Pr, VLFEM, Samp
23	King's Bay Gold Corporation (Menary Property)	Menary Township (Au)	DDH 16-1500 m, Lc, GL, GM, VLFEM, Samp
24	Laurentian Goldfields Ltd. (Van Horne Property)	Contact Bay area (Au)	Comp, GL, Samp
25	Mainstream Minerals Corporation (Rowan Lake Property)	Rowan Lake area (Au)	AEM, AM
26	Manitou Gold Inc. (Canamerica Property)	Boyer Lake area (Au)	DDH 21-2876 m, Str, CC, Lc, IP, GM, Pr, Samp, staking
27	Manitou Gold Inc. (Kenwest Property)	Boyer Lake area (Au)	DDH 24-4592 m, Str, CC, Lc, IP, GM, Pr, Samp
28	Manitou Gold Inc. (Higbee Property)	Garnet Lake area (Au)	Lc, IP, GM

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
29	Manitou Gold Inc. (Sherridon Property)	Lower Manitou Lake area (Au)	DDH 19-3222 m, Lc, IP, GM, Samp, staking
30	Mega Graphite Inc. (Separation Rapids Property)	Paterson Lake area (Li, Cs, Rb, Ta)	Comp, acquired from Pacific Iron
31	Metalore Resources Ltd. (East Cedartree Lake Property)	Dogpaw Lake area (Au)	DDH 7-1284 m, Lc, DDR, Pr, Str, Samp, staking
32	Metals Creek Resources Corp. (Dogpaw Lake Property)	Dogpaw Lake area (Au)	GL, Pr, Lc, IP, Samp
33	Mineral Mountain Resources Ltd. (Straw Beach Property)	Bluffpoint Lake area (Au)	Comp, GL, Pr, Samp
34	MPH Ventures Corp. (Pidgeon Property)	Echo Township (Mo, Cu)	Comp
35	Nuinsco Resources Limited (Olympian Property)	Code Township (Au, Cu)	Comp, DDH 12-1164 m, Str, CC, GL, Pr, Lc, GM, IP, Samp
36	Numax Resources Inc. (Mine Centre Property)	Bliss Lake area (Fe, Ni, Cu, Pd, Pt, Au)	DDH 3-810 m, GL, GC, DDR, Comp, Samp
37	Opawica Explorations Inc. (Atikwa Lake Property)	Atikwa Lake area (Cu, Au)	DDH 24-4393 m, Samp, SC, Comp
38	Pacific Iron Ore Corporation (Scarp Lake Property)	Garnet Lake area (Cu, Au, REE)	DDR, Samp
39	Pacific Iron Ore Corporation (St Anthony Property)	Squaw Lake area (Au)	DDH 14-4745 m, Comp, Str, Samp
40	Paragon Minerals Corporation (Gold Star Property)	Squaw Lake area (Au)	Comp, GL, Str, CC, Pr, Samp, staking
41	Pathfinder Gold Inc. (Turtle Tank Property)	Little Turtle Lake area (Au)	DDH 3-112.5 m, GL, Str, CC, Pr, Samp
42	Puget Ventures Inc. (Werner Lake Mineral Belt Property)	Rex – Werner lakes area (Co, Cu, Ni, PGEs)	DDH 34-7616 m, Pr, GL, Samp
43	Q-Gold Resources Ltd. (McKenzie Gray Project)	Bad Vermilion Lake area (Au, Ag)	DDH 18-2500 m, Lc, IP, Samp
44	Q-Gold Resources Ltd. (Mine Centre Project)	Bad Vermilion Lake area (Au)	DDH 16-2092.5 m, Lc, IP, Samp
45	Rainy River Resources Ltd. (Off Lake Property)	Fleming and Potts townships (Zn, Cu, Au)	DDH 8-1725 m, Samp
46	Rainy River Resources Ltd. (Richardson Township Property)	Richardson Township (Au, Cu, Zn, PGE)	DDH 191-107 738 m, MRE, DDE, Lc, IS, OVD 34-723 m, Samp
47	Sodi Ventures Inc. (Cameron Lake Blocks A, B Property)	Rowan Lake area (Au)	Comp, AEM, AM
48	Sodi Ventures Inc. (Rainy River Block A Property)	Pattullo Township (Au)	Comp, AEM, AM
49	Sodi Ventures Inc. (Rainy River Block B Property)	Menary Township (Au)	Comp, AEM, AM
50	Sodi Ventures Inc. (Rainy River Block C Property)	Dash Lake area (Au)	Comp, AEM, AM
51	Tamaka Gold Corporation (Goldlund Project)	Echo Township (Au)	Comp, Pr, Samp
52	Teck Resources Limited (Thundercloud Lake Property)	Boyer Lake Area (Au)	Comp, GL, Pr, Samp

No.	Company/Individual (Occurrence Name or Property)	Township/Area (Commodity)	Exploration Activity
53	Treasury Metals Inc. (Goldcliff Property)	Boyer Lake area (Au)	Pr, Samp, staking
54	Treasury Metals Inc. (Goliath Property)	Zealand Township (Au)	DDH 33-12 160 m, PEA, EBS, MRE, Str, CC, Samp
55	United Reef Limited (Santa Maria Property)	Kawashegamuk Lake area (Au)	Pr, Samp
56	Unitronix Corp. – 3936449 Canada Inc. (Sturgeon Lake Property)	Penassi Lake area (Au, Cu, Zn)	Comp, Pr, GL, Samp
57	Wetelainen, H. (Pathfinder Property)	Melgund Township (Au)	Str, GL, CC, Samp
58	Xstrata Canada Corporation (Claw Lake Property)	Bell Lake area (Zn, Cu)	Pr, Samp

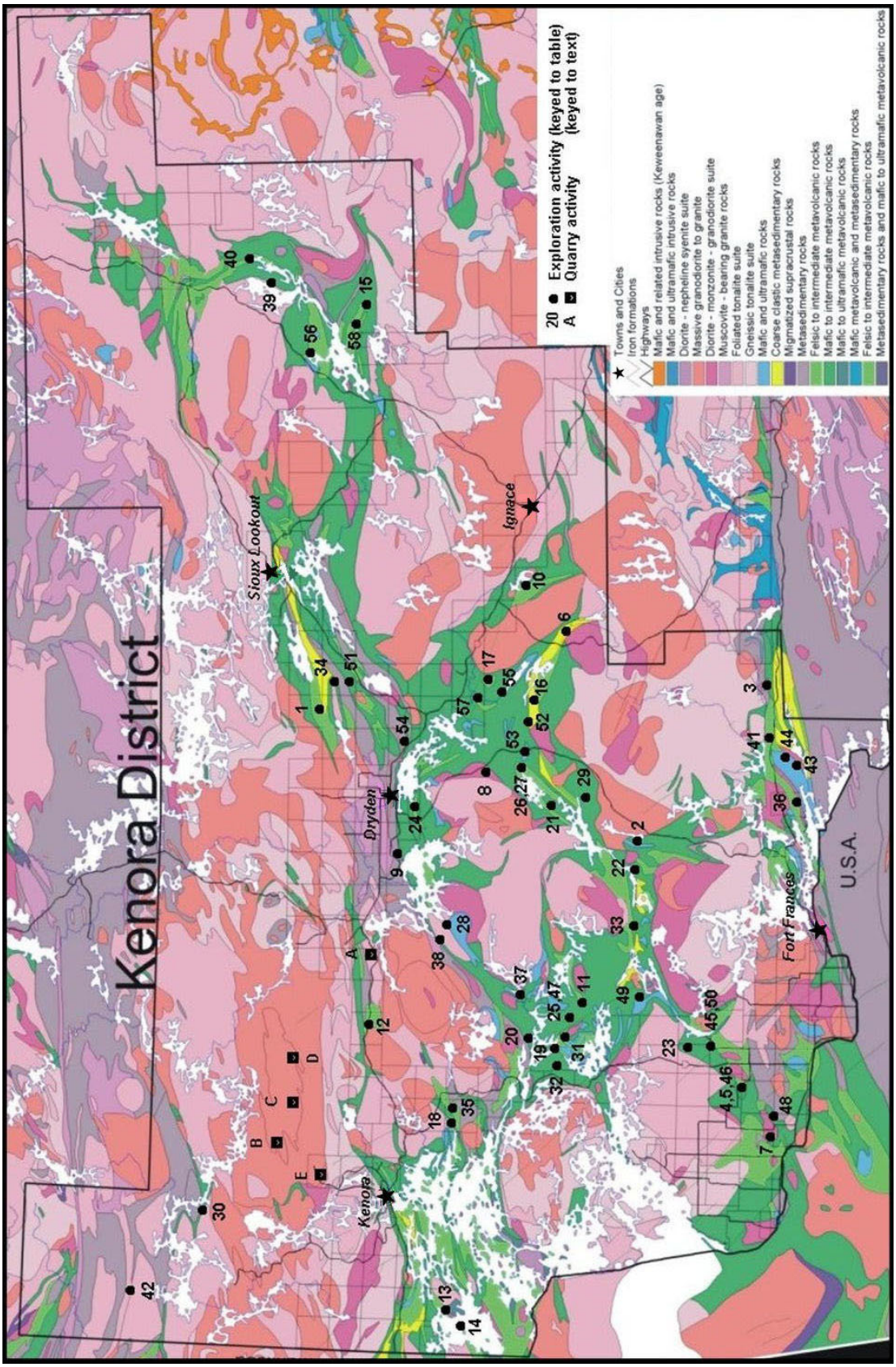


Figure 3. Exploration and quarry activity conducted in the Kenora District in 2010 (*modified from* OGS 2003). Locations listed in Table 10 and in text.

KENORA DISTRICT STAFF AND ACTIVITIES

The Kenora office was staffed by C. Ravnaas, *P.Geo.*, District Geologist; J. Bongfeldt, District Geological Assistant; K. Kitt, acting District Geological Assistant; and S. Wilcott, summer assistant (Summer Experience Program).

Kenora staff attended the following conferences and symposia:

- presented posters on provincial bedrock geology and airborne magnetometer response and participated in the Prospectors and Developers Association of Canada Convention (PDAC) held in Toronto in March;
- presented a poster and oral presentation highlighting activities in the district at the Northwestern Ontario Mines and Minerals Symposium held in Thunder Bay in April;
- participated in the 56th Annual Institute of Lake Superior Geology field trips at Richardson Township gold deposit, McKenzie Gray gold deposit, Foley Mine gold deposit, Mine Centre iron-titanium prospect and Beaver Pond copper-nickel prospect, held in Fort Frances in April; and
- presented a poster highlighting metal producers and significant exploration activity in northwestern Ontario at the Manitoba Mining and Minerals Convention held in Winnipeg, Manitoba in November.

J. Bongfeldt initiated 2 six-month Mineral Deposit Inventory (MDI) reviews of a portion of the Kenora District. A total of 230 MDI records were edited during this program. These efforts were concentrated on the portion of the Kenora District that is covered by the Precambrian Geoscience Program multi-year Western Wabigoon Synthesis.

Kenora staff attended the following First Nation meetings:

- presented a booth displaying mineral sector employment opportunities at the Lac Seul First Nation Career Day and the Relationship Building Workshop, Treaty No.3 Best Practice and Relationship Building workshop held in Frenchman Head in July; and
- presented an oral presentation on mineral exploration employment opportunities at the Shooniya Wa-Biitong training and employment centre workshop held in Kenora in March.

Kenora staff participated in the following workshops:

- Applied Structural Geology in Exploration – deciphering ore plunge control in your deposit: short course held at the PDAC in Toronto;
- Strategic Communication for the Mineral Industry: short course held at the PDAC in Toronto;
- co-authored the Rare Earth Element and Rare Metal: short course delivered during the Northwestern Ontario Mines and Minerals Symposium in Thunder Bay;
- participated in a Fish Friendly Stream Crossing workshop held in Kenora;
- completed the Surface Miner Common Core Program #770210 and WHMIS courses delivered by NORCAT in Sudbury;
- completed the St. John Ambulance Emergency First Aid and Level B CPR course in Kenora; and
- completed the Bill 168 e-learning modules Workplace Discrimination and Harassment Prevention and Workplace Violence Prevention courses.

Kenora staff participated in the following Mines and Minerals sessions:

- participated in a Mineral Development Sequence workshop presented by MNDMF Mines and Minerals staff and delivered an exploration site tour to selected staff from the Ministry of Natural Resources, Kenora office, and attended the Resident Geologist Program annual meeting held in Sudbury.
- The Kenora office organized and delivered a mineral exploration information session, held in Dryden, to approximately 98 participants in August.

In 2010, 33 property visits were conducted by Kenora District Office staff (Table 11; Figure 4).

Table 11. Property and field examinations conducted by the Kenora District Geologist in 2010. Locations are keyed to Figure 4.

Number	Client – Occurrence
1	Avalon Rare Metals Inc. – Big Whopper Li deposit
2	Bending Lake Iron Group Ltd. – Bending Lake Fe deposit
3	Coventry Resources Limited – Beggs Au occurrence
4	Coventry Resources Limited – Cameron Lake Au deposit
5	Everton Resources Inc. – Shoal Lake West (Duport) deposit
6	Friesen, W. – Richardson Township Au showing
7	Glatz, A. and Riives, J. – Van Houten Au occurrence
8	Houston Lake Mining Inc. – Dogpaw Lake Au deposit
9	Houston Lake Mining Inc. – Robertson Au occurrence
10	Manitou Gold Inc. – Big Master Au deposit
11	Manitou Gold Inc. – Canamerica East Au occurrence
12	Manitou Gold Inc. – Gold Rock Au occurrence
13	Manitou Gold Inc. – Mayham Au occurrence
14	Mega Graphite Corp. – Big Mack Li deposit
15	MetalCORP Limited – Beaverpond Ni-Cu prospect
16	MetalCORP Limited – GUP diamond occurrence
17	Metalore Resources Limited – East Cedartree Au prospect
18	Nuinsco Resources Limited – Triggs Au occurrence
19	Numax Resources Inc. – Mine Centre Fe-Ti-V exposures
20	Oquist, J. – Richardson Township Au showing
21	Pacific Iron Ore Corporation – St Anthony Au deposit
22	Paragon Minerals Corporation – Mile Lake Au occurrence
23	Paragon Minerals Corporation – Thomas Lake Au occurrence
24	Q-Gold Resources Ltd. – Foley Au deposit
25	Q-Gold Resources Ltd. – McKenzie-Gray Au deposit
26	Rainy River Resources Ltd. – Off Lake Zn-Cu-Au occurrence
27	Rainy River Resources Ltd. – Richardson Township Au deposit
28	Staff examination – Cameron Lake volcanic rocks
29	Staff examination – Campbell-McFarlane U occurrence
30	Staff examination – Caution Lake granite showing
31	Staff examination – Mikado Au deposit
32	Staff examination – Neepawa Island Au occurrence
33	Treasury Metals Inc. – Thunder Lake Au deposit

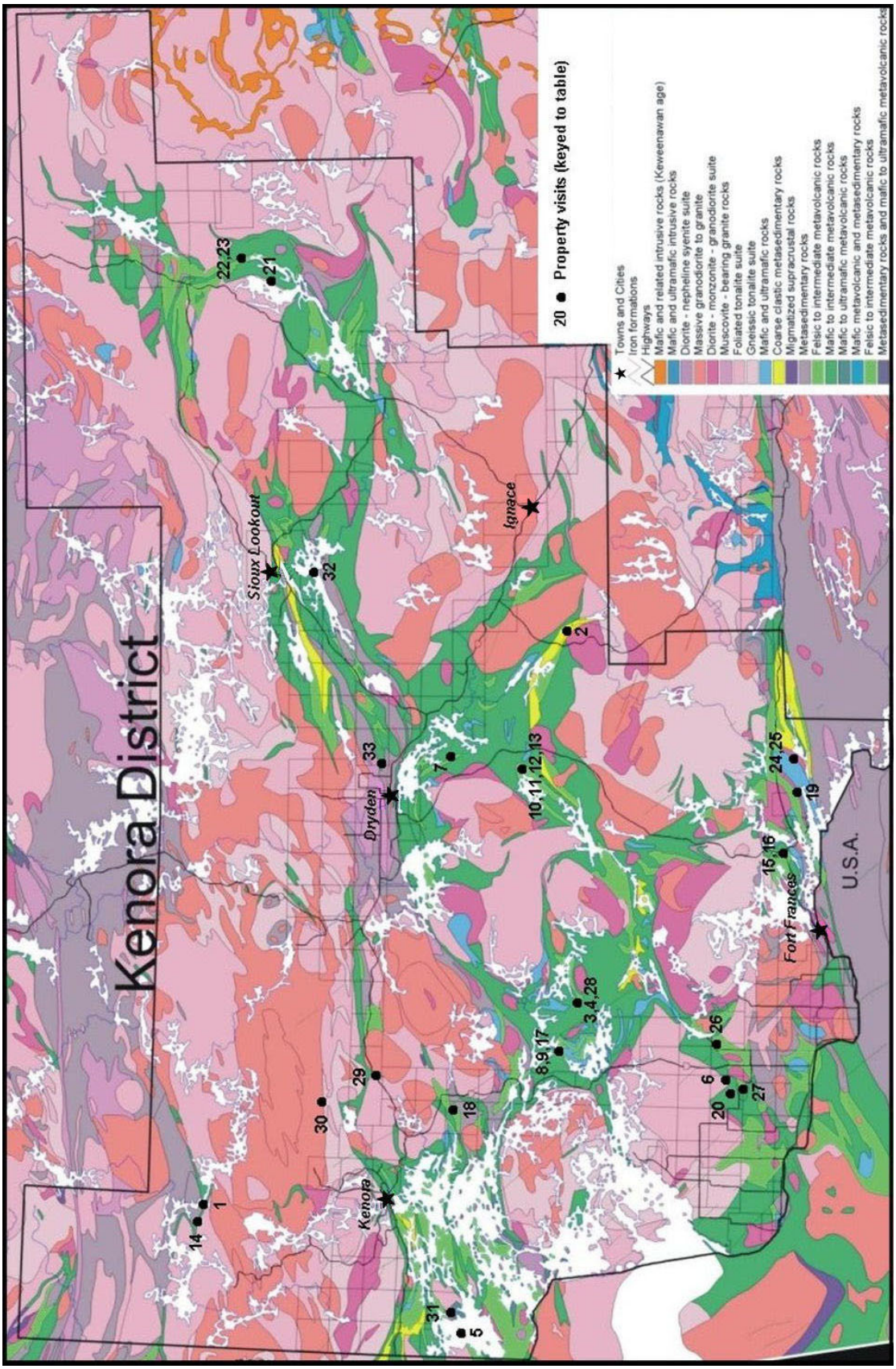


Figure 4. Property visits and field examinations conducted in the Kenora District in 2010 (*modified from* OGS 2003). Locations listed in Table 11.

PROPERTY EXAMINATIONS

All Universal Transverse Mercator (UTM) co-ordinates are in North American Datum 1983 (NAD83), Zone 15. Analytical values presented in tables and text, unless indicated otherwise, were processed through the Geoscience Laboratories (Geo Labs), Ontario Geological Survey, in Sudbury.

Rare Earth Element Potential of Scarp Lake Property

The Scarp Lake property is located approximately 47 km southwest of the city of Dryden. The property, held by Pacific Iron Ore Corporation, is located along the southeast shore of Scarp Lake. Access to Scarp Lake is via boat, traveling approximately 8 km along Piskegomang Creek from Eagle Lake.

The central and western portions of the area are underlain by mafic volcanic rocks. The Higbee Lake felsic intrusive body is located east of Scarp Lake. This dominantly granodiorite intrusive body contains 5-8% blue quartz phenocrysts (Davies and Watowitch 1955). The Wabigoon Fault occurs at the contact of the mafic volcanic rocks with the Higbee Lake felsic intrusive rocks (Figure 6).

Felix (2005) demonstrated that there is a concentration of samples sites in the western part of the Higbee Lake felsic intrusion that return highly anomalous rare-earth element (REE) values (Figure 5).

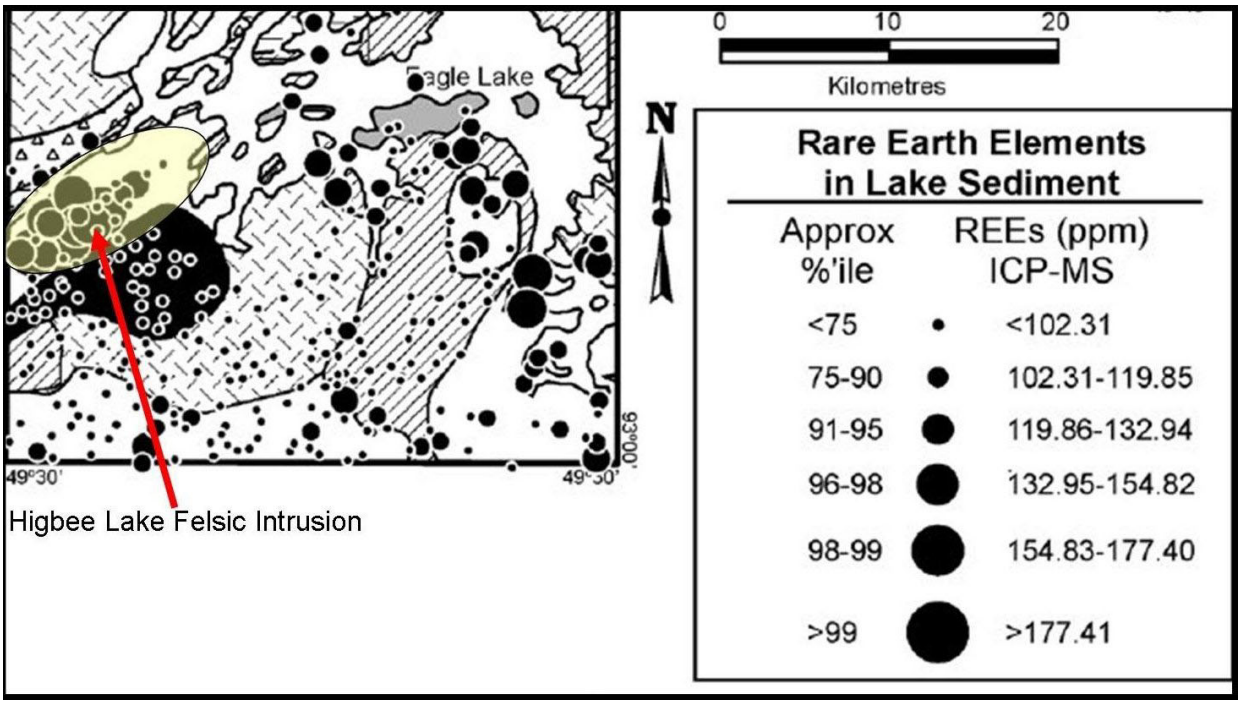


Figure 5. Lake sediment sample sites in Higbee Lake felsic intrusion that returned anomalous REE values (*modified from* Felix 2005).

The Scarp Lake Cu-Au occurrence, located in the western part of the Higbee Lake intrusion, is situated approximately 480 m east of Scarp Lake (Figure 6). Kenora staff (Hinz et al. 2005) mention that the Scarp Lake quartz-copper-gold mineralized zone is "characterized by intense alteration, which grades outward into a surrounding weakly altered zone. The original quartz porphyritic granodiorite has undergone hydrothermal alteration comparable to low to middle amphibolite grade, involving strong feldspar destruction and development of biotite-chlorite-hornblende". This alteration zone appears to trend northeast, which is parallel to the direction of the fractures that host the mineralization at the Scarp Cu-Au occurrence.

The objective of this site visit was to collect representative grab samples of unaltered felsic intrusive rocks of the Higbee Lake body adjacent to the Scarp Lake occurrence alteration zone. Attempts were made to select unaltered and sulphide-barren samples. A traverse was oriented perpendicular to the trend of the Scarp Lake occurrence alteration zone. The interval between samples collected from the unaltered felsic intrusive rock was approximately 125 m. Sites within the alteration zone that were silicified, contained quartz or sulphides were not sampled.

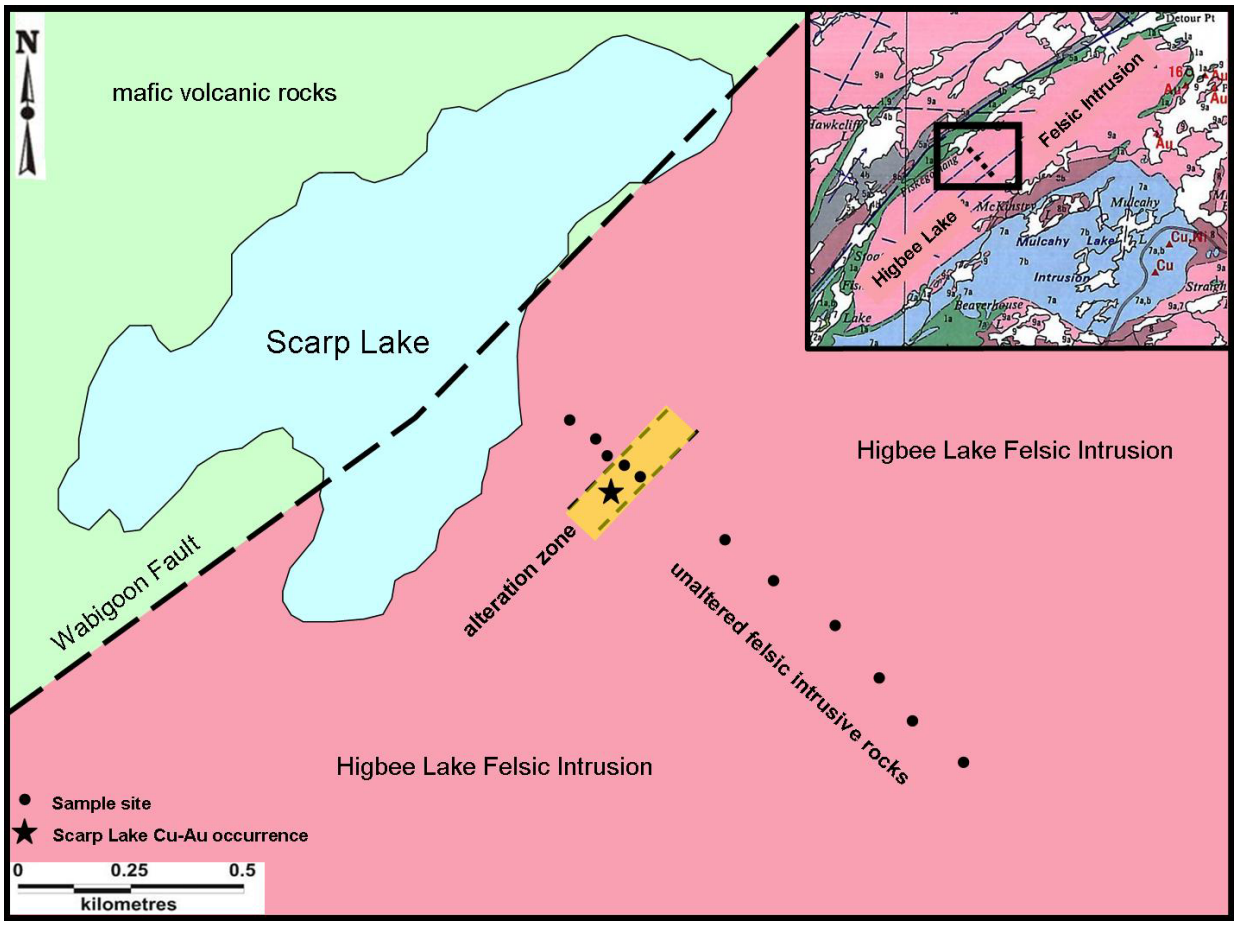


Figure 6. Location of sample sites at the Scarp Lake occurrence (*modified from* Blackburn 1978).

The REE values of the samples collected from the unaltered Higbee Lake intrusive rocks were compared to the results from samples representative of the rocks that underlie the Scarp Lake Cu-Au occurrence alteration zone (Table 12). Hydrothermal systems within felsic intrusive rocks can host REE mineralization (Pell 1996). Ravnaas and Bongfeldt (2009) also present a summary of rock types and geological settings that have potential to host REE mineralization.

Due to the low density of sites examined and samples collected during this visit, the assay results presented in Table 12 are not a good representation of the average REE content of the Higbee Lake felsic intrusion. Nonetheless, the average elemental values of samples collected from this part of the Higbee Lake intrusion are compared to the typical REE continental crust values of Taylor and McLennan (1995) (Table 12).

Table 12. Average REE assay values of samples collected from unaltered and altered areas of the Scarp Lake occurrence.

Representing	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Y
Unaltered (10 samples)	39.1	86.9	10.7	41.4	8.7	1.5	8.9	1.4	8.7	1.8	5.5	0.0	5.5	0.0	46.3
Altered (2 samples)	55.6	119.3	15.2	61.7	**114.1**	**3.0**	**17.3**	**3.0**	**19.0**	**4.1**	**11.7**	**1.8**	**11.6**	**1.8**	**113.2**
Crust	30.0	64.0	7.0	26.0	4.5	0.8	3.8	0.6	3.5	0.8	2.3	0.3	2.2	0.3	22.0
	← LREE →					← HREE →									

Crust is average values of continental crust (Taylor and McLennan 1995)
Bold fonts are values which are at least twice the unaltered value
LREE – light rare earth elements, HREE – heavy rare earth elements
All values are in ppm

The samples collected from the altered portion of the Scarp Lake occurrence returned appreciably higher values of REE than the samples representing the unaltered part of Higbee Lake intrusion. These alteration zone samples also returned at least twice the HREE values compared to unaltered rocks.

Significantly, all samples collected from the Higbee Lake felsic intrusion during this visit returned higher values than the average continental crust values (Talyor and McLennan 1995). Beakhouse (2009) also examined the Higbee Lake felsic body and noted "this intrusion likely has affinity with synvolcanic TTG suites. More speculatively, the higher siliceous character (inferred from presence of quartz phenocrysts) and ytterbium enrichment in lake sediments suggest a possible low-aluminum TTG affinity".

The hydrothermal alteration zone associated with the Scarp Lake occurrence contains elevated REE mineralization, especially the HREE. Notwithstanding the limited number of samples collected from the unaltered parts of the Higbee Lake felsic intrusion, preliminary indications are that this part of the intrusion is also enriched in REE. Based on the results from the lake sediment survey of Felix (2005), the western portion of the Higbee Lake felsic intrusion should be examined for its REE potential.

RECOMMENDATIONS FOR EXPLORATION

Platinum Group Element, Nickel and Copper Prospective Areas in the Kenora District

Platinum group element (PGE) and nickel-copper occurrences are known to occur within ultramafic, mafic and intermediate intrusive rocks in the Kenora District. Historical exploration efforts have targeted the nickel-copper potential but only a limited number of projects have targeted PGE mineralization. Except for programs conducted at the Grassy Portage Intrusion, Entwine Lake Intrusion and the Rex–Werner Lakes area, all other PGE exploration projects have involved only prospecting and sampling. Exploration activity at a majority of the PGE-nickel-copper potential areas is presently dormant. Several intrusions remain open for staking, and historically have not been evaluated for their PGE potential.

The following table provides a general description of the geology and mineralization of the major ultramafic, mafic and intermediate intrusive bodies in the Kenora District. The resource column indicates the most significant PGE-nickel-copper mineralization associated with the bodies. Figure 7, keyed to the Table 13, illustrates the locations of mineral potential areas.

Table 13. PGE-nickel-copper prospective areas in the Kenora District. Locations are illustrated in Figure 7.

Abbreviations

cpy ..... chalcopyrite
Mt ..... million tonnes
pent ..... pentlandite
po ..... pyrrhotite
ppm ..... parts per million
py ..... pyrite

No	Area NTS	Status (Dec 31 2010)	Geology / Mineralization	Resource / Reference
1	Dobie Intrusion 52C/12 NW	Patent, First Nation Reserve and open Crown land	A norite - gabbro intrusion with po, py, pent, cpy mineralization. Sulphides are present in pockets or disseminations.	Young Option, 5 Mt @ 0.28% Cu and 0.24% Ni (Kenora District Office, assessment files 52C/12 NW B-3)
2	Grassy Portage Intrusion 52C/11 NW / NE	Staked	Gabbro - anorthosite rocks in a steeply north-dipping, layered intrusion. Basal segregation of cpy, po and pent noted. The 3.7 metre mineralized zone consists of 8% stringer and disseminated pyrrhotite and chalcopyrite at the contact between mafic volcanics and coarse-grained gabbro.	North Rock Mine – 1.0 Mt @ 1.17% Cu (Poulsen 2000) A 3.4 m interval in diamond drill program returned 12.2 g/t Pt (MetalCORP Ltd., press release, March 6, 2006)
3	Bad Vermilion Lake Intrusion 52C/10 NE	Staked and open Crown land	Layered mafic rocks of the intrusion are composed of equigranular, medium-grained gabbro, leucogabbro and anorthosite, with disseminated magnetite and ilmenite.	Coarse-grained mineralization is located in isolated lenses within massive-textured zones of ilmenite and titaniferous magnetite (Poulsen 2000)
4	Bennett Lake intrusions 52C/16 SE / SW	Open Crown land	Gabbroic rocks that form lobate intrusions of diorite to quartz diorite.	Grab samples of altered anorthosite from Grey Trout Road exposures returned 1.46% Cu, 0.18% Ni, 0.07% Co and 46 ppb Pd (Blackburn and Hinz 1996)
5	Entwine Lake Intrusion 52F/02 NE	Staked	Stone (2000) identified this intrusion as a sanukitoid suite of quartz monzonite to quartz diorite composition. Mineralization is hosted in altered diorite.	Campbell Zone has been traced for 1600 m to a depth of 150 m. DDH ER-23 returned 1.2 g/t Au-Pd-Pt, 4.8 g/t Ag, 0.5% Cu over 30 m. (Champion Bear Resources Ltd., press releases, May 26, 2000 and January 5, 2009)
6	Jackfish - Weller Lakes Pluton 52F/03	Open Crown land and patents	A porphyritic monzonite, syenite to diorite intrusive body that has received no PGE exploration.	Jackfish Lake – grab samples returned 4.8% Cu and 0.96% Co (Blackburn 1976)
7	Caliper Lake Intrusion 52F/04 SW	Open Crown land	Steeply southward-dipping, layered gabbroic intrusion composed of pyroxenite to quartz diorite.	5 grab samples returned 1154-2245 ppm Cr with low Cu and Ni values (<300 ppm) (A. Raoul, OGS, personal communication, 2000)
8	Zone #34 52D/16SE	Staked and patents	Magmatic Ni-Cu-Co-PGE mineralization found in a sub-horizontal, tabular, pyroxenite-gabbro intrusion that cuts the ODM/17 gold zone.	57 000 tonnes @ 457 ppb Pt, 1160 ppb Pd, 7562 ppm Ni, 4714 ppm Cu (Rainy River Resources Ltd., technical report, July 2009)
9	Denmark Lake intrusions 52F/05 NE	Staked	Variable-textured gabbro with remobilized sulphides along shear zones. At Kenbridge, sulphides were remobilized in a breccia pipe conduit and situated in matrix around and as filling within fragmental rocks.	Grab samples Nielson – Gauthier occurrence returned 0.65% Cu and 0.48% Ni over 6 m (Davies 1973) Kenbridge Mine – open pit resource: Measured & Indicated: 4.46 Mt @ 0.42% Ni, 0.23% Cu (Canadian Arrow Mines Ltd., press release, August 19, 2008)

10	Mulcahy Intrusion 52F/11 SW	Staked but majority open Crown land	A layered gabbro in NW border of Atikwa Batholith. The Mulcahy Intrusions can be divided into 3 marginal zones. Chromite bands containing 2% sulphides were noted.	Grab samples from Mulcahy Lake occurrence returned 2190 ppm Cu and 1350 ppm Ni (Sutcliffe and Smith 1985) Samples from Trench 7 returned 870 ppb Pd (Kenora District Office, assessment files 52F/11SW L1 to L-4)
11	Mafic intrusions around the Atikwa Batholith 52F/05	Patents, staked and open Crown land	PGE and Cu-Ni occurrences occur within ultramafic, mafic and intermediate intrusive rocks peripheral to the Atikwa Batholith. These include the Emmons Lake, Nabish, and Mile Lake intrusions.	Grab samples from altered gabbro at Emmons Lake occurrence returned 717 ppm Pt and 1012 ppm Pd. (Hinz and Ravnaas 1998)
12	Boyer Lake Intrusion 52F/07 NE	Open Crown land	Strongly zoned, gabbroic sill composed of gabbro to quartz-eye gabbro. Weak sulphide mineralization has been located at the periphery.	Grab samples collected from leucocratic zone by Massval Mines returned 0.2% Cu over 0.6 m and 12-15% MgO major element oxide. (Blackburn 1981)
13	Pike Lake Intrusion 52G/14 SW/SE	Staked	Composed of variable-textured quartz diorite to diorite with disseminated chalcopyrite. Cu has been the target of past exploration but not PGEs.	Grab samples of altered gabbro returned 2% Cu and 0.5% Ni (Kenora District Office, assessment file, 52G/14SE 0061)
14	Barge Lake intrusions 52G/15 NW	Open Crown land	A number of gabbro to serpentinized peridotite intrusions with disseminated chalcopyrite. There has been no exploration targeting PGE.	
15	Handcuff Lake intrusions 52J/03 NE	Open Crown land	Unexplored variable-textured gabbro, anorthosite gabbro, quartz diorite intrusions.	
16	Marchington Road intrusions 52J/06 SE/SW 52J/07 SW	Open Crown land	Several mafic sills composed of diorite to quartz diorite rocks. These intrusions have not been explored for PGE.	Py and cpy noted in intrusive rocks (Bond 1980)
17	Rex–Werner Lake ultramafic rocks 52L/06 to 52L/07	Staked and patents	Disseminated to massive magmatic Ni - Cu - Co - PGE mineralization associated with ultramafic–mafic lenses and pods. Cu - Co deposits are known in the area.	Rexora – resource: 140 000 tons @ 1.5% Ni and 0.7% Cu Gordon Mine – production: 1.4 Mt @ 0.9% Ni, 0.5% Cu and 0.023 oz Pd Norpax – resource: 1 Mt @ 1.2% Ni and 0.5% Cu (Parker 1998)

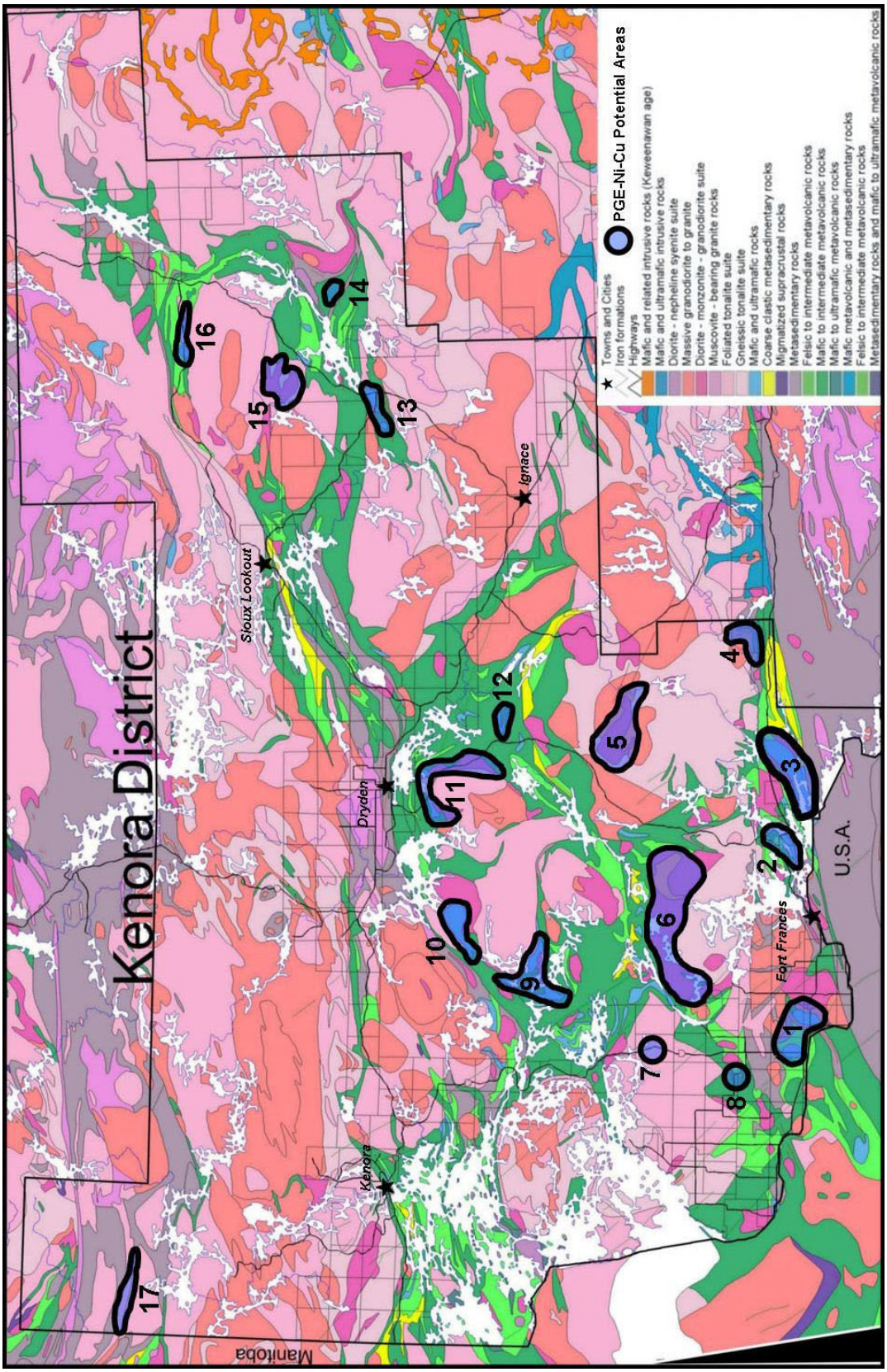


Figure 7. Areas of PGE-nickel-copper potential in the Kenora District (*modified from* OGS 2003). Locations listed in Table 13.

OGS ACTIVITIES AND RESEARCH BY OTHERS

Four Ontario Geological Survey (OGS) field projects were conducted in the Kenora District in 2010. Figure 8 illustrates the location of these projects.

A) Beakhouse, G.P., Precambrian Geoscience Section, OGS, continued the investigation of granitoid rocks in the western Wabigoon Subprovince;

B) Dyer, R.D., Sedimentary Geoscience Section, OGS, completed Werner–Separation Lake area high-density lake sediment and water sampling survey;

C) Lewis, D., Precambrian Geoscience Section, OGS, conducted a study on the geology of the Split Lake area; and

D) Stone, D., Precambrian Geoscience Section, OGS, conducted a study on the geology of the Stormy Lake area.

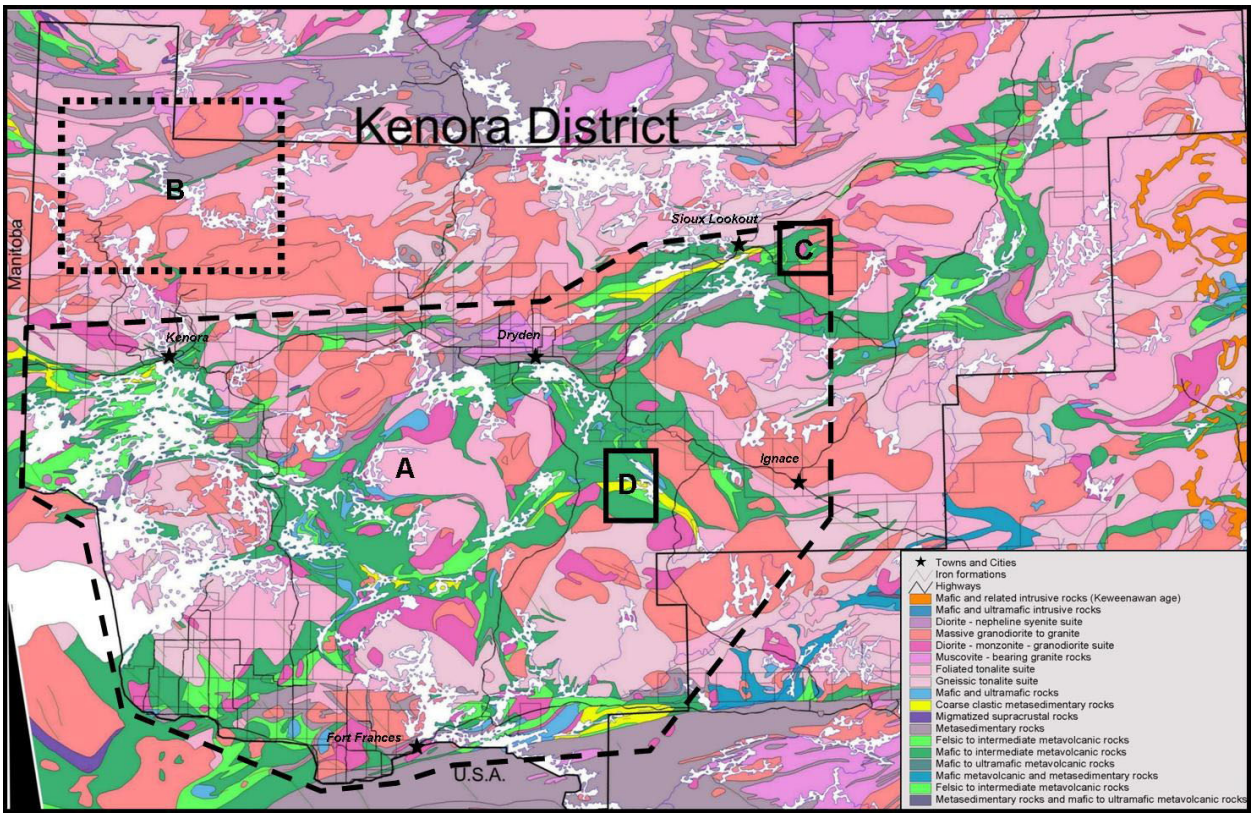


Figure 8. Location of OGS activities conducted in the Kenora District in 2010 (*modified from* OGS 2003).

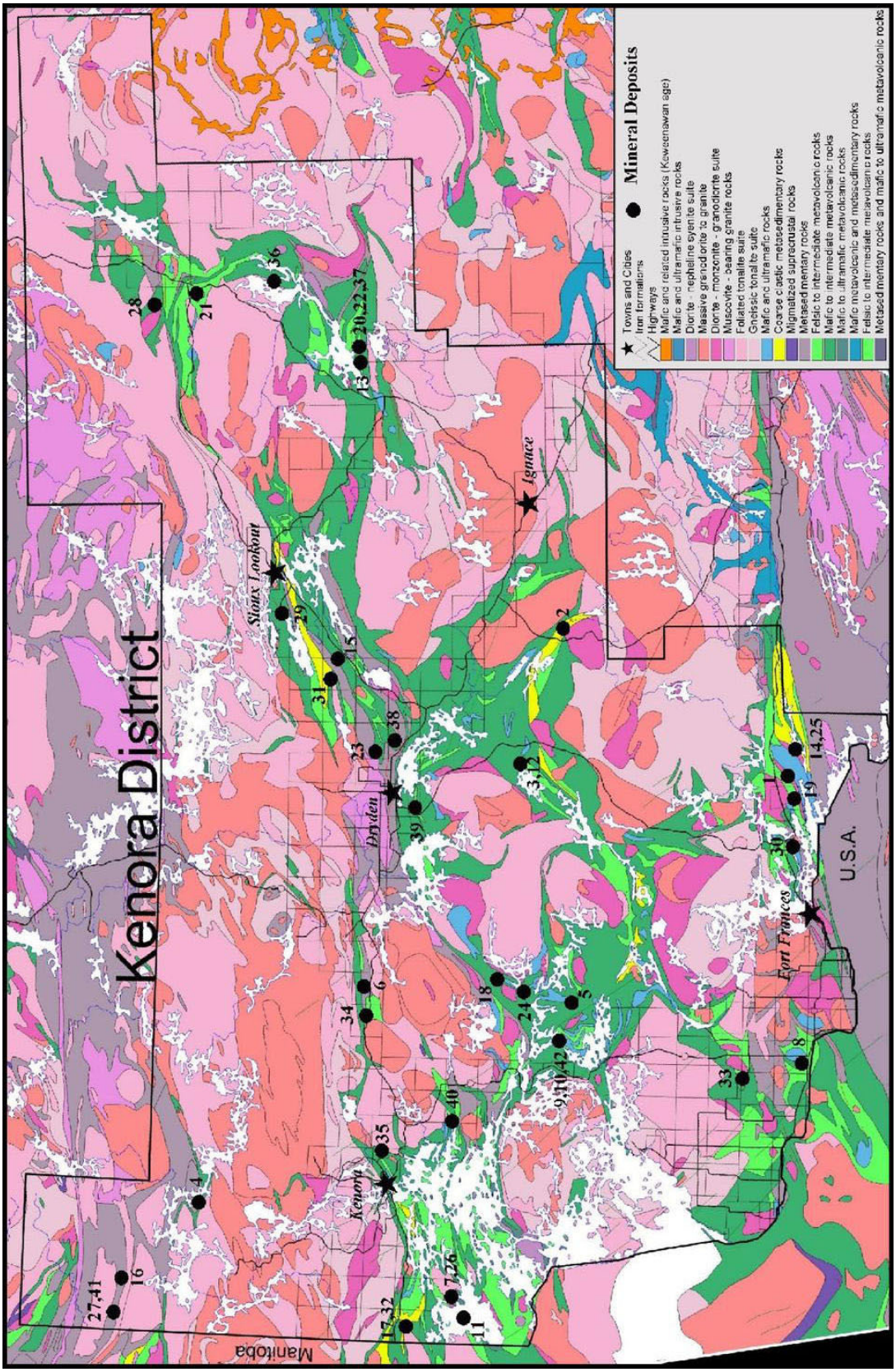


Figure 9. Location of mineral deposits not being mined in the Kenora District (*modified from* OGS 2003).

Table 14. Mineral deposits not being mined in the Kenora District in 2010. Locations are illustrated in Figure 9.

Abbreviations

AF ..... Assessment Files
CMH ..... *Canadian Mines Handbook*
GR ..... Geological Report
MDC ..... Mineral Deposit Circular
MDIR ..... Mineral Deposit Inventory record
RoA ..... Report of Activities
MLS ..... Mining Lands, Sudbury
MR ..... Mining Recorder
NM ..... *The Northern Miner*
OFR ..... Open File Report
PC ..... Personal Communication
SMDR ..... Source Mineral Deposit Record

No.	Deposit Name (NTS – MDI #)	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status (as of Jan. 2011)
1	Bad Vermilion Lake–Seine Bay (52C/10NW - 031)	Fe, Ti, V	Resource: 1.2 Mt at 15% TiO_2 and 45% Fe. Potential for 177 800 t of titanium sponge	NM 08/15/85, p.3 (Beaver Energy Resource)	Active
2	Bending Lake (52F/08SE - 004)	Fe	Recoverable Ore (proposed): 2000 m by 300 m wide with a resource of 247 Mt @ 23% Fe Proposed concentrate of 70% Fe (96–97% magnetite) using magnetic separation	Bending Lake Ore Corporation, personal communication, 2006	Active
3	Big Master (52F/07NE - 002)	Au, Ag	Production: 2565 oz Au and 184 oz Ag from 14 470 tons Based on 1967 drilling: 30 000 tons @ 0.36 opt Au Old workings: 19 000 tons @ 0.30 opt Au Resource (proven and probable): 123 000 tons @ 0.30 opt Au	MDC 16, p.9 CMH, 1988–1989, p.92 (Canamerica Precious Metals Inc.)	Active
4	Big Whopper (52L/07SE - 030)	Li, Cs, Rb, Ta	Preliminary resource estimated @ 11.6 Mt averaging 1.34% Li_2O and 0.30% Rb_2O	CMH, 2000–2001, p.45 (Avalon Ventures Ltd.)	Active
5	Cameron Lake (52F/05SE - 008)	Au	Indicated: 4.164 Mt @ 3.16 g/t Au Inferred: 7.148 Mt @ 2.54 g/t Au Total: 11.312 Mt @ 2.77 g/t Au	Coventry Resources, press release, April 21 2010	Active
6	Cates (52F/13SE - 065)	Zn, Ag	Zone: 2700 m by 12 m by 60 m Reserves: 5.83 Mt @ 0.5% Zn and 0.5 opt Ag	AF 52F/13SE M-1 to M-6 (Noranda) AF 52F/13SE B-1 to B-6 (Rio Algom)	Active
7	Cedar Island Extension (52E/10SW - 017)	Au	Indicated: 1 Mt @ 4.18 g/t Au Inferred: 3.050 Mt @ 3.25 g/t Au (Mineral resource estimate cut-off grade 1.0 g/t Au)	Everton Resources Inc., press release, February 4, 2010	Active
8	Dobie (52C/12NW - 011)	Cu-Ni	Resource: 5.0 Mt @ 0.28% Cu and 0.24% Ni	AF 52C/12NW B-3	Inactive
9	Dogpaw No.1 (52F/05SW - 012)	Au	Resource for Dogpaw No.1 vein: 59 239 tons @ 0.45 opt Au	Houston Lake Mining Inc., press release, December 9, 2008	Active
10	Dubenski (52F/05SW - 013)	Au	Resource for Shaft Zone Indicated: 551 000 t @ 3.53 g/t Au Inferred: 22 000 t @ 2.57 g/t Au	Houston Lake Mining Inc., press release, November 5, 2009	Active

No.	Deposit Name (NTS – MDI #)	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status (as of Jan. 2011)
11	Duport (52E/11SE - 002)	Au	Production: 4672 oz Au, 1143 oz Ag from 1287 tons Indicated: 424 000 t @ 13.4 g/t Au Inferred: 387 000 t @ 10.7 g/t Au	MDC 16, p.11 Halo Resources Ltd., press release, August 19, 2005	Active
12	Elora (52F/07NE - 015)	Au	Production: 1370 oz Au and 296 oz Ag from 13 766 tons Resource: Probable: 228 500 tons @ 0.18 opt Au Estimated: 5000 tons @ 0.10 opt Au	MDC 16, p.15 OFR 5332, p.37, Table 8	Active
13	F-Group (52G/14SE - 004)	Cu, Zn, Pb, Ag	Original Reserves (Dec. 1978): 630 000 t @ 8.10% Zn, 0.98% Cu, 0.49% Pb, 1.80 opt Ag Reserves (Dec. 1982): 200 000 t @ 8.20% Zn, 0.80% Cu, 0.60% Pb, 1.80 opt Ag	CMH 1979–1980, p.194 (Noranda) CMH 1982–1983, p.254 (Noranda)	Inactive - Rehabilitated
14	Foley Mine (52C/10NE - 032)	Au	Production: 855 oz Au, 149 oz Ag from 568 tons Reserves: 40 000 t @ 0.5 opt Au proven / probable and 400 000 t @ 0.5 opt Au inferred	MDC 16, p.16 NM September 25, 1980 (Seaforth Mines Ltd.); OFR 5539, p.194	Active
15	Goldlund (52F/16NW - 004)	Au	Production: 111 891 t @ 0.15 opt Au (Dec. 1984) Reserves: 39.6 Mt @ 1.21 g/t Au that can be mined by open pit	AF 52F/16NW 081 Tamaka Gold Corp., technical report April 20, 2009	Active
16	Gordon Lake (52L/07NW - 004)	Cu, Ni, PGE	Production: 1.6 Mt @ 0.78% Ni, 0.41% Cu and 0.026 opt Pd (Dec. 1971) Reserves (1971): 170 420 tons @ 0.85% Ni and 0.35% Cu	OFR 5975, p.121	Inactive - Rehabilitated
17	High Lake–Evenlode (52E/11NE - 061)	Mo, Au	Resource: 200 000 t @ 0.63% MoS_2, possible 550 000 t estimated to a depth of 145 m	OFR 5695, p.114	Inactive
18	Kenbridge (52F/05NE - 047)	Ni, Cu	Above 150 m level – Open Pit proposed Measured & Indicated: 4.46 Mt @ 0.42% Ni, 0.23% Cu Below 150 m level – Underground proposed Measured: 206 000 t @ 0.85% Ni, 0.43% Cu Indicated: 2 469 000 t @ 0.97% Ni, 0.51% Cu Inferred: 118 000 t @ 1.38% Ni, 0.88% Cu	Canadian Arrow Mines Limited, press release, August 19, 2008	Active
19	Lockhart Lake (52C/10NW - 033)	Zn, Cu, Au, Ag	Resource: 6.1 Mt @ 1.06% Zn, 0.27% Cu, 3.2 g/t Ag, 0.006 g/t Au	AF 52C/10NE Y-6 (Minnova 1989)	Inactive

No.	Deposit Name (NTS – MDI #)	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status (as of Jan. 2011)
20	Lyon Lake – Creek Zone (52G/15NW - 007)	Cu, Zn, Pb, Ag	Original Reserves: 3.945 Mt @ 6.53% Zn, 1.24% Cu, 0.63% Pb, 3.42 opt Ag and 0.01 opt Au Reserves: 0.695 Mt of 10.34% Zn, 0.75% Cu, 1.62% Pb and 5.96 opt Ag	CMH 1979–1980, p.194 (Noranda) CMH 1990–1991, p.332 (Noranda)	Inactive - Rehabilitated
21	Marchington Road (52J/07SE - 016)	Cu, Zn, Pb, Ag	Resource: 150 000 tons @ 0.98% Cu, 3.11% Zn, 1.16% Pb, 1.97 opt Ag	Umex Inc. AF 52J/7SW 0024	Inactive
22	Mattabi (52G/15SW - 002)	Cu, Zn, Pb, Ag	Original Reserves: 13.66 Mt @ 7.50% Zn, 0.80% Cu, 0.77% Pb and 3.10 opt Ag Reserves: 0.387 Mt of 0.13% Cu, 9.28% Zn, 0.58% Pb and 1.77 opt Ag	GR 221, p.4 CMH 1988–1989, p.338 (Noranda)	Inactive - Rehabilitated
23	Mavis Lake (52F/15SE - 038)	Li, Ta	Resource: 500 000 tons of 1% LiO_2	OFR 5718, p.151	Active
24	Maybrun (52F/05NE - 008)	Cu, Au	Production: 125 000 t at unknown grades (Aug. 1973 to Dec. 1974) Resource for the Maybrun Zones: Main Indicated: 7 366 000 t @ 0.41% Cu, 0.64 g/t Au Main Inferred: 1 738 000 t @ 0.30% Cu, 0.115 g/t Au Footwall Inferred: 5 400 000 t @ 0.18% Cu, 0.94 g/t Au North Inferred: 3 454 000 t @ 0.25% Cu, 0.67 g/t Au	MDIR K0203 Opawica Explorations Inc., press release, July 16, 2009	Active
25	McKenzie-Gray (52C10NE - 050)	Au	Resource: 98 701 tons @ 0.30 opt Au	Nipigon Resources Inc. AF 52C10NE DDD-4 (Larouche 1992)	Active
26	Mikado (52E/10SW - 016)	Au	Indicated: 968 300 t @ 4.18 g/t Au Inferred: 3 014 000 t @ 3.25 g/t Au Cutoff: 1 g/t Au	Everton Resources Inc. press release, March 1, 2010	Active
27	Norpax (52L/06NE - 016)	Ni, Cu	2002 drilling intersected 3.35 m of 1.308 g/t PGE and 2.94% Cu, Ni Resource: 1 Mt @ 1.2% Ni, 0.5% Cu	Atikwa Minerals Ltd., press release, August 28, 2003 Norpax Nickel Mines Ltd., AF	Active
28	North Kaskaweogama (52J/07NW - 016)	Fe	Resource: 405 000 tons at 28% Fe in 4 zones and a possible 50 Mt at unstated grade	MDC 11, p.443	Active
29	North Pines (52K/01SE - 005)	Pyrite	Production: 500 000 t at 28% Fe (1909–1921)	GR 101, p.36	Inactive
30	North Rock (52C/11NE - 029)	Cu	Zone: 400 m x 30 m x 91 m Resource: 1.02 Mt @ 1.17 % Cu including 265 230 tons @ 2.08% Cu	OFR 5512, p.50	Active
31	Pidgeon Molybdenum (52F/16NW - 029)	Mo	Resource: 8.5 Mt @ 0.099% Mo	MPH Ventures Ltd., news release, December 27, 2007	Active

No.	Deposit Name (NTS – MDI #)	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status (as of Jan. 2011)
32	Purdex A-D (52E/11NE - 017)	Au	Resource: 226 800 t grading between 8.57 and 10.28 g/t Au	International Millennium 2006 technical report	Active
33	Rainy River Zones 17, 34 (52D/16SE - 004)	Au, PGE, Cu, Ni	Resource at 17, ODM, 433 and Cap zones: Indicated: 56 833 000 t @ 1.30 g/t Au, 1.81 g/t Ag Inferred: 68 930 000 t @ 1.20 g/t Au, 2.73 g/t Ag	Rainy River Resources Ltd., news release, March 2, 2010	Active
			34 Nickel Zone: Resource: 57 000 t @ 1.4 g/t Au, 457 ppb Pt, 1160 ppb Pd, 7562 ppm Ni, 4714 ppm Cu	Rainy River Resources Ltd., technical report, July 10, 2009	
34	Richard Lake (52F/13SW - 004)	U	Zone: 213 m x 3 m x 300 m Resource: 650 000 tons of 0.10% U_3O_8	GR 130, p.46	Active
35	Scramble (52E/16SW - 072)	Au	Zone: 366 m to 457 m by 3.7 m wide zone @ 0.15 opt Au Resource: 150 000 t @ 0.24 opt Au drill estimated 70 000 oz (@ 0.05 opt Au cut-off)	NM 07/25/88 (Madeline Mines Ltd.) CIMM, Dist.4 Field Trip Guidebook, p.44	Inactive
36	St Anthony (52J/02SE - 003)	Au	Production: 331 069 tons @ 0.19 opt Au Resource: 37 800 tons @ 0.18 opt Au	MDC 13, p.295	Active
37	Sturgeon Lake (52G/15NW - 004)	Cu, Zn, Pb, Ag	Original Reserves (Dec. 1974): 2.10 Mt @ 10.64% Zn, 2.98% Cu, 1.47% Pb, 6.14 opt Ag, 0.021 opt Au	GR 221, p.4	Inactive - Rehabilitated
			Reserves (Dec. 1978): 599 000 t @ 2.34% Cu, 8.98% Zn, 1.30% Pb, 5.17 opt Ag, 0.018 opt Au	CMH 1980–1981, p.102 (Falconbridge)	
38	Thunder Lake (52 F/15SE - 053)	Au	Bulk Sampling: 428 oz Au and 1161 oz Ag from 2365 t	Corona Gold, 1999 Annual Report	Active
			Resources for Au zones at deposit (both surface and underground): Indicated: 3.4 Mt @ 2.5 g/t Au Inferred: 10.6 Mt @ 2.7 g/t Au	Resource: Treasury Metals Inc., news release, September 8, 2010	
39	Vanlas (52F/10NW - 032)	Au	Resource: 100 000 t @ 0.20 opt Au	Power Expl. Inc. AF 52F/10NW UU-1	Active

No.	Deposit Name (NTS – MDI #)	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status (as of Jan. 2011)
40	Wendigo (52E/09NE - 003)	Au, Ag, Cu	Produced: 67 423 oz Au, 14 762 oz Ag and 1.89 million lbs of Cu from 20 054 t	SMDR 001350	Inactive
			Vein 1: 110 m x 0.8 m x 230 m depth @ 0.33 opt Au (production vein) Vein 2: 118 m x 0.6 m Vein 3: 180 m x 0.3 m Vein 4: unknown tailings: 61 970 t at 0.027 opt Au	OFR 5695, p.352	
41	Werner Lake Cobalt (52L/07NW - 003)	Co, Cu	Proven Resource: 140 031 t @ 0.47% Co and 0.26% Cu Probable Reserves: 40 829 t @ 0.25% Co and 0.43% Cu	Puget Ventures Inc., press release, April 2, 2009	Active
			Indicated Resource: 51 456 t @ 0.13% Co and 0.20% Cu Inferred Resources: 507 412 t @ 0.31% Co and 0.29% Cu		
			Production: recovered 389 363 lbs of Co (1932, 1940–1944); grades 2% Co and 0.75% Cu	MDC 1, p.37	
42	Angel Hill Zone (52F/05SW - 140)	Au	Angel Hill Zone Inferred Resource: 106 400 t @ 2.97 g/t Au	Houston Lake Mining, news release, October 20, 2005	Active

This table contains tonnage and grade estimates, referred to as "resource" (estimated, possible, proposed), that were determined at various times by methods largely unreported. The values of these resource estimates were calculated prior to the reporting standards required by National Instrument 43-101.

Resources estimate values presented as measured, indicated or inferred are in compliance with the reporting standards required by National Instrument 43-101.

REGIONAL LAND USE GEOLOGIST ACTIVITIES

For the report of the northwest Regional Land Use Geologist, *see* pages 48 to 50 in the Red Lake District report.

MINERAL DEPOSIT COMPILATION GEOLOGIST – NORTHWEST ACTIVITIES

For the report of the northwest Mineral Deposit Compilation Geologist, *see* page 50 in the Red Lake District report.

ACKNOWLEDGMENTS

J. Mason and A. Lichtblau edited this manuscript, and staff of the Publication Services Section prepared it for publication. Prospectors and company personnel are also thanked for their contributions and assistance throughout the year.

REFERENCES

Baker, C.J. 2010. Diamond drill report Off Lake property – Menary Township; Kenora District Geologist's office, assessment file 52C13NW Q-11, AFRO # 2.46236, Rainy River Resources Ltd.

Beakhouse, G.P. 2009. Investigation of granitoid rocks in the Wabigoon Subprovince; *in* Summary of Field Work and Other Activities 2009, Ontario Geological Survey, Open File Report 6240, p.13-1 to 13-6.

Beard, R.C. and Garratt, G.L. 1976. Gold deposits of the Kenora–Fort Frances area, districts of Kenora and Rainy River; Ontario Division of Mines, Mineral Deposit Circular 16, 46p.

Blackburn, C.E. 1976. Geology of the Off–Burditt Lake area, District of Rainy River; Ontario Division of Mines, Geological Report 140, 62p.

Blackburn, C.E. 1978. Geological compilation, Kenora–Fort Frances; Ontario Geological Survey, Map 2243, scale 1:253 440.

Blackburn, C.E. 1981. Geology of the Boyer Lake–Meggisi Lake area, District of Kenora; Ontario Geological Survey, Report 202, 107p.

Blackburn, C.E. and Hinz, P. 1996. Kenora Resident Geologist's District; *in* Report of Activities 1996, Ontario Geological Survey, Open File Report 5958, 33p.

Blackburn, C.E., Hailstone, M.R., Parker, J. and Storey, C.C. 1986. Kenora Resident Geologist Area, Northwestern Region; *in* Report of Activities 1985, Regional and Resident Geologists, Ontario Geological Survey, Miscellaneous Paper 128, p.1-45.

Blackburn, C.E., Hinz, P., Storey, C.C., Kosloski, L. and Ravnaas, C.B. 1999. Report of Activities 1998, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts; Ontario Geological Survey, Open File Report 5987, 88p.

Bond, W.D. 1980. Geology of the Houghton–Hough Lakes area (Savant Lake area), District of Thunder Bay; Ontario Geological Survey, Report 195, 112p.

Cole, G., Couture, J.F. and Dorota, E. 2009. Mineral resource evaluation Rainy River Gold Project; unpublished report, Rainy River Resources Ltd., 135p.

Davies, J.C. 1973. Geology of the Atikwa Lake area, District of Kenora; Ontario Division of Mines, Geological Report 111, 57p.

Davies, J.C. and Smith, P.M. 1988. The geological setting of gold occurrences in the Lake of the Woods area; Ontario Geological Survey, Open File Report 5695, 381p.

Davies, J.C. and Watowitch, S.N. 1955. Geology of the Populus Lake area; map 1956-3 *in* Sixty-Fifth Annual Report of the Ontario Department of Mines, Vol. LXV, Part 4, 1956, p.1-21.

Felix, V.E. 2005. Eagle Lake area high density regional lake sediment and water geochemical survey; Ontario Geological Survey, Open File Report 6104, 79p.

Ferguson, S.A., Groen, H.A. and Haynes, R. 1971. Gold deposits of Ontario: Part I, districts of Algoma, Cochrane, Kenora, Rainy River and Thunder Bay; Ontario Division of Mines, Mineral Resources Circular 13, 315p.

Hinz, P. and Ravnaas, C. 1998. Kenora Resident Geologist's District; *in* Report of Activities 1999, Ontario Geological Survey, Open File Report 5987, 31p.

Hinz, P., Ravnaas, C. and Raoul, A. 2005. Report of Activities 2004, Resident Geologist Program, Red Lake Regional Geologist Report: Kenora District; *in* Report of Activities 2004, Resident Geologist Program, Red Lake Regional Geologist Report: Red Lake and Kenora Districts, Ontario Geological Survey, Open File Report 6146, 37p.

Johnston, F.J. 1972. Geology of the Vermilion–Abram lakes area, District of Kenora; Ontario Division of Mines, Geological Report 101, 51p.

Laakso, R., O'Flaherty, M. and O'Flaherty, K. 2010. Technical report preliminary scoping study on the Atikwa Lake (Maybrun Mine) gold and copper property; unpublished report, Opawica Exploration Inc., 172p.

Larouche, C. 1992. Assessment report on the McKenzie-Gray Gold Property; Kenora District Geologist's office, assessment file 52C10NE DDD-4, Nipigon Gold Resources Inc., 89p.

Neilson, J.N. and Bray, R.C.E. 1981. Feasibility of small scale gold mining in northwestern Ontario (parts of the districts of Kenora, Rainy River and southwestern Thunder Bay); Ontario Geological Survey, Open File Report 5332, Volume 1–Text, 132p.

Ontario Geological Survey 2003. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release—Data 126.

Parker, J.R. 1998. Geology of nickel-copper-chromite deposits and cobalt-copper deposits at Werner–Rex–Bug lakes, English River Subprovince, northwestern Ontario; Ontario Geological Survey, Open File Report 5975, 178p.

Parr, M. and Kuehnbaum, R. 1990. The Scramble Mine gold deposit; Field Trip No.2; *in* Canadian Institute Mining, Metallurgy and Petroleum, Exploration and Mining Geology, 14th Annual Meeting, p.41-65.

Pell, J. 1996. Mineral deposits associated with carbonatites and related alkaline igneous rocks; *in* Undersaturated Igneous Rocks: Mineralogy, Petrogenesis and Economic Potential, Mineralogical Association of Canada, Short Course 24, p.271-310.

Poulsen, K.H. 1984. The geological setting of mineralization in the Mine Centre–Fort Frances area, District of Rainy River; Ontario Geological Survey, Open File Report 5512, 50p.

Poulsen, K.H. 2000. Geological setting of mineralization in the Mine Centre–Fort Frances area; Ontario Geological Survey, Mineral Deposits Circular 29, 78p.

Pryslak, A.P. 1976. Geology of the Bruin Lake–Edison Lake area, District of Kenora; Ontario Division of Mines, Geological Report 130, 61p.

Ravnaas, C. and Bongfeldt, J. 2009. Red Lake Regional Resident Geologist (Kenora District)–2008; *in* Report of Activities 2008, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts, Ontario Geological Survey, Open File Report 6232, p.1-36.

Roy, W.D., Hannon, P.A., Thornton, E.W. and Trinder, I.D. 2010. Independent technical report and preliminary economic assessment on the Goliath Gold Project; unpublished report, Treasury Metals Inc., 417p.

Schnieders, B.R. and Dutka, R.J. 1985. Property visits and reports of the Atikokan Economic Geologist, 1979-1983; Ontario Geological Survey, Open File Report 5539, 512p.

Shklanka, R. 1968. Iron deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular 11, 489p.

Stone, D. 2000. Geology, mineral chemistry and thermobarometry of the Entwine Lake Stock, northwestern Ontario: base metal, platinum group element and gold mineralization; Ontario Geological Survey, Open File Report 6021, 8p.

Stone, D. and Davis, D.W. 2006. Revised tectonic domains of the south-central Wabigoon Subprovince; *in* Summary of Field Work and Other Activities 2006, Ontario Geological Survey, Open File Report 6192, p.11-1 to 11-18.

Storey, C.C. 1990. An evaluation of the industrial mineral potential of parts of the districts of Kenora and Rainy River; Ontario Geological Survey, Open File Report 5718, 259p.

Sutcliffe, R.H. and Smith, A.R. 1985. Precambrian geology of the Mulchay Gabbro, District of Kenora; Ontario Geological Survey, Preliminary Map P.2826, scale 1: 15 840.

Taylor, S.M. and McClennan, S.M. 1995. The geochemical evolution of continental crust; *in* Review of Geophysics, No. 33, part 2, American Geophysical Union, Oxford, England, p.241-265.

Thomson, J.E., Carlson, H.D., Ferguson, S.A., Pye, E.G. and Savage, W.S. 1954. Copper, nickel, lead and zinc deposits in Ontario; Ontario Division of Mines, Mineral Deposit Circular 1, 68p.

Trowell, N.F. 1983. Geology of the Sturgeon Lake area, districts of Thunder Bay and Kenora; Ontario Geological Survey, Geological Report 221, 97p.

Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.

ISSN 1484-9445 [print]
ISBN 978-1-4435-6291-1 [print]

ISSN 1916-615X [online]
ISBN 978-1-4435-6292-8 [PDF]