



**Ontario Geological Survey  
Open File Report 5969**

**Report of Activities, 1997  
Resident Geologist Program**

**Red Lake Regional Resident  
Geologist's Report:  
Red Lake–Kenora Districts**

**1998**





ONTARIO GEOLOGICAL SURVEY

Open File Report 5969

Report of Activities, 1997  
Resident Geologist Program

Red Lake Regional Resident Geologist's Report:  
Red Lake–Kenora Districts

by

C.E. Blackburn, P. Hinz, C.C. Storey, L. Kosloski, and C.B. Ravnaas

1998

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# ONTARIO GEOLOGICAL SURVEY

## RESIDENT GEOLOGIST PROGRAM – 1997

### RED LAKE REGIONAL RESIDENT GEOLOGIST'S DISTRICT

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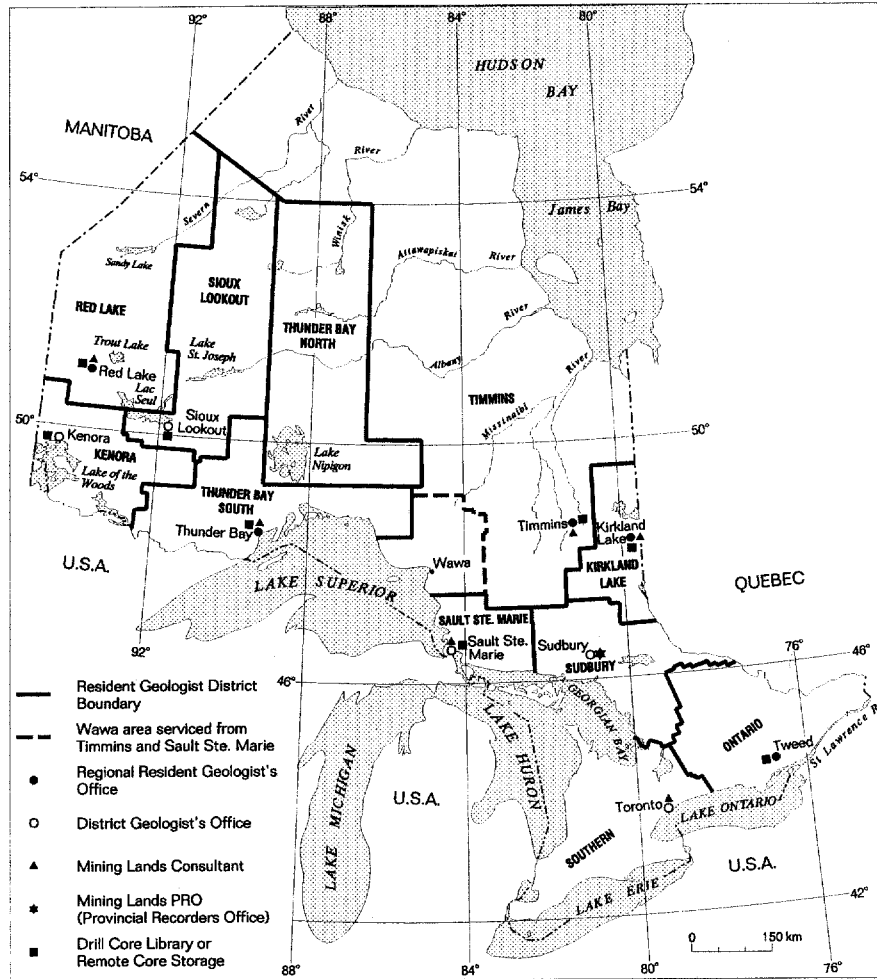
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**ONTARIO GEOLOGICAL SURVEY  
Resident Geologist Program - 1997**

**Red Lake Resident Geologist's District  
by**

**Blackburn, C.E., Storey, C.C., Kosloski, L.**

**1998**





# Red Lake District-1997

Blackburn, C.E.<sup>1</sup>, Storey, C.C.<sup>2</sup> and Kosloski, L.<sup>3</sup>

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## Introduction

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Production of gold continued in 1997, but at a lower overall level than in previous years. Placer Dome America's Campbell mine produced a record 325 044 ounces, but no gold was produced at Goldcorp Inc's Red Lake mine, due to the continuing strike situation. Production commenced at the Madsen Gold Corp's reactivated Madsen mine in June.

Claim staking, measured by units recorded (Table 1), showed a marked decrease compared with 1996, which was a near record year for the District. Many units staked in 1996 were cancelled. However, the number of active claim units remained high, and this is reflected in the large number of exploration programs in the District in 1997. The Red Lake and Birch-Confederation-Uchi lakes greenstone belts were the focus of this work, and large parts of those belts are either staked or held under patent or lease. One project, indicated in Table 3, was conducted with the financial assistance of the Ontario Prospectors Assistance Program (OPAP), using 2 grants totalling \$19,101.

Staff of the Red Lake Resident Geologist's Office made 24 visits to active and inactive mineral properties. These visits result in discussion of 4 properties in this report, all of which were available for option or other deals at time of writing. Two of the 4 properties benefited from financial assistance under the Ontario Prospectors Assistance Program (OPAP). A recommendation is made for prospecting or exploration for rare metals, a commodity that has received little attention in the District.

**Table 1.** Summary of claims recorded and assessment work credit in the Red Lake District in 1997

| Year | Claims Units Recorded | Claims Units Cancelled | Claims Units Active | Diamond Drilling (\$) | Physical Work (\$) | Geotechnical * Work (\$) | Total (\$) |
|------|-----------------------|------------------------|---------------------|-----------------------|--------------------|--------------------------|------------|
| 1997 | 748                   | 1 158                  | 13 753              | N/A**                 | N/A                | N/A                      | N/A        |
| 1996 | 5 845                 | 554                    | 14 163              | 2 630 983             | 1 950              | 629 256                  | 3 277 788  |
| 1995 | 1 759                 | 885                    | 8 872               | 1 171 787             | -                  | 779 734                  | 1 963 234  |
| 1994 | 958                   | 1 544                  | 7 947               | 1 084 900             | -                  | 374 673                  | 1 580 689  |
| 1993 | 787                   | 1 086                  | 8 355               | 811 336               | -                  | 616 330                  | 1 489 392  |
| 1992 | 763                   | 766                    | 7 038               | 667 486               | -                  | 528 825                  | 1 350 363  |

\* As of 1992, Geological and Geophysical Survey data are combined as Geotechnical Work

\*\* N/A = not available at time of writing

# Mining Activity

Gold remains the only commodity mined in the Red Lake District (Table 2). Three mines in the Red Lake camp are currently in production or are carrying out underground exploration and development.

**Table 2.** Mine production and reserves in the Red Lake District in 1997.

| Mine                                    | Production to end of 1996                   |                  | Production in 1997                    |                 | Reserves, 1997     |                        |
|---|---|------------------|---------------------------------------|-----------------|--------------------|------------------------|
|   | Tonnage @ Grade                             | Total Commodity  | Tonnage @ Grade                       | Total Commodity | Tonnage            | Grade                  |
| Placer Dome North America Campbell Mine | 15 173 178 tons @ 0.596 ounce Au per ton    | 9 036 481 ounces | 585 680 tons @ 0.555 ounce Au per ton | 325 044 ounces  | 4 568 000 tons (1) | 0.48 ounce Au per ton  |
| Goldcorp Inc. Red Lake Mine             | 8 298 242 tons @ 0.379 ounce Au per ton     | 3 148 203 ounces | none                                  | none            | 3 392 050 tons (2) | 0.54 ounce Au per ton  |
| Madsen Gold Corp. Madsen Mine           | 8 371 631 tons @ 0.289 ounce Au per ton (4) | 2 416 609 ounces | 66 993 tons @ 0.125 ounce Au per ton  | 8350 ounces     | 1 200 000 tons (3) | 0.271 ounce Au per ton |

(1) Proven and probable reserves at beginning of 1997  
(2) 1996 reserves only  
(3) Company press release, September 17 1997  
(4) Production to 1976 – no production 1976 to 1996

## PLACER DOME NORTH AMERICA – CAMPBELL MINE

During 1997, the Campbell Mine produced a record 325 044 ounces of gold from 585 680 tons of ore milled (personal communication, Marvin Nelson, Placer Dome North America Campbell Mine, 1998) with an average head grade of 0.584 ounce gold per ton. After milling the grade averaged 0.555 ounce Au per ton. The daily milling rate was 1605 tons with an average gold recovery of 94.98%. Diamond drilling included 47 170 m of exploration drilling and 50 321 m of ore definition drilling. Mining operations included 2529 m of new drifts and 1220 m of new raises. Sinking of the Reid Shaft, the new second shaft, reached 968 m by year end. The mine employs 380 people and M. Winship is the mine manager.

## GOLDCORP INC. – RED LAKE MINE

The unionized employees of the Red Lake mine remained on strike all through 1997 and no ore was mined or milled. The underground exploration program continued using salaried employees and contractors. New gold-bearing zones were delineated by underground diamond drilling. A total of 291 003 feet (88 697.7 m) was drilled underground and 9852 feet was drilled from surface (personal communication, Steve McGibbon, Goldcorp Inc, 1998). 4627 feet of new drifts and crosscuts were developed. S. Rusk is the interim mine manager.

## MADSEN GOLD CORP. – MADSEN MINE

The Madsen Mine reopened in June of 1997. During the year 8350.40 ounces of gold were produced from a total of 66 993 tons of ore milled with an average grade of 0.125 ounce Au per ton (personal communication, Mike Leitch, Madsen Gold Corp., 1998). This included 58 546 tons from the Madsen Mine and 8347 tons from other sources, including cleanup of ore and materials from the mine site. The Madsen ore includes 40 380 tons from pre-production development, 10 706 tons from shrinkage stopes and 7460 tons from longhole stopes. Diamond drilling included 10 911.8 m (35 800

feet) of delineation drilling. Mining operations included 999.5 m of level development, 987.3 m of sublevel development and 310.3 m of raise development. The mine employs 85 people and B. Paryniuk is the project manager.

**Table 3.** Assessment files received in the Red Lake District in 1997.

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

| <b>Township or Area</b>     | <b>Company Name</b>  | <b>Year</b> | <b>Type of Work</b>             | <b>AFRO Number (Report of Work Number)*</b> |
|-----------------------------|--|-------------|---------------------------------|---|
| Baird Township              | Canadian Mining International Ltd.(English/Tetlock Option) | 1997        | GM, VLFEM, Lc                   | 2.17516 (214-97)                            |
| Baird Township              | Madsen Gold Corp.  | 1996        | GM, VLFEM, Lc                   | 2.17076 (4-97)                              |
| Baird and Fairlie townships | Placer Dome (CLA) Ltd. (Humlin-Redruth Options)            | 1995        | GL, Pr, GC, Assays, Lithgeochem | 2.17080 (18-97)                             |
| Ball Township               | Battle Mountain Canada Ltd. (Pipestone Narrows Option)     | 1995-1996   | GL, GM, IP, Lc, Samp, Assays    | 2.17105 (19-97)                             |
| Ball Township               | Hemlo Gold Mines Inc. (Shane Resources Option)             | 1996        | GL, Samp, Assays                | 2.17277 (121-97)                            |
| Ball Township               | Hemlo Gold Mines Inc. (Shane Option)                       | 1996        | GM, IP, RES, Lc                 | 2.16880 (124-96)                            |
| Ball Township               | Maciejewski, Antony J.                                     | 1997        | Samp, Str                       | 2.17640 (221-97)                            |
| Ball Township               | Redbrid Gold Corp. (Bridget Lake Property)                 | 1996        | GL, Lc, Samp, Assays            | 2.17313 (49-97)                             |
| Ball Township               | Redbird Gold Corp. (Pipestone Narrows Property)            | 1996        | GM, HLEM, Lc                    | 2.17863 (308-97)                            |

**Table 3.** cont'd. Assessment files received in the Red Lake District in 1997.

| Township or Area   | Company Name   | Year      | Type of Work  | AFRO Number<br>(Report of Work<br>Number)*       |
|--|--|-----------|---|--|
| Balmer Township  | Goldcorp Inc.  | 1996      | DDH(1)=250M, Assays   | 2.17413<br>(130-97)                              |
| Balmer Township  | Green, John  | 1996      | IP, Lc  | 2.16804<br>(121-96)                              |
| Bateman Township   | English, P.  | 1997      | GM, Lc  | 2.17289<br>(42-97)                               |
| Bateman Township   | Placer Dome (CLA) Ltd.<br>(Beatrice Peninsula)                     | 1996      | GM, Lc  | 2.17337<br>(50-97)                               |
| Bateman Township   | Placer Dome (CLA) Ltd.<br>(East Bay)                               | 1996      | DDH(3)=701.345M, Assays   | 2.17335<br>(52-97)                               |
| Bateman Township   | Placer Dome (CLA) Ltd.<br>(East Bay)                               | 1997      | DDH(1)=617', Assays   | 2.17311<br>(118-97)                              |
| Bateman Township   | Placer Dome (CLA) Ltd.   | 1997      | DDH(1)=1087', Assays  | 2.17334<br>(119-97)                              |
| Bateman Township   | Rivard, O.   | 1996      | DDH(1)=231', (Extending<br>hole)  | 2.17108<br>(20-97)                               |
| Bateman Township and<br>Blackbear Lake Area                          | Murgor Resources Inc.  | 1997      | GM, Lc  | 2.17823<br>(237-97)                              |
| Belanger Township  | Noranda Mining & Explo-<br>ration Inc. (Copperlode<br>Property)    | 1995      | DDH(16)=8214.2M, Litho-<br>geochem, Assays                                | 2.17097<br>(7-97)                                |
| Belanger Township  | Noranda Mining & Explo-<br>ration Inc. (Fredart East<br>Property)  | 1997      | DDH(2)=541M, Borehole<br>PEM, Lithochem                                   | 2.17252<br>(41-97)                               |
| Belanger, Bowerman<br>and Mitchell townships                         | Noranda Mining & Explo-<br>ration Inc.                             | 1995-1996 | DDH(4)=1569.4M, GL, Bore-<br>hole PEM, Lithochem                          | 2.16898<br>(127-97, 128-96,<br>130-96 to 132-96) |
| Belanger Township and<br>Little Bear Lake and<br>Knott Township Area | Canadian Zeolite Ltd. (En-<br>glish/Williamson Option)             | 1996      | GM, IP, Lc, VLFEM   | 2.17095<br>(8-97)                                |
| Blackbear Lake Area  | Sergeant, D.   | 1995      | GM, VLFEM, Beep, Lc, Pr,<br>Samp, Assays                                  | OP95-312   |
| Blackbear Lake Area  | Sergeant, D.   | 1995      | GM, VLFEM, Lc   | 2.17121<br>(11-97)                               |
| Casummit Lake Area   | Santa Fe Canadian Mining<br>Ltd./Gold Canyon Re-<br>sources Inc.   | 1996      | DDH(61)=40,651', GL, Litho-<br>geochem                                    | 2.16974<br>(162-96)                              |
| Corless and Dent town-<br>ships                                      | Buckner, J.  | 1997      | GL, Lc  | 2.17386<br>(123-97)                              |
| Dent Township  | Huston, C. (Huston/En-<br>glish Property)                          | 1995      | GM, VLFEM, Lc   | OP95-378   |
| Dent Township  | Inmet Mining Corporation   | 1995-1996 | DDH(6)=4005.61M, Borehole<br>PEM, Lithochem, Assays                       | 2.17307<br>(45-97 to 48-97)                      |
| Dent and Mitchell town-<br>ships                                     | Campbell, G./ Hawke, D.  | 1996      | Pr, Samp, Assays  | 2.17231<br>(44-97)                               |
| Dixie Lake Area  | Canadian Golden Dragon<br>Resources Ltd.                           | 1996-1997 | DDH(26)=4358.7M, Litho-<br>geochem, Assays                                | 2.17546<br>(213-97)                              |
| Dome Township  | Freewest Resources Cana-<br>da Inc. (McCuaig Red<br>Lake Property) | 1995-1996 | DDH(9)=3380', GM, Soil GC,<br>IP, VLFEM, Lc, Pr, Tr, Str,<br>Samp, Assays | 2.17421<br>(171-97)                              |
| Dome Township  | Freewest Resources Cana-<br>da Inc.                                | 1996      | IP, RES   | 2.17420<br>(170-97)                              |

**Table 3.** cont'd. Assessment files received in the Red Lake District in 1997.

| <b>Township or Area</b>           | <b>Company Name</b>  | <b>Year</b> | <b>Type of Work</b>                                  | <b>AFRO Number<br/>(Report of Work<br/>Number)*</b>    |
|-----------------------------------|--|-------------|--|--|
| Dome Township                     | Maple Minerals Inc.  | 1997        | GM, IP, VLFEM, Lc                                    | 2.17573<br>(215-79)                                    |
| Dome Township                     | Noramco Mining Corporation (Bonanza Option)                                  | 1987-1988   | DDH Locations and assay compilation                  | Non-Assessment   |
| Dome Township                     | Peterson, C.W.   | 1995        | Str, Samp, Assays                                    | OP95-071   |
| Dome Township                     | Rubicon Minerals Corporation (Red Lake Property)                             | 1996        | Samp, Assays, Relogging drill core, Lithogeochem     | 2.17233<br>(37-97)                                     |
| Dome Township                     | Rubicon Minerals Corporation (Meunier Option)                                | 1996        | GL, Tr, Samp, Lithogeochem, Assays                   | 2.17096<br>(9-97, 10-97)                               |
| Dome Township                     | Rubicon Minerals Corporation (Red Lake Project)                              | 1997        | GM, Lc   | 2.17290<br>(38-97, 39-97)                              |
| Fairlie Township                  | Wolfden Resources Inc. (Martin Bay Project)                                  | 1997        | GM   | 2.17419<br>(169-97)                                    |
| Fredart Lake Area                 | Noranda Mining & Exploration Inc. (Sandy Pines Option)                       | 1996        | GL, GM, HLEM, Deep-EM, Lc, Samp, Lithogeochem        | 2.16881<br>(125-96, 126-96)                            |
| Gerry Lake Area                   | Campbell, G./ Hawke, D.  | 1997        | Pr, Lc   | 2.17829<br>(241-97)                                    |
| Gerry Lake Area                   | Noranda Mining & Exploration Inc. (Joy Property)                             | 1995        | DDH(4)=1586M, Borehole and Surface PEM, Lithogeochem | 2.17026<br>(1-97, 2-97)                                |
| Gerry Lake Area                   | Noranda Mining & Exploration Inc. (Ben Lake Project)                         | 1996        | DDH(8)=3030M, Lithogeochem, Assays                   | 2.17414<br>(131-97)                                    |
| Gerry Lake Area                   | Pathfinder Resources Ltd. (Noranda Mining & Exploration Inc. - Joy Property) | 1995        | DDH(4)=1586M, Borehole and Surface PEM, Lithogeochem | OM95-004<br>(Same information as in 2.17026 - Noranda) |
| Hammell Lake (Todd Township) Area | Battle Mountain Canada Ltd. (Sadler Bay)                                     | 1996        | GL   | 2.17343<br>(120-97)                                    |
| Hammell Lake (Todd Township) Area | Goldcorp Inc.  | 1997        | DDH(2)=904M, Assays                                  | 2.17828<br>(244-97)                                    |
| Hammell Lake (Todd Township) Area | Placer Dome (CLA) Ltd. (Golden Tree)   | 1996        | GM, VLFEM, Lc  | 2.17338<br>(51-97)                                     |
| Hammell Lake (Todd Township) Area | Placer Dome (CLA) Ltd.   | 1997        | GL, Samp, Lithogeochem                               | 2.17436<br>(172-97)                                    |
| Heyson Township                   | East West Resource Corporation   | 1996        | DDH(13)=1489.5M, GM, VLFEM, Assays                   | 2.17110<br>(13-97, 14-97)                              |
| Heyson Township                   | Loydex Resources Inc.  | 1995        | Rock GC, Samp, Pr, Petrographic Descriptions         | OP95-008   |
| Heyson Township                   | Maple Minerals Inc.  | 1996        | IP   | 2.17576<br>(217-97)                                    |
| Heyson Township                   | Peterson, C/Spinelli, J.   | 1996        | Str, Samp  | 2.16822<br>(117-96)                                    |
| Keigat Lake Area                  | Placer Dome (CLA) Ltd. (Birch Lake Property)                                 | 1996        | DDH(4)=1089.76M, Assays                              | 2.17104<br>(15-97)                                     |
| Lingman Lake Area                 | Echo Bay Mines Ltd.  | 1996        | DDH(11)=1999.5M, Assays                              | 2.17385<br>(122-97)                                    |
| Mitchell Township                 | Cumberland Resources Ltd. (Rio Algom Option)                                 | 1996        | DDH(2)=548.03M, Whole Rock Geochem                   | 2.16923<br>(133-96)                                    |

**Table 3.** cont'd. Assessment files received in the Red Lake District in 1997.

| <b>Township or Area</b>                  | <b>Company Name</b>  | <b>Year</b> | <b>Type of Work</b>     | <b>AFRO Number<br/>(Report of Work<br/>Number)*</b> |
|--|--|-------------|-------------------------|---|
| Narrow Lake Area and<br>Skinner Township | Hawke, D.  | 1995        | GC, Pr, Samp            | OP95-186  |
| Shabumeni Lake Area                      | Hodgson, Rand (Guest<br>Prospect)                          | 1995        | VLFEM, Pr, Samp, Assays | OP95-057<br>(Same as 2.16559)                       |
| Uchi Lake and Earngey<br>Township Area   | Wolfden Resources Ltd.<br>(English/Green Uchi Op-<br>tion) | 1996        | P, Lc                   | 2.17163<br>(21-97)                                  |

*\* Corresponds to Resident Geologist Office file designation*

# Exploration Activity

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A complete summary of exploration activity is given in Table 4. Three major mining companies, **Noranda Mining and Exploration Inc., Placer Dome North America and Goldcorp Inc.** continued long-standing exploration programs on a number of properties in the Red Lake and Birch-Con- federation –Uchi lakes belts. Described below are other programs with significant exploration expen- ditures and/or significant known results, or where their location is of particular strategic or geologic interest. Exploration information included in this section is taken from the assessment files in the Red Lake Resident Geologist's office, unless otherwise indicated. Programs are keyed with numbers in parentheses to Table 4 and Figures 1 and 2.

## RED LAKE GREENSTONE BELT

**Rupert Resources Ltd.** and joint venture partner **ITL Capital Corp.** continued drilling a deep vertical exploration hole on the Durham-McEwen claim block in Balmer Township (43). The claim block lies immediately east of Goldcorp Inc.'s Red Lake mine. The program was initiated in late 1996, as an attempt to test for the possible extension of the Red Lake mine ore zones at depth. It involves drilling through a sedimentary sequence that overlies the favourable volcanic sequence that hosts both the Red Lake Mine and Placer Dome North America's Campbell Mine. Hole 96-1 was started in No- vember 1996, and collared approximately 4,000 feet southeast of Goldcorp Inc.'s thirtieth level ore zone, which trends to the southeast (Canada Stockwatch, February 20, 1997). Mafic volcanic rocks were intersected at a vertical depth of 3,200 feet. Drilling ended in March, at a depth of 5,520 feet, and assay results were reported to show intermittent anomalous values within the mafic metavolcanic rocks (Canada Stockwatch, April 3, 1997). Plans to drill wedge holes from 96-1 were put on hold pending drilling a second vertical hole further to the south (Canada Stockwatch, April 15, 1997). No further drilling has been done (personal communication, Carl Huston, ITL Capital Corp., January 23, 1998).

**Canadian Golden Dragon Resources Ltd.** and joint venture partner **Caesars Gold Ltd.** contin- ued exploration on their 225 claim unit Dixie Lake gold property (3), following geochemical and in- duced polarization (IP) surveys done in 1996. The property includes the 88-4 Zone at the Dixie Creek prospect, where Teck Corporation, in 1990 calculated a possible tonnage of 1.1 million tons grading 0.10 ounce gold per ton. A press release (Canada Stockwatch, December 6, 1996) had indicated that assay results from three IP anomalies which run parallel to the 88-4 Zone all returned anomalous gold values in both humus and soil samples. High gold values were also obtained from geochemical sam- ples on strike of the 88-4 Zone, and higher than those over the 88-4 Zone itself. In January and Feb- ruary, 1997, 15 holes were diamond drilled, for a total of 2556.3 m (8360 ft), testing the extension of the 88-4 Zone and four different parallel structures, and two other areas on the property were surveyed with IP, as follow-up to airborne electromagnetic (EM) and magnetic surveys (Canada Stockwatch, January 24, February 5 and February 14, 1997). Pyrrhotite-chert zones with minor chalcopyrite with adjoining graphitic argillite were intersected in most holes, and a total of nine structures that had been outlined by IP surveys were tested. Hole 97-21 intersected a 40 m wide zone of quartz porphyry and highly altered felsic tuffs with disseminated pyrite and minor sphalerite, in which values of 0.02 to 0.03 ounce gold per ton were obtained (Canada Stockwatch, March 19, 1997). Numerous assays in the 0.02 to 0.03 ounce gold per ton range were also obtained from a hole drilled in the east end of the 88-4 Zone. From the geophysical surveys, it has been interpreted that the 88-4 Zone has been fault- offset 1.3 km to the south, at its south east end, but this projected zone has not been drill tested. A 10 to 15 drill hole program planned for spring 1997 was not conducted, and the property has been re- turned to the optioner (Perry English, prospector, personal communication, 1998). Further discussion of the Dixie Creek prospect is given under "Property Examinations".

**Cross Lake Minerals Ltd.** continued exploration on its 474 claim unit Pakwash Lake gold and base metal property (8), that lies immediately to the north of the Dixie Lake gold property of Cana-

dian Golden Dragon Resources Ltd./Caesars Gold Ltd. This follows IP and geochemical surveys done in 1996, when four IP anomalies were identified, two of them coincident with soil and humus gold and arsenic anomalies. Large boulders with copper mineralization have reportedly been found 5 km south of the property. In January, 1997, a proposed 6-hole diamond drill program totalling 1 000 m was commenced, to test 5 different IP anomalies. Three holes were drilled, totalling 525 m., one of which intersected a silicified zone with 5-10% combined pyrrhotite and chalcopyrite over a 3 m width (press release, Cross Lake Minerals, Ltd., January 22, 1997). No assay data have been released.

**Table 4.** Exploration activity in the Red Lake District in 1997.

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

| <b>No</b> | <b>Company/Individual<br/>(Occurrence Name or Property)</b>  | <b>Township/Claim Map Area<br/>(Commodity)</b> | <b>Exploration Activity<br/>(Assessment File or<br/>Incentive Program)</b> |
|-----------|--|--|--|
| 1         | Adaco Resources Inc.   | Bateman Township and Blackbear Lake Area (Au)  | DD   |
| 2         | Buckner, J.  | Corless and Dent townships (BM, Au)            | GL, Lc (2.17386)   |
| 3         | Canadian Golden Dragon Resources Ltd./ Caesars Gold Ltd. (Dixie Lake Property)                         | Dixie Lake Area (Au)                           | IP, DDH(15)=2566.3M (2.17546)  |
| 4         | Canadian Golden Dragon Resources Ltd./ Caesars Gold Ltd./First Point Capital Corp. (Gullrock Property) | Byshe Township (Au)                            | Lc, IP   |
| 5         | Campbell, G./Hawke, D. (Joy North Property)  | Gerry Lake Area (BM)                           | Pr, Lc (2.17829)   |
| 6         | Canadian Mining International Ltd. (English/Tetlock Option)  | Baird Township and Faulkenham Lake Area (Au)   | GM, VLFEM, Lc (2,17516)  |
| 7         | Corsair Exploration Inc.   | Coli Lake and Blackbear Lake areas (Au)        | Reverse Circulation ODH(27)=1080M  |
| 8         | Cross Lake Minerals Ltd. (Pakwash Lake Property)   | Dixie Lake Area (Au)                           | DDH(3)=525M  |



**Table 4.** cont'd. Exploration activity in the Red Lake District in 1997.

| <b>No</b> | <b>Company/Individual<br/>(Occurrence Name or Property)</b>             | <b>Township/Claim Map Area<br/>(Commodity)</b> | <b>Exploration Activity<br/>(Assessment File or<br/>Incentive Program)</b> |
|-----------|---|--|--|
| 9         | Cross Lake Minerals Ltd. (Gerry Lake Property)                          | Gerry Lake Area (BM)                           | Lc, IP (2.17919)   |
| 10        | Cumberland Resources Ltd. (Fly Lake Property)                           | Uchi Lake and Earngey Township Area (BM)       | DD   |
| 11        | English, P.   | Bateman Township (Au)                          | GM, Lc (2.17289)   |
| 12        | English, P.   | Baird Township (Au)                            | Lc   |
| 13        | Freewest Resources Canada Inc. (Ben Lake Road Property)                 | Fredart Lake Area (BM)                         | DDH(2)=200M, GM, Lc, Pr, VLFEM   |
| 14        | Freewest Resources Canada Inc. (Birch Lake Property)                    | Casummit Lake Area (Au)                        | Lc, Pr, Samp   |
| 15        | Freewest Resources Canada Inc. (Birch Lake North Property)              | Casummit Lake Area (Au)                        | Pr   |
| 16        | Gold Canyon Resources Inc. (Spring-pole Property)                       | Casummit Lake Area (Au)                        | DD   |
| 17        | Goldcorp Inc. (Rowan Project)   | Hammell Lake (Todd Township) Area (Au, BM)     | DDH(2)=904M (2.17828)  |
| 18        | Goldcorp Inc. (Marboy Property)   | Dome Township (Au)                             | DDH(2)=592M (2.17921)  |
| 19        | Hermiston, W.   | Longlegged Lake Area (BM, Au)                  | Tr, Str, Pr  |
| 20        | Island-Arc Resources Corp/Wolfden Resources Inc. (Martin Bay Property)  | Fairlie Township (Au)                          | GM (2.17419)   |
| 21        | Island-Arc Resources Corp/Wolfden Resources Inc. (Russet Lake Property) | Baird Township (Au)                            | GL, GM, Samp, Pr   |
| 22        | Knappett, R.  | Shabumeni Lake Area (Au)                       | Pr   |
| 23        | Lucero Resource Corp. (Gullrock Lake Property)                          | Willans Township (Au)                          | Lc, Str, GL, Samp, GM, IP, VLFEM   |
| 24        | Maciejewski, A.J.   | Ball Township (BM, Au)                         | Str, Samp (2.17640)  |
| 25        | Maple Minerals Inc.   | Dome Township (Au, BM)                         | GM, VLFEM, IP, Lc (2.17573)  |
| 26        | Murgor Resources Inc. (East Bay Property)                               | Bateman Township and Blackbear Lake Area (Au)  | GM, Lc (2.17823)   |
| 27        | Murgor Resources Inc. (Maskooch Lake Property)                          | Slate Lake Area (BM)                           | Str, Lc, GM  |
| 28        | Murgor Resources Inc. (Mink Lake and Birch Lake Properties)             | Casummit Lake and Keigat Lake areas (Au)       | Lc, GM   |
| 29        | Noranda Mining and Exploration Inc. (Fredart East Property)             | Belanger Township (BM)                         | DDH(2)=541M, GC, Samp, Borehole PEM, GL (2.17252)                          |
| 30        | Noranda Mining and Exploration Inc. (Ten Mile Creek)                    | Karas Lake and Bruce Lake areas (BM)           | DD   |
| 31        | Noranda Mining and Exploration Inc. (Ben East Property)                 | Gerry Lake and Fredart Lake areas (BM)         | DD   |
| 32        | Noranda Mining and Exploration Inc. (Copperlode Property)               | Belanger Township (BM)                         | DD   |
| 33        | Noranda Mining and Exploration Inc. (Garnet Lake Property)              | Belanger Township (BM)                         | DD, Lc   |
| 34        | Phelps Dodge Corp. of Canada Ltd.                                       | North Spirit Lake Area (Au)                    | DDH(5)=417.5M  |
| 35        | Placer Dome North America (East Bay Property)                           | Bateman Township (Au)                          | DDH(1)=617' (2.17311)  |
| 36        | Placer Dome North America (Todd Township Property)                      | Hammell Lake (Todd Township) Area (Au)         | GL, Samp, Assays (2.17436), DD   |

**Table 4.** cont'd. Exploration activity in the Red Lake District in 1997.

| No | Company/Individual<br>(Occurrence Name or Property)                     | Township/Claim Map Area<br>(Commodity)              | Exploration Activity<br>(Assessment File or<br>Incentive Program) |
|----|---|---|---|
| 37 | Placer Dome North America (Snib Lake Property)                          | Heyson Township (Au)                                | DD  |
| 38 | Placer Dome North America (Faulkenham Lake)                             | Baird Township (Au)                                 | DD, Lc  |
| 39 | Romios Estates (O'Keefe Lake Property)                                  | Balmer Township (Au)                                | DD  |
| 40 | Rubicon Minerals Corp. (Fisher Islands Property)                        | Dome and Fairlie Townships (Au)                     | GM, Lc (2.17290), DD reloging                                     |
| 41 | Rubicon Minerals Corp. (Headway Red Lake Property)                      | Dome Township (Au)                                  | Prospecting, GL   |
| 42 | Rubicon Minerals Corp. (Peterson Red Lake Property)                     | Balmer Township (Au)                                | Prospecting, GL   |
| 43 | Rupert Resources Ltd./ITL Capital Corporation (Durham-McEwen Property)  | Balmer Township (Au)                                | DDH(1)=5520'  |
| 44 | Smith, D.   | Honeywell Township and Shabumeni Lake Area (BM, Au) | Pr  |
| 45 | T & H Resources Ltd./Wolfden Resources Inc. (Setting Net Lake Property) | Setting Net Lake Area (Au, Ag, Cu, Zn)              | GL, GM, GEM, DDH(14)  |
| 46 | Tri-Lateral Investments Corporation (Adams Lake Property)               | Balmer Township (Au)                                | Lc, Samp, GM, DDH(7)  |
| 47 | Tri-Lateral Investments Corporation                                     | Hammell Lake (Todd Township) Area (Au)              | Samp  |
| 48 | Tri-Lateral Investments Corporation                                     | Heyson Township (Au)                                | Samp  |
| 49 | Tri Origin Exploration Ltd.   | Gerry Lake and South of Otter Lake areas (Au)       | GM, Lc  |
| 50 | Williamson, J./English, P. (Hemming Occurrence)                         | Knott Township (Au, BM)                             | Str, Samp, Assays (OPAP) (2.17815)                                |
| 51 | Wolfden Resources Inc. (Hazard Lake Property)                           | Uchi Lake and Earngey Township Area (Au)            | DDH(5), GM, IP, Lc  |

## BIRCH-CONFEDERATION-UCHI LAKES GREENSTONE BELT

**Gold Canyon Resources Inc.** continued exploration of the Springpole Lake gold prospect (16). A diamond drill program under the management of consultants A.C.A. Howe International Limited was carried out during early 1997. All 23 holes (BL 217 to BL 239) were drilled on the East Extension and North Porphyry zones, and followed drill programs done in 1996 on the East Extension, Deep Portage (the on-land extension of the Portage zone), and other zones with former joint venture partner Santa Fe Canadian Mining Limited. Of particular interest were intersections in an interpreted breccia pipe, one of which (BL 228) intersected a section of 80.5 feet grading 0.543 ounce Au per ton. In May, the company announced (press release, May 15, 1997) that it had signed a letter of intent with Cameco Gold Inc., for the latter company to acquire an option to earn a 50% interest in the Springpole project. However, Cameco Gold Inc. did not exercise its option, and Gold Canyon announced its intent to commence a summer drill program to further test the East Extension Zone (press release, June 16, 1997). The drill program was not conducted in 1997, but was postponed to early 1998. At time of writing (January, 1998) the drill program is underway, and designed to test the combined open pit possibilities of the East Extension North Porphyry and intervening Contact Zone (press release, January 13, 1998).

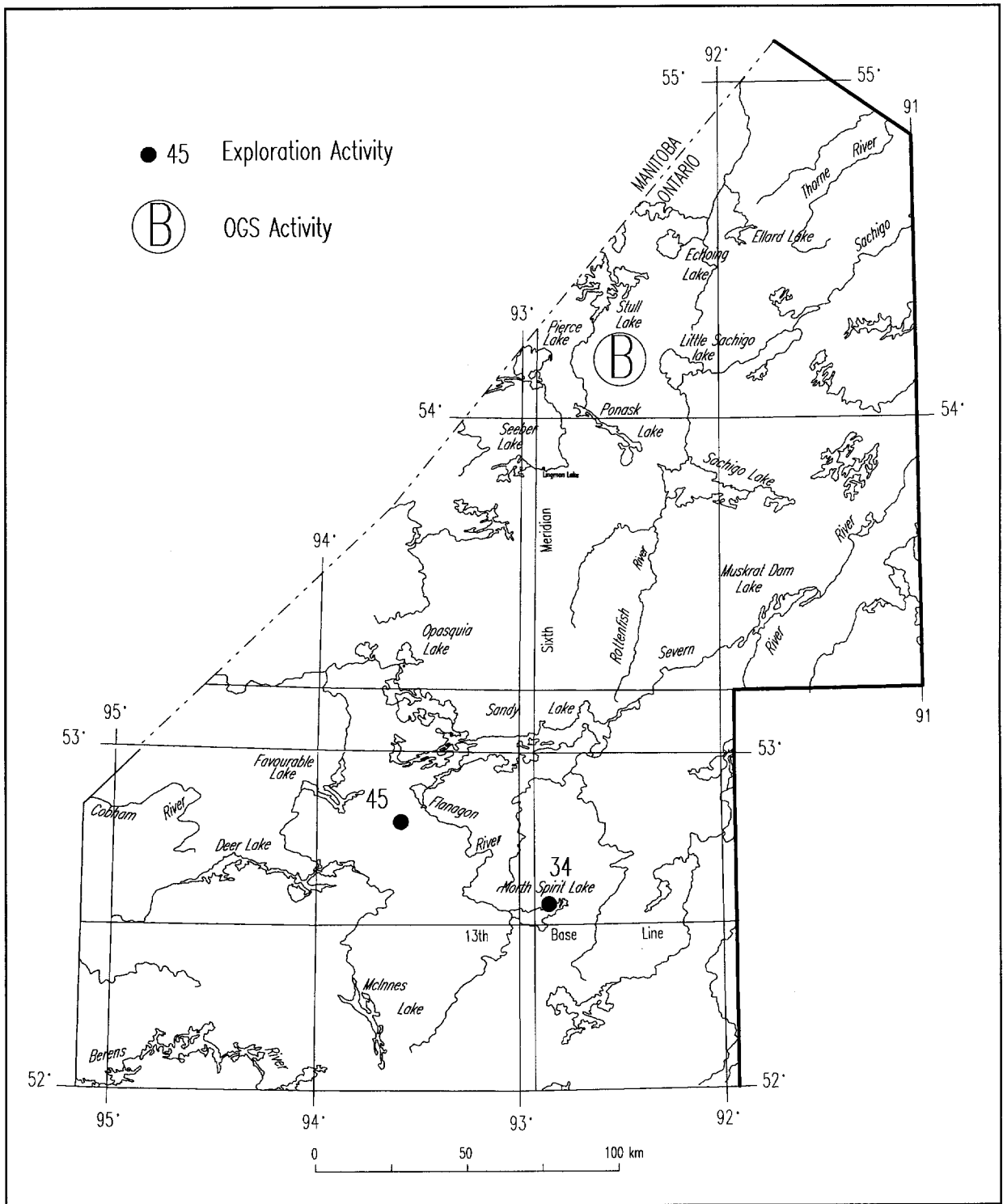


Figure 1. Red Lake District (North Part): exploration and OGS activity, 1997

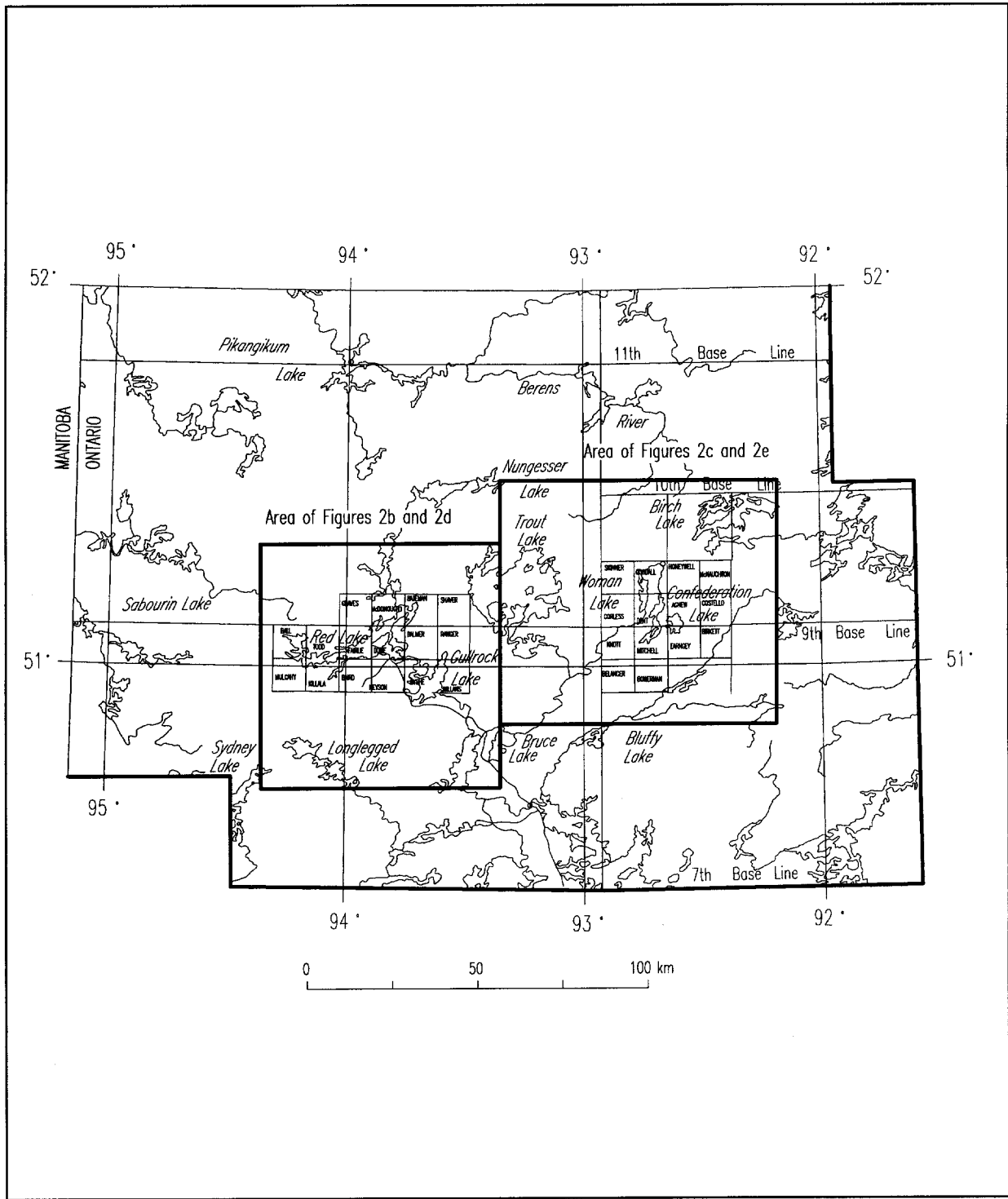


Figure 2a. Red Lake District (South Part): location map.

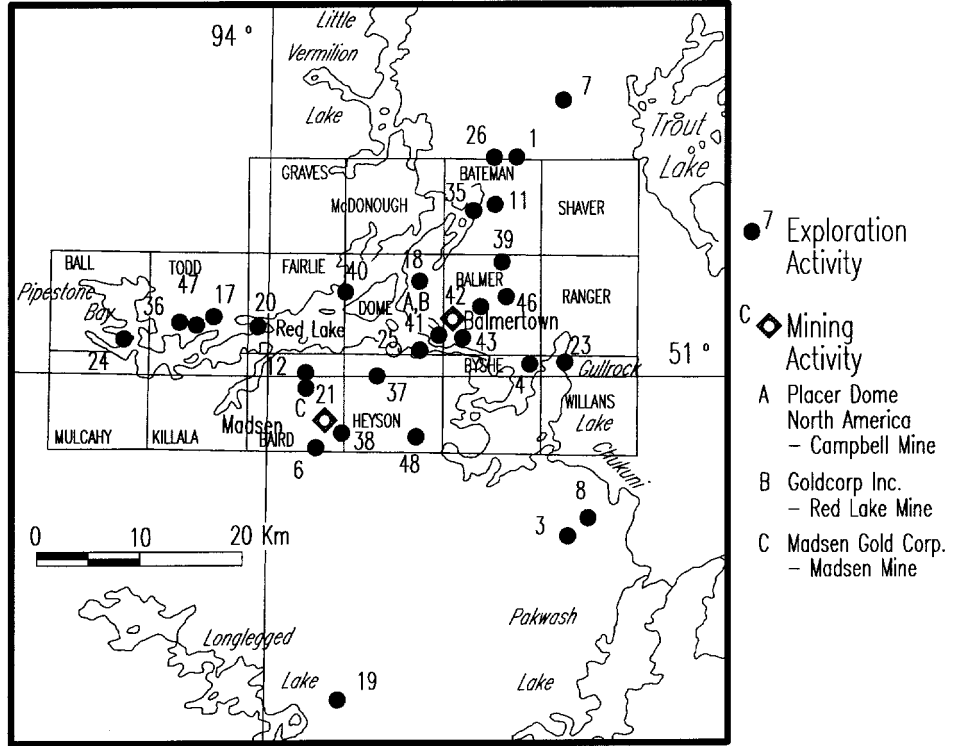


Figure 2b. Red Lake greenstone belt: exploration and mining activity.

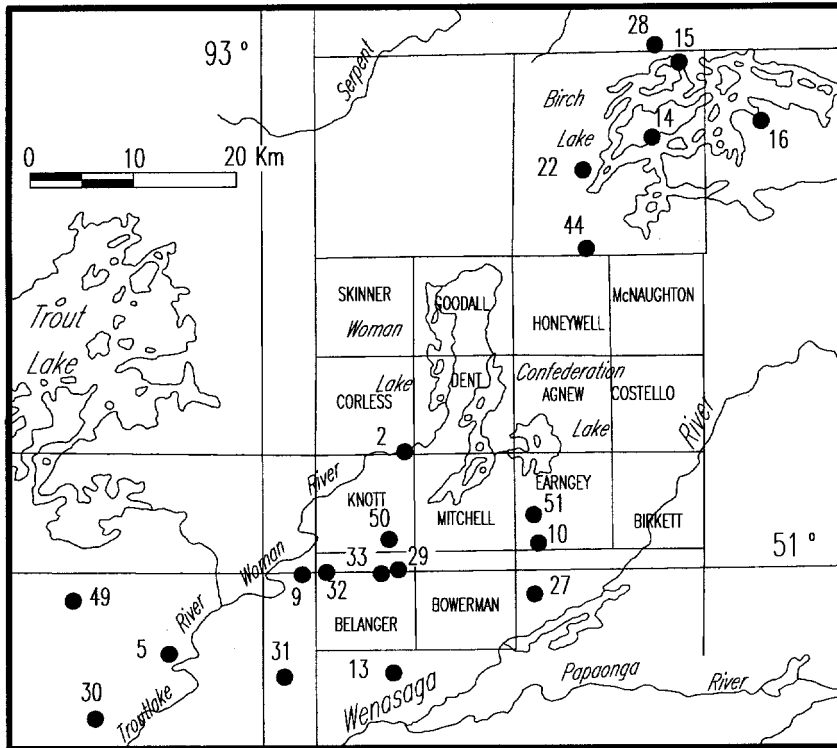


Figure 2c. Birch-Confederation-Urichi greenstone belt: exploration activity

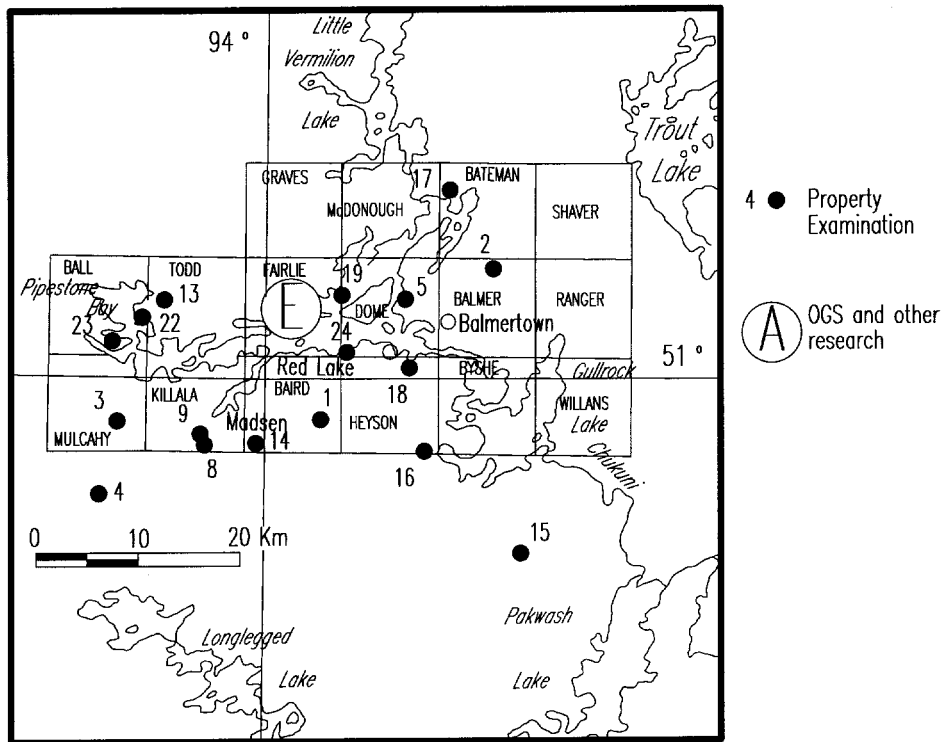


Figure 2d. Red Lake greenstone belt: property examinations and other research activities, 1997

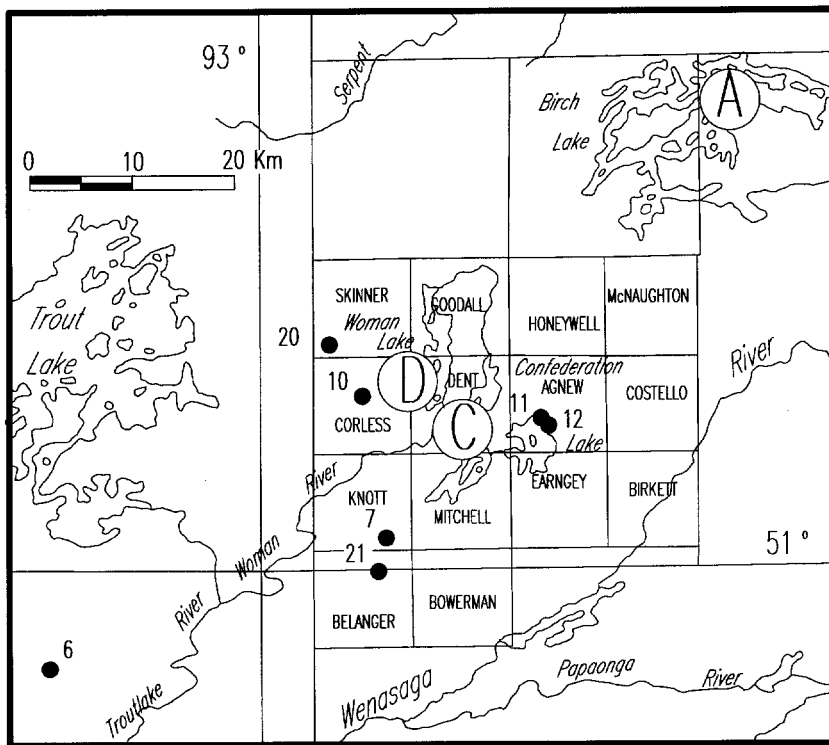


Figure 2e. Birch-Confederation-Uchi lakes greenstone belt: property examinations, OGS and other research activities, 1997.

## NORTHERN GREENSTONE BELTS

Only two exploration projects were carried out in greenstone belts north of latitude 52°N.

**T & H Resources Ltd.** and joint venture partner **Wolfden Resources Inc.** conducted a 13 hole diamond drill program in the Setting Net Lake greenstone belt (45). Following initial drilling in 6 holes, one of which returned 6.4 feet grading 0.326 ounce Au per ton, the company announced results from 6 more holes (press release, T & H Resources Ltd., July 31, 1997). These further tested the Kega zone. Values of up to 2.35 ounces Au per ton over a 5.1 foot core length in one hole were reported.

**Phelps Dodge Corp. of Canada Ltd.** conducted a 5 hole diamond drill program in the North Spirit Lake greenstone belt (34). These were drilled off the ice on the lake early in 1997, to test geophysical conductors. No further work is planned for the immediate future (personal communication, Paul Chamois, Phelps Dodge Corp. of Canada, 1998)

# Resident Geologist Staff and Activities

Staffing of the Resident Geologist Office underwent considerable change during 1997. B.T. Atkinson served as Resident Geologist until the end of May 1997 when C.E. Blackburn took over that responsibility. Administrative Assistant L. Kosloski assumed the responsibilities of Geological Assistant in June. C. Storey's title changed from Staff Geologist to District Geologist. B. Miller served as summer field/office assistant funded by the Experience'97 program.

**Table 5.** Diamond drill core received at the Red Lake Remote Drill Core Storage Site in 1997.

| Number | Company                                 | Details<br>(Commodity)   |
|--------|---|--|
| 1      | ITL Capital Corp./Rupert Resources Ltd. | Durham-McEwen Property, 1 hole 1682.5 metres (Au)<br>Balmer Township |
| 2      | East-West Resource Corporation          | Bouzan Lake Property, 13 holes 1489.5 metres (Au)<br>Heyson Township |

Office staff provided information and assistance to industry, government and university personnel through geological consultations, assessment file research, property visits and field trips to the district's geology and mineral occurrences. Geological staff represented the District at the Annual Meeting of the Prospectors and Developers of Canada in Toronto in March, and at the Northwest Ontario Mines and Minerals Symposium in Thunder Bay in March. There were 14 users of the Red Lake Remote Drill Core Storage Site. Drill core totalling 3172 metres from 2 diamond drill projects in the Red Lake area were received for permanent storage at the site (Table 5). During 1997 staff conducted 24 property and mine visits (Table 6, Figure 2), 3 field trips and 3 diamond drill core examinations.

**Table 6.** Property visits conducted by the Red Lake Regional Resident Geologist and Staff in 1997

| Number (keyed to Figure ) | Property/Occurrence  |
|---------------------------|--|
| 1                         | Madsen Mine, Baird Township                                |
| 2                         | Adams Lake (Tri Lateral Investments) Balmer Township       |
| 3                         | Laird Lake Fault Quartz Vein, Mulcahy Township             |
| 4                         | Cook Road Sulphide Occurrence, Medicine Stone Lake Area    |
| 5                         | Rahill Shaft, Dome Township                                |
| 6                         | Dixie 18 Property, South of Otter Lake Area                |
| 7                         | Hemming Gold Occurrence, Little Bear Lake & Knott Township |
| 8                         | Tack Lake Fault Pyrite Occurrence, Killala Township        |
| 9                         | Mylonite Occurrence, Killala Township                      |
| 10                        | Spud Road Quartz Veins, Corless Township                   |
| 11                        | Lost Bay Pyrite Occurrence, Agnew Township                 |
| 12                        | Mimi Point Gold Occurrence, Agnew Township                 |
| 13                        | Mount Jamie #2 Shaft, Todd Township                        |
| 14                        | Tony Maciejewski et al Property, Baird Township            |
| 15                        | Dixie Creek Prospect, Dixie Lake Area                      |
| 16                        | Bug River (Lloydex Noranda Option), Heyson Township        |
| 17                        | Hoyles Bay, Bateman Township                               |
| 18                        | Larry Herbert Harry's Corner Property, Heyson Township     |



**Table 6.** cont'd. Property visits conducted by the Red Lake Regional Resident Geologist and Staff in 1997

| <b>Number (keyed to Figure )</b> | <b>Property/Occurrence</b>                             |
|----------------------------------|--|
| 19                               | Rubicon Minerals Dorion Island Property, Dome Township |
| 20                               | Campbell-Hawke Skinner Property, Skinner Township      |
| 21                               | Noranda Garnet Lake Property, Belanger Township        |
| 22                               | Ron Melville Soapstone, Ball Township                  |
| 23                               | Bridget Lake (Redbird Gold Corporation), Ball Township |
| 24                               | Skookum Property (C. Peterson), Heyson Township        |

# Property Examinations

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Major authorship for the following property visits is indicated in parentheses following titles.

## **DIXIE CREEK GOLD PROSPECT, DIXIE LAKE AREA (C.E. Blackburn)**

The Dixie Creek prospect is located about 24 km southeast of the town of Red Lake. It is accessed by Tucky's road, a logging road to the southwest off Highway 105, and a bush road system at 4 km (Figure 3).

The prospect is located within a group of claims totalling 249 units owned by Perry English, most recently under option to Canadian Golden Dragon Resources Ltd. Discussion of exploration conducted by the latter company and joint venture partner Caesars Gold Ltd. in 1997 is given under "Exploration Activity". The claim group is situated in greenstone terrain of the western Uchi Subprovince, marginal to the granitic Longlegged Lake Dome.

The occurrence was previously visited in 1989 by staff of the Red Lake Resident Geologist's office, and an extended history of exploration up to that period is given in the Report of Activities for that year (Atkinson et al, 1990, p. 56-57). Subsequent to that report, calculations made by Teck Corporation, followed by further diamond drilling and more recent stripping by Canadian Golden Dragon, suggest a favourable reassessment of the property.

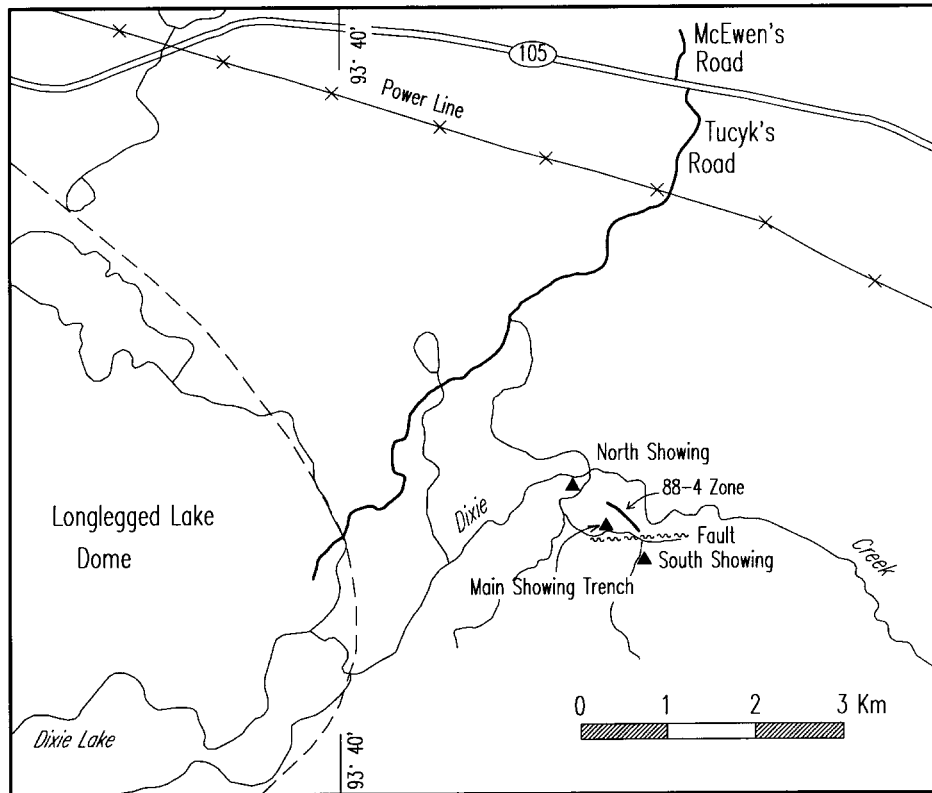
Discovery of gold in the area was first made in the 1940s. The initial gold discovery was on the south side of Dixie Creek (then known as Caribou Creek), about 4 km downstream from Dixie Lake. Because of the sketchy nature of the original maps, it is uncertain as to its location with respect to later exploration. However 4 zones were identified, the A, B, C and D zones, as reported by R. Thomson, Kenora Resident Geologist, in 1947 (Assessment Files, Resident Geologist's Office, Red Lake).

In recent years, work by Mutual Resources Ltd. in 1988 was conducted over three trenches or showings, viz. the North Showing, the Main Showing Trench, and the South Trench (Figure 3). These probably correspond to the original zones D, A and B respectively. Mutual drilled 8 holes, one of which, 88-4, established a new zone called the 88-4 Zone, delineated by co-incident magnetic and electromagnetic anomalies. A 19.4-foot section graded 0.107 ounce gold per ton including 5.6 feet grading 0.30 ounce per ton. Subsequently, in 1989, Teck Corporation under the terms of an option agreement with Mutual Resources Ltd., and as a result of further drilling calculated a drill-indicated resource of 417 000 tons grading 0.126 ounce gold per ton on the 88-4 Zone. Following further work, including more diamond drilling, by Teck in 1990, an "optimistic possible tonnage" of 1.1 million tons grading 0.10 ounce gold per ton was calculated for the zone. The zone was outlined for 700 m along strike and open to a depth of 300 m. The prospect remained idle until the 1996, when Canadian Golden Dragon Resources Ltd. conducted a 12-hole drill program, followed by a 15-hole drill program in early 1997, on their larger property. A large area was stripped in the vicinity of the South Trench, but no detailed sampling program conducted.

Staff of the Red Lake Resident Geologist's office visited the prospect in 1997. The 88-4 Zone is covered by overburden, but observations were made on the Main Showing Trench, and the newly-stripped area at the South Trench. The North Showing was covered by recently slumped overburden. Previous reports for Mutual Resources Ltd. and for Teck Corporation (Assessment Files, Resident Geologist's Office, Red Lake) indicate that the 88-4 Zone rocks intersected in drill holes are similar to those in the Main Showing Trench and South Trench areas.

At the Main Showing Trench, a weakly auriferous, 2 to 5 m thick, steeply dipping iron formation strikes approximately north, and has been traced in outcrop for about 50 m. Diamond drill hole inter-

sections indicate more than 200 m of strike length. Coarse-grained, massive mafic metavolcanic rocks bound the iron formation on both sides. The iron formation consists of thinly bedded chert-magnetite layers, though magnetic attraction is weak. Very fine-grained, disseminated sulphide minerals are pervasive. Pyrrhotite is dominant, though arsenopyrite, sphalerite and chalcopyrite have been reported. Reported gold values are mostly geochemically anomalous, the best drill intercept reported by Mutual Resources Ltd. being 0.169 ounce gold per ton over 1.0 m. The author observed previously unreported open S-folding, with steep axial planes striking about northeast, within the iron formation. No boudinaging of the unit was observed.



**Figure 3.** Dixie Creek gold prospect, Dixie Lake Area

At the South Trench area, extensive recent stripping reveals lean, cherty iron formation, similar to that at the Main Showing Trench, but tightly folded on the meter scale. Mafic volcanic rocks bound the iron formation, which may be one fold-repeated unit or a number of units. Alternating S and Z folds are parasitic to the larger folds, and help to define major fold axes. In contrast to the Main Showing Trench area, felsic dikes are intruded parallel to bedding, folded along with bedding, and boudinaged, and therefore were emplaced prior to folding. No structural measurements were taken by the author at the South Trench.

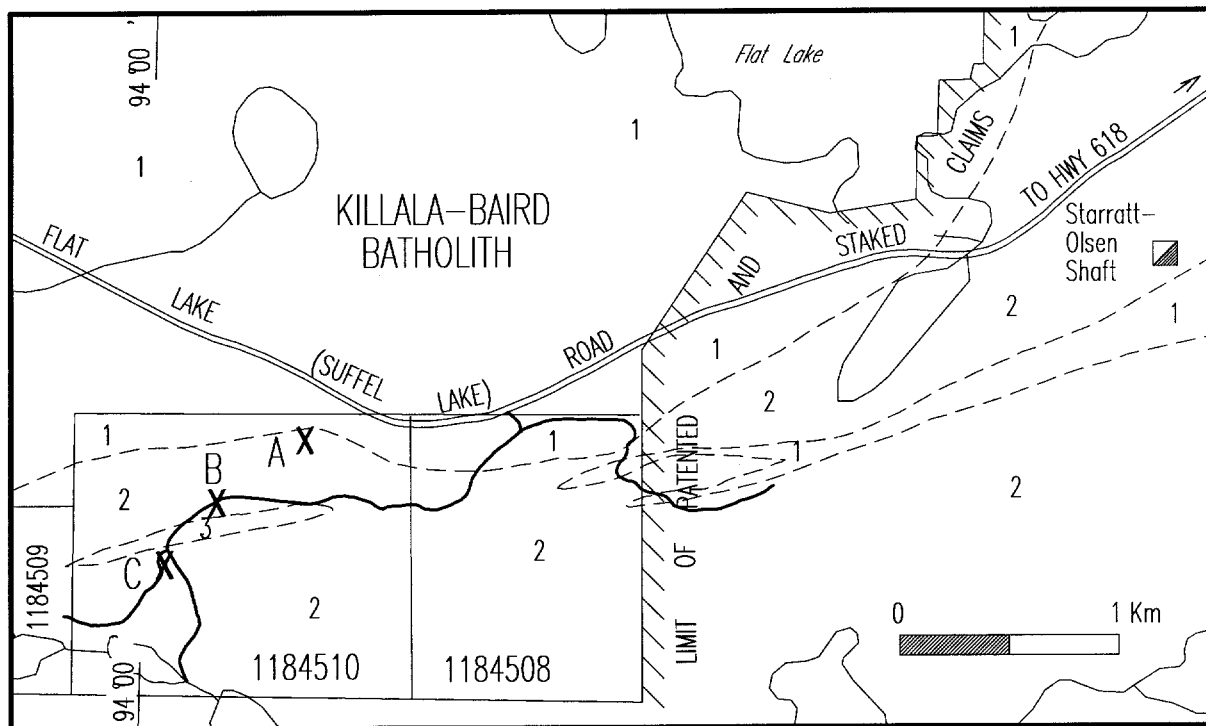
In outcrop the relationship between the two areas is unclear, but Mutual Resources' geologists interpreted an east-striking fault, defined by an electromagnetic conductor, to lie between them (Figure 3). However, Canadian Golden Dragon Resources Ltd., as a result of IP surveys, have interpreted the 88-4 Zone to be offset 1.3 km to the south along a proposed fault that may differ in orientation from that defined by Mutual Resources' geologists.

The 88-4 Zone was the main target for Teck Corporation, who outlined a sub-economic gold deposit. Canadian Golden Dragon Resources Ltd. did infill drilling on the zone, but it has not been drill tested below 300 m. Its relationship to the Main Showing Trench and South Trench areas is unclear. Although the Main Showing Trench area has been drill tested, no drilling has been done on the recent-

ly stripped South Trench area, and it has not been systematically sampled. The Dixie Creek prospect and surrounding area remains a very favourable target for economic gold concentrations.

## MACIEJEWSKI ET AL. GOLD PROPERTY BAIRD TOWNSHIP (C.E. Blackburn)

A. Maciejewski, M. Bobinski, L. Herbert and A. Hager jointly hold 3 claims (1184508, 1184509 and 1184510) totalling 33 units, 15 km southwest of the town of Red Lake, in the southwest corner of Baird Township (Figure 4). The claim group area is reached from Red Lake via Highway 618, passing the town of Madsen, and then via the Flat Lake or Suffel Lake road for a distance of 4 km. A bush road to the south enters the east end of the group, and sideroads on this road access much of the area.



**Figure 4.** Maciejewski et al. gold property, Baird Township. Legend: 1 - granodiorite; 2 - greenstone (mafic and felsic volcanic and minor intrusive rocks); 3 - felsic porphyry. Locations A, B and C discussed in text. Geology after Wallace and Atkinson 1993.

The claim group lies within metavolcanic rocks of the Red Lake greenstone belt, along its southern contact with the Killalla-Baird batholith. The greenstones are part of a sliver extending to the west, off the southwest end of the Red Lake belt and terminating in the Medicine Stone Lake area. As such, they are part of the 2.7 Ga Confederation assemblage. Atkinson and Storey (1997), in discussing recommendations for exploration, have suggested that rocks of the Medicine Stone Lake area are the faulted extension of Confederation assemblage rocks previously affected by the Flat Lake-Howey Bay deformation zone. The deformation zone is widely recognized as a major gold-bearing structure of the Red Lake greenstone belt, hosting 5 of the past-producing gold mines. Right lateral faulting was suggested to have occurred along the interpreted Telescope Lake fault. The southern contact of the Killalla-Baird batholith is interpreted by Atkinson and Storey (1997) to be the locus of the Telescope Lake fault. The present area lies on the south side of and in close proximity to this interpreted fault. In earlier mapping, Wallace and Atkinson (1993) interpreted the complex stratigraphy overprinted by the Flat Lake-Howey Bay deformation zone in the vicinity of the Starratt-Olsen mine (Fig-

ure 4) to finger into the present claim group, where some of the rock units considered critical for gold concentration are seemingly absent. No evidence of a major fault, such as the interpreted Telescope Lake fault, is shown on the map (Wallace and Atkinson 1993), and the writer suggests that this interpretation may still be valid.

Exploration in the vicinity of the claim group has been limited in comparison to that in the area underlain by stratigraphy of the Flat Lake–Howey Bay deformation zone to the northeast. This is probably attributable to both perceived differences in lithologic units and degree of deformation perceived to be critical to development of a favourable gold environment, and to the fact that to date few gold occurrences have been found southwest of the Starratt–Olsen mine. Lower outcrop density on the claim group and adjacent area may have both obscured lithologic and deformational features, and provided less opportunity for traditional prospecting techniques.

Records of exploration in the vicinity of the group (Assessment Files, Resident Geologist's Office, Red Lake) go back to the 1940s, when Mallen Red Lake Gold Mines Limited, Riverdale Gold Mines Ltd., Camwe Snow Lake Mines Limited and Wenga Gold Mines Limited explored separate parcels of ground. Limited information on geological surveying, prospecting and diamond drilling suggests that only low gold values were found. Prior to work by the present claim holders, the only other work on file dates from 1982, when Cominco Ltd. conducted ground electromagnetic and magnetic surveys over the western part of the current group. Commencing in 1990, Tony Maciejewski and partners have prospected, stripped, trenched, and conducted magnetic, electromagnetic and geologic surveys over the claim group. This was accomplished with the help of grants under OPAP in 1990 and 1992.

Staff of the Red Lake Resident Geologist's office visited the property in 1997. Stripping, trenching and sampling by the partnership has been concentrated in the central part of the claim group, on claim 1184510, at localities A, B and C in Figure 4. Assays obtained to date by A. Maciejewski have returned trace to anomalous gold values. The highest values were obtained from locality B, where 962 ppb Au (0.028 ounce Au per ton) and 639 ppb Au (0.019 ounce Au per ton) were obtained from short channel samples at two different trenches (Assessment Files, Resident Geologist's Office, Red Lake). According to reports by A. Maciejewski, the former came from the edge of quartz porphyry dike, with traces of pyrite and chalcopyrite present. The second was from a quartz vein in sheared quartz–feldspar porphyry. The best assay to date returned 0.09 ounce Au per ton, also from locality B (A. Maciejewski, personal communication, 1997). The writer visited ground between localities B and C, and observed strong deformation and alteration in all rock types. Predominant rock types included probable mafic metavolcanic rocks with abundant secondary epidote in fractures as well as pyrite concentrations, and felsic porphyries, commonly strongly fractured and veined by epidote and pyrite stringers. Quartz veining is commonly irregular in size, form and distribution, and biotite alteration is also present. As depicted on map P.3196 (Wallace and Atkinson 1993), and shown in Figure 4, an east-striking felsic porphyry unit lies between localities B and C; it is probably a hypabyssal dike or sill. This may be an offshoot of the granodioritic Faulkenham Lake intrusion on strike to the east, or alternatively related to a felsic unit depicted on map P.3248 (Atkinson 1995) on strike to the west in Killalla Township. Three samples were taken for assay (Geoscience Laboratories, Ontario Geological Survey) at locality C, of representative mineralized rock types. Quartz from a vein with associated biotitic alteration along the contact between mafic metavolcanic rock and felsic porphyry assayed 6 ppb Au. A sample of felsic porphyry, veined with epidote and stringers of pyrite assayed 330 ppb Au. A sample of mafic metavolcanic rock with abundant sulphide minerals assayed 39 ppb. Although only 3 samples were taken the presence of anomalous gold is confirmed, and may be related to a specific alteration type.

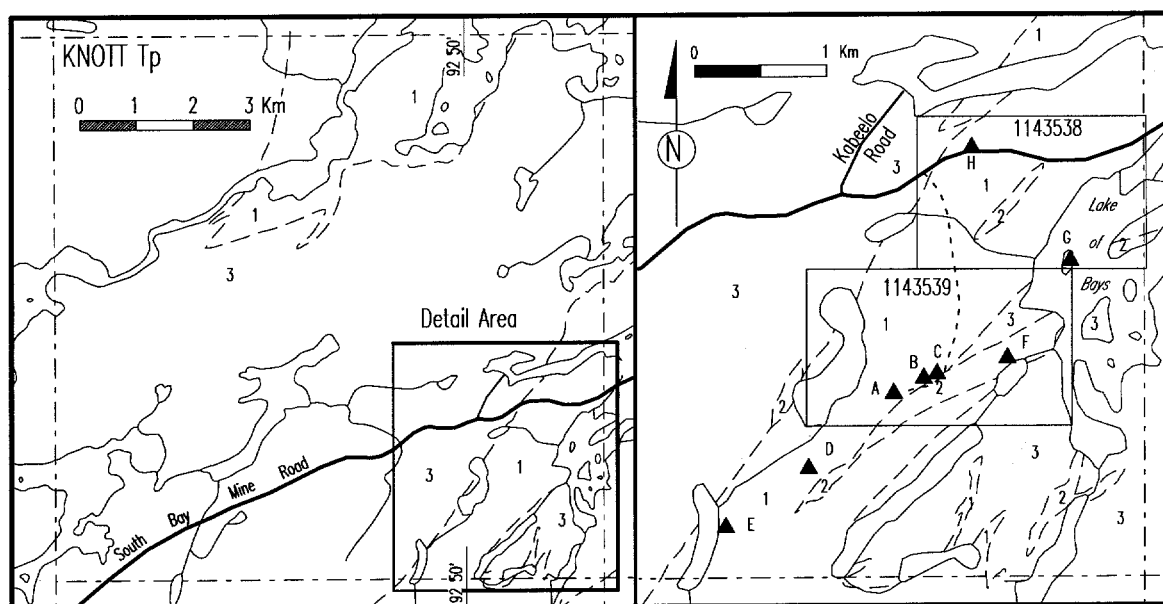
To date no high gold concentrations have been found on the Maciejewski et al. claim group. However, the possible continuity of the stratigraphy and structure of the Flat Lake–Howey Bay deformation zone into the group, low outcrop density within the group, lack of exploration in recent years, and the presence of anomalous gold make the group worthy of further exploration for gold.

## HEMMING GOLD OCCURRENCE, KNOTT TOWNSHIP (C. Storey)

The Hemming gold occurrence is located 70 km east of the town of Red Lake, in the southeast corner of Knott Township and is accessed from the South Bay Mine (or Uchi Lake) Road (Figure 5). A new logging road under construction extends southeast from the main road and continues as a trail to the showing. The property is part of a group of claims owned by P.English and J. Williamson.

The occurrence has been previously described by Pryslak (1975) and Parker and Atkinson (1992, p.251-252). Discovered in 1928 by G. Hemming, the occurrence was optioned to Sunray Syndicate in 1936 and to Dickenson Mines Ltd. in 1946 but no work was reported (Parker and Atkinson 1992). Conwest Exploration Ltd. conducted ground magnetic and electromagnetic surveys in 1969 and 1970 and M. Powley diamond drilled 1 hole for 123 feet in 1981 (Assessment Files, Red Lake Resident Geologist Office). P. English and J. Williamson staked two claims over the area of the old Hemming showing and several nearby showings in 1997, and carried out surface stripping and sampling funded by an OPAP grant. At the time of the present property visit the original Hemming pit had been cleaned out and three nearby areas had been stripped by backhoe; one at the original pit and two more to the north-east along the trend of shearing in the rocks. The stripping has uncovered a shear zone that strikes 060°. Initial examination indicates the zone is 100 m or more wide, and is extensively silicified. Discrete 0.5 to 1 cm wide quartz veins are present in many parts of the zone and a wider vein with reported gold values is exposed at the pit. The vein in the pit is 15 to 20 cm wide. The host rocks are mafic to intermediate metavolcanic rocks that are possibly pillowed. Primary textures are obliterated in the shear zone and only vague pillow-like outlines are visible in less altered rocks south-east of the original pit. The veins are largest and silicification most intense at the pit but silicification extends throughout the sheared rocks. The rocks are sericitic and contain pyrite, pyrrhotite and chalcopyrite. Several mineralized zones in addition to the original Hemming vein were identified by P. English and J. Williamson. Eight of the zones are shown on Figure 5.

Zones A is on the original Hemming pit and B and C are on associated shear zones. All three zones were stripped and sampled by P. English and J. Williamson. Two of three samples from the main Hemming pit taken by Pryslak (1975) assayed 0.11 ounces Au per ton and 0.13 ounce Ag per ton and 0.59 ounce per ton Au and 0.41 ounce per ton Ag respectively. The third sample contained



**Figure 5.** Hemming gold occurrence, Knott Township. Legend: 1 – mafic and intermediate metavolcanic rocks; 2 – mafic intrusive rocks, minor flows; 3 – granitoid rocks. Locations A through H discussed in text. Geology after Pryslak 1971.

only trace amounts of gold and silver. Assays from samples taken by P. English and J. Williamson indicated erratic gold values in the quartz veins and alteration zone. Samples of the vein assay as high as 0.24 ounce per ton Au while four other samples contained 3180 ppb Au and 0.8 ppm Ag, 790 ppb Au and 0.5 ppm Ag, 1040 ppb Au and 0.2 ppm Ag and 70 ppb Au and 1.2 ppm Ag respectively. Samples from zones B and C had low gold values but one sample contained 1.8 ppm Ag. Showing D is a large white quartz vein mentioned in Pryslak's (1975) description of the property. Samples of this vein contained only background levels of gold. Showing E is a quartz vein with pyrite, pyrrhotite and chalcopyrite hosted by sheared intermediate to felsic metavolcanic rocks. Three samples taken by P. English and G. Williamson from this showing assayed 2550 ppm Cu and 1.9 ppm Ag, 1400 ppm Cu and 0.9 ppm Ag and 3050 ppm Cu and 3.1 ppm Ag respectively but only low gold values. These results agree with those from previous exploration (Assessment Files, Red Lake Resident Geologist's Office, Red Lake) when the site was identified as a silver-copper showing. Showing F is a quartz vein with pyrite, pyrrhotite and chalcopyrite hosted in silicified mafic metavolcanic rocks. Sampling of this showing by P. English and J. Williamson gave low but anomalous gold values, with a maximum of 150 ppb Au. Showing G is located on a small island in Lake of Bays. One sample taken by P. English and J. Williamson assayed 0.05 ounce Au per ton. Several quartz carbonate veins and pyrite-pyrrhotite showings are found on the west shore of Lake of Bays, but samples taken from these by P. English and J. Williamson assayed low gold values. Showing H is a previously explored copper showing on the north side of the South Bay Mine Road. Mineralization consists of quartz veins accompanied by pyrite and chalcopyrite hosted in mafic metavolcanic rocks. Samples taken from this showing by P. English and J. Williamson assayed up to 3600 ppm Cu but only low gold values. The showings and associated alteration zones cover an area 0.5 km wide with a 3 km strike length. Presence or lack of continuity of the quartz veins and altered shear zones between the showings both along and across strike still requires investigation.

The Hemming property shows widespread, erratic gold mineralization. Two of the showings sampled show significant gold assays and all of them show extensive chlorite-sericite alteration and silicification. The most intensely prospected part of the property is located within metavolcanic rocks between a mafic intrusive body and granitoid rocks that occupy a large portion of Knott Township. The work completed to date confirms that the Hemming occurrence contains gold bearing quartz veins and alteration zones, but the width and length of the shearing and alteration in the rocks remains to be shown. There is potential for discovery of both gold and base metal concentrations on this property.

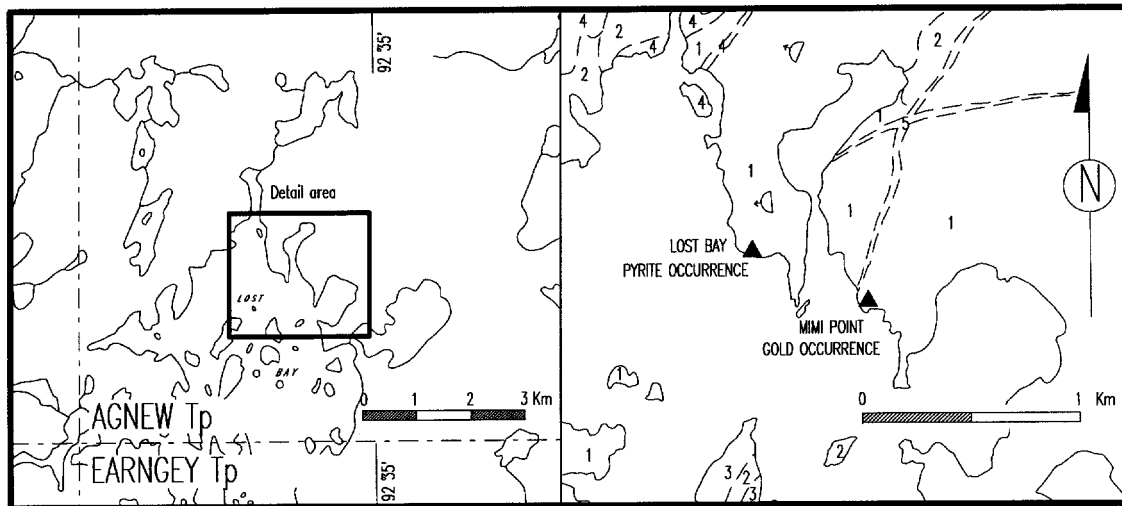
## **LOST BAY OCCURRENCES, AGNEW TOWNSHIP (C. Storey)**

The Lost Bay occurrences consist of two separate mineralized sites, the Mimi Point Gold occurrence and the Lost Bay pyrite occurrence (Figure 6). Both occurrences are on the north shore of Lost Bay of Confederation Lake, 86 km east of Red Lake and are only accessible by water. The area was initially explored many years ago: Bruce (1929) and Harding (1936) show claims on both the Mimi Point Gold occurrence and the nearby Lost Bay pyrite occurrence. The writer visited both occurrences in 1997.

R. Knappet who staked a 4-unit claim over it in 1996 presently holds the Mimi Point gold occurrence. The old trenches had been cleaned and sampled by G. Desmeules and W. McNerney in 1989 (Assessment Files, Resident Geologist's Office, Red Lake).

The area is underlain by west-facing, pillowed, mafic metavolcanic rocks intruded by narrow quartz porphyry dikes and minor gabbro (Thurston et al. 1975). The gabbro units may be coarse mafic flows. The main part of the occurrence consists of a "crack and seal" quartz vein approximately 25 cm wide that extends north from Mimi Point. The vein is exposed in a series of trenches and stripped areas 60 m long and 1 to 2 m wide. At the time of the visit most of the trenches were filled with water and forest debris. The host for the vein is mafic pillow breccia and minor quartz-feldspar porphyry. The vein contains pyrite, pyrrhotite and minor chalcopyrite as does the host rock near the vein contacts. The mafic metavolcanic rocks are silicified over a width of 20 cm on either side of the vein. Sixteen samples of both the vein and host rock (12 channel samples, 4 grab samples) by W. McNerney

and G. Desmeules gave gold assay values ranging from trace to 0.38 ounce per ton over 1 foot. The higher gold values are associated with samples of predominantly vein material and W. McNerney and G. Desmeules indicated they are usually accompanied by pyrite, pyrrhotite and chalcopyrite. During this visit seven grab samples of the vein and host rock were taken for gold assay with the following results (Geoscience Laboratories, Ontario Geological Survey): 170 ppb from the quartz vein with pyrite and tourmaline; 230 ppb from feldspar porphyry wall rock; 91 ppb from feldspar porphyry wall rock; 2600 ppb from the quartz vein with pyrite; 910 ppb from the quartz vein; 340 ppb from the quartz vein with attached host rock (east contact zone); and 390 ppb from the contact of the vein with mafic metavolcanic rock.



**Figure 6.** Lost Bay gold occurrences, Agnew Township. Legend: 1 – mafic metavolcanics; 2 – intermediate metavolcanics; 3 – felsic metavolcanics; 4 – gabbro; 5 – quartz-feldspar porphyry. Symbols show pillow tops. Geology after Thurston et al. 1975.

The Lost Bay occurrence was open for staking at the time of the writer's visit. There is no assessment work on file and no work is reported by either Harding (1936) or Thurston et al (1975). Map P.1056 (Thurston et al, 1975) indicates claims over the occurrence in 1975. The area is underlain by north-northeast striking pillowed mafic metavolcanic rocks intruded by narrow quartz porphyry dikes and minor gabbroic bodies (Thurston et al 1975) that may be coarse mafic flows.

A circular pit 2 m in diameter and approximately 2.5 to 3 m deep exposes altered feldspar porphyry with disseminated euhedral pyrite. Many irregular quartz veins one to two centimetres wide cut the porphyry to form a stockwork. As much as a third of the rock exposed in the pit is composed of white quartz and the remainder is buff to pink feldspar porphyry with pyrite. The sulphides appear to be restricted to the altered feldspar porphyry. The contact between this rock and the pillowed mafic metavolcanic rocks is obscured by overburden. The altered and mineralized zone is exposed over a width of approximately 3 m but its strike direction cannot be determined from the available exposures. A single sample of this material was taken for assay, but gold was not detected (Geoscience Laboratories, Ontario Geological Survey).

Both these occurrences are hosted by mafic metavolcanic rocks and are associated with quartz-feldspar porphyry intrusions. There is silicification of the host rock at both occurrences and abundant disseminated pyrite at the Lost Bay occurrence. The Mimi Point vein has a northerly trend similar to that at the Hill-Sloan-Tivy vein and the Grasset vein in Earney Township, 3.5 km to the south of Mimi Point. Gold was produced from the Grasset vein as part of the production from the Uchi mine from 1940 to 1942. The two occurrences are likely to have been formed as part of the same mineralizing event that created the Uchi mine deposits. The area around the Mimi Point and Lost Bay occurrences has received relatively little recorded exploration attention and warrants further exploration for gold.



# Recommendations for Exploration

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## RARE METAL PEGMATITES

The recent success of research work conducted in the Kenora Resident Geologist's District by the Ontario Geological Survey on the newly discovered Separation Lake rare metal pegmatite field (Breaks and Tindle 1997a, b) has led to exploration programs in that area by Avalon Ventures Ltd., Tantalum Mining Corporation of Canada Ltd. and Champion Bear Resources Ltd. (see Kenora District, this volume). Rare metals of present commercial interest include tantalum, lithium and cesium, all of which may be present at Separation Lake. Pegmatites containing the distinctive mineral beryl had been known in the Separation Lake area since the 1930s, but it was not until 1993 that field work by the Ontario Geological Survey led to the recognition of the potential for other rare metals such as tantalum and lithium. Beryl occurs in a number of colours, but the pale mauve or blue varieties are particularly distinctive, hence their early discovery. On the other hand, lithium and tantalum bearing minerals such as petalite and tantalite are less easy to recognize, the former being white and similar in appearance to feldspar, and the latter black and commonly in very small grains. Some lithium minerals are coloured, such as the lithian mica lepidolite, which is a mauve colour, or the lithian amphibole, holmquistite, which is blue. Hence rare metal pegmatites present a particular exploration or prospecting challenge. Beryl in itself is of limited commercial interest, and until the discovery of other rare minerals at Separation Lake there had been little interest in the prospecting possibilities of the pegmatites there.

Storey (1990), in an evaluation of the industrial mineral potential of a large part of northwest Ontario, identified 28 pegmatite deposits, a number of which have the potential to be rare metal-bearing. The majority of them lie in the well known Dryden pegmatite belt, along the east trending boundary between the Wabigoon and Winnipeg River subprovinces, and close to Highway 17 between Kenora and Dryden. These have been well prospected and explored for rare metals. Others lie along the Winnipeg River-English River subprovincial boundary in the Separation Lake area, and are presently being investigated, or recommended for exploration by Hinz and Ravnaas (this volume). Others yet again lie close to the English River-Uchi subprovincial boundary, and mostly within the Red Lake Resident Geologist's District. These latter, between Pakwash Lake and Lake St. Joseph, have received little recent exploration and attention is brought to them here.

The most easily accessible identified pegmatite in the Pakwash-St. Joseph trend is the Sandy Creek pegmatite, which lies close to Highway 105 about 10 km north of Ear Falls. Beryl is the major known commodity, in association with dark blue-green apatite (Storey 1990). No other rare metal-bearing minerals have been identified, but Storey (1990) noted high lithium values in host rock to the pegmatite, close to the contact zone. Lithium anomalies in host rock can be used as an exploration or prospecting tool to find concentrations of lithium minerals in pegmatites, as can the visible presence of the blue mineral holmquistite in mafic metavolcanic rocks. Storey (1990) also describes the Cramp Lake pegmatite, beside the Wenasaga Forest access road. Although no rare metal minerals have been identified, he notes elevated lithium values in the pegmatite. Other pegmatites indicated but not visited by Storey, include the Massberyl pegmatite close to Whitemud Lake, the McCombe Lake and the Root Lake pegmatites west of Lake St Joseph, and the Pashkokogan Lake pegmatite. The McCombe and Root Lake pegmatites are reported to be lithium-bearing, and the Pashkokogan Lake pegmatite contains both beryl and tantalum. Pegmatites are common along the Pakwash-St. Joseph trend, and very little prospecting has been done in this area. There is a very good possibility for undiscovered rare metal bearing pegmatites to be present along this trend, and that some of them could contain commercial grade of metals such as tantalum, lithium or cesium. Even the deposits discussed above have received little attention, and deserve further exploration.

# OGS Activities and Research by Others

Locations of the following projects are shown in Figure 1, 2d and 2e.

Two projects were undertaken by the Ontario Geological Survey in Red Lake District in 1997. Both projects are an integral part of the NATMAP (National Mapping Program), a collaboration with the Geological Survey of Canada (Percival et al 1997).

- A) J.R. Devaney, Precambrian Geoscience Section, began sedimentological studies of the Birch Lake area (Devaney 1997). This project also supports LITHOPROBE (Western Superior Transect).
- B) D. Stone, Precambrian Geoscience Section, conducted regional mapping in the Sachigo, Stull and Yelling lakes areas, approximately 350 km north of Red Lake (Stone and Halle 1997).

Other studies include the following:

- C) W.F. Schwerdtner (University of Toronto) conducted a structural analysis at the Woman-Con federation assemblage boundary in the Birch-Confederation-Uchi lakes greenstone belt, with funding from LITHOPROBE (Western Superior Transect) and logistical support from the OGS (Schwerdtner et al 1997).
- D) C. Van Staal (Geological Survey of Canada) conducted a preliminary study of the Woman Lake area in preparation for more detailed structural and other studies in 1998. This study is an integral part of the NATMAP program, and supports LITHOPROBE (Western Superior Transect).
- E) T. Menard (University of Calgary) started a project to investigate the temporal relationship between metamorphism and mineralization processes in the Red Lake greenstone belt, with funding from LITHOPROBE (Western Superior Transect).

**Table 7.** Publications and other articles received by the Red Lake Office in 1997.

| Title   | Author   | Type and Year of Publication                                 |
|---|--|--|
| Report of Activities 1996, Resident Geologists  | Edited by J.W. Newsome and D. Laderoute  | Open File Report 5958, 1997                                  |
| Quaternary Geology of the Red Lake /Confederation Lake Area   | D.R. Sharpe and H.A.J. Russell   | GSC Open File 2876, 1996                                     |
| Precambrian Geology, Hemlo Gold Deposit Area  | T.L. Muir  | Report 289, 1997. Accompanied by maps 2602 to 2609, and 2629 |
| Geology of the Little Stull Lake Area (part of 53K 10)  | M.T. Corkery, T. Skulski, and J.B. Whalen  | Manitoba Minerals Division Preliminary Map 1997S-1, 1997     |
| Precambrian Geology, Sachigo Lake Area  | D. Stone, J. Halle and M. Lange  | Preliminary Map 3368, 1997                                   |
| Precambrian Geology, Little Sachigo Lake Area   | D. Stone, J. Halle and M. Lange  | Preliminary Map 3369, 1997                                   |
| Summary of Field Work and Other Activities, 1996  | Edited by C.L. Baker, P.C. Thurston, M.C. Gerow, C.A. Kaszycki, D.G. Laderoute, G. Merlino, J.W. Newsome, L. Owsiacki, G. Spiers and J.A. Fyon | Miscellaneous Paper 166, 1996                                |
| "Invisible" gold in sulfides from the Campbell mine, Red Lake greenstone belt, Ontario: evidence for mineralization during the peak of metamorphism | C.A. Tarnocai and K. Hattori   | The Canadian Mineralogist, Vol. 35, Pt. 4, p. 805-815, 1997  |
| Metamorphosed Archean epithermal Au-As-Sb-Zn-(Hg) vein mineralization at the Campbell mine, northwestern Ontario                                    | R.S. Penczak and R. Mason  | Economic Geology, Vol. 92, p. 696-719, 1997                  |

**Table 7.** cont'd. Publications and other articles received by the Red Lake Office in 1997.

| <b>Title</b>  | <b>Author</b>  | <b>Type and Year of Publication</b>                                     |
|---|--|---|
| Structural evolution of auriferous deformation zones at the Campbell mine, Red Lake greenstone belt, Superior Province of Canada    | G. Zhang, K. Hattori and A.R. Cruden                 | Precambrian Research, Vol. 84, p. 83-103, 1997                          |
| The petrological and metallogenic significance of the alkaline igneous centre at the Springpole Gold Prospect, northwestern Ontario | K.M. Barron  | Unpublished PhD. Thesis, University of Western Ontario, 272 pages, 1996 |
| Ontario Mining and Exploration Directory 1997   | Compiled by staff of Information Services            | 1997  |
| Directory 97: Ontario Dimension Stone Producers and Processors  | Compiled by staff of the Mineral Commodities Section | 1997  |

**Table 8.** Mineral deposits not being mined in the Red Lake District in 1997.

| <b>Abbreviations</b>   |                                  |   |                                 |   |               |
|--|----------------------------------|---|---------------------------------|---|---------------|
| AF   | Assessment Files                 | MLS   | Mining Lands, Sudbury           |   |               |
| CMH  | Canadian Mines Handbook          | MR  | Mining Recorder                 |   |               |
| GR   | Geological Report                | NM  | The Northern Miner              |   |               |
| MDC  | Mineral Deposit Circular         | OFR   | Open File Report                |   |               |
| MDIR   | Mineral Deposit Inventory record | PC  | Personal Communication          |   |               |
| <b>Deposit Name/<br/>NTS</b>   | <b>Commodity</b>                 | <b>Tonnage-Grade<br/>Estimates and/or<br/>Dimensions</b>  | <b>Ownership<br/>References</b> | <b>Reserve<br/>References</b>                       | <b>Status</b> |
| Abino<br>Bateman, Balmer and<br>Dome<br>Townships (52N/04SW)               | Au                               | Total Granodiorite Zone<br>drill indicated tonnage<br>405 162 tons 0.203 opt Au<br>from three sub-zones<br>(McClellan 1976)   | Goldcorp Inc.                   | AF  |               |
| Aiken-Russet<br>Baird Township<br>(52K/13NW)                               | Au                               | Total reserves of 102 555<br>tons of 0.22 opt Au  | Madsen Gold Corp.               | AF  |               |
| Alcourt (Copper Man,<br>Hanson-Campbell)<br>Fairlie Township<br>(52N/04SW) | Au                               | Reserves: 20 000 tons of<br>0.45 opt Au (Tilsley 1981)<br>from 1959-60 diamond<br>drilling.<br>No. 1 vein - 17 000 tonnes<br>of 0.2429 oz per tonne Au<br>(Tilsley 1981) from<br>1959-60 diamond drilling<br>and 1981 sampling pro-<br>gram | Unknown                         | AF  |               |
| Ancco Mine<br>Dome Township<br>(52N/04SW)                                  | Au                               | Reserves: 50 000 tons of<br>"Excellent Grade" (0.35<br>opt Au?)   | Unknown                         | OFR<br>Energy Mines and<br>Resources Canada<br>1989 |               |
| Bathurst Mine<br>Skinner Township<br>(52N/07SW)                            | Au                               | Reserves: 80 000 tons of<br>0.587 opt Au  | Unknown                         | Energy Mines and<br>Resources Canada<br>1989        |               |

**Table 8.** cont'd. Mineral deposits not being mined in the Red Lake District in 1997.

| Deposit Name/<br>NTS   | Commodity      | Tonnage-Grade<br>Estimates and/or<br>Dimensions  | Ownership<br>References                               | Reserve<br>References   | Status |
|--|----------------|--|---|---|--------|
| Berens River Mine<br>(Golsil, Zahavy)<br>(53C/13SE)                          | Au, Ag, Pb, Zn | Reserves: No. 1 Zone -<br>75 000 tons of 0.1 - 0.2<br>opt Au, 4.0 - 5.0 opt Ag.<br>No. 3 Zone - 982 213 tons<br>0.26 opt Au, 4.8 opt Ag,<br>0.77% Pb, 1.12% Zn (713<br>249 tons indicated,<br>268 964 tons inferred) at<br>0.15 opt Au cut-off to 750<br>metre level | Xavier Mines Ltd.                                     | MDIR<br>AF - (Bevan, 1983)  |        |
| Bluffy Lake (52K/14SE)   | Fe             | Reserves: 21 000 000 tons<br>at 22.86% Fe  | Unknown   | Prelim. Map P.1199  |        |
| Borland Lake<br>(53D/16NE)   | Ag, Au         | Probable Reserves:<br>502 412 tons of 8.09 opt<br>Ag and 0.02 opt Au   | Unknown   | Massive Resources<br>Ltd. Preliminary Pro-<br>spectus - August 6,<br>1987 |        |
| Buffalo Red Lake<br>Heyson Township<br>(52N/04SW)                            | Au             | Reserves: 421 728 tonnes<br>of 0.139 opt Au drill indi-<br>cated in 1980   | Madsen Gold Corp.                                     | MDIR  |        |
| Cochenour Willans Mine<br>Dome Township<br>(52N/04SW)                        | Au             | Reserves: Proven and<br>probable 173 000 tons of<br>0.51 opt Au possible re-<br>serves 274 000 tons of<br>0.59 opt Au  | Wilanour Re-<br>sources Ltd.                          | NM - Dec. 12, 1994<br>p.7   |        |
| Cole Gold Mine<br>Ball Township<br>(52M/01SE)                                | Au             | Reserves: 119 780 tons of<br>0.41 opt Au probable and<br>indicated (Wilton, 1973)  | Unknown   | AF  |        |
| Consolidated Marcus<br>Dome Township<br>(52N/04SW)                           | Au             | Reserves: 60 000 tons of<br>0.18 opt Au  | Unknown   | Energy Mines and<br>Resources Canada<br>1989                              |        |
| Copper Lode A -<br>Rexdale Group Prospect<br>Belanger Township<br>(52K/15NW) | Cu, Ag         | Reserves: 236 424 tons of<br>1.94% Cu, 1.22 opt Ag<br>or 425 612 tons of<br>1.56% Cu, 0.98 opt Ag<br>or 854 007 tons of<br>1.01% Cu, 0.57 opt Ag   | Unknown   | AF<br>MP159   |        |
| Copper-Lode D<br>Belanger Township<br>(52K/15NW)                             | Cu, Zn         | Reserves: 36 000 tons of<br>0.26% Cu, 7.58% Zn   | Noranda Mining<br>and Exploration<br>Inc.             | AF  |        |
| Copper-Lode E<br>Belanger Township<br>(52K/15NW)                             | Cu, Ag         | Reserves: 104 586 tons<br>7.39% Zn, 0.98% Cu, 0.62<br>opt Ag<br>or 276 012 tons<br>4.80% Zn, 0.66% Cu, 0.39<br>opt Ag<br>or 338 257 tons<br>4.36% Zn, 0.60% Cu, 0.40<br>opt Ag   | Noranda Mining<br>and Exploration<br>Inc.             | AF<br>MP159   |        |
| Dixie Creek<br>(52K/13SE)  | Au             | Reserves: 500 000 tons of<br>0.12 opt Au   | Dennis Smith, Wil-<br>liam McNerney<br>and Associates | AF, MDIR<br>Vancouver<br>StockWatch - July 2,<br>1991                     |        |
| Dixie 3 Prospect<br>(52K/14NW)   | Cu, Zn         | Reserves: 88 000 tons of<br>14.8% Zn and 150 000<br>tons of 10% combined Cu<br>and Zn  | Noranda Mining<br>and Exploration<br>Inc.             | MP161<br>AF   |        |

**Table 8.** cont'd. Mineral deposits not being mined in the Red Lake District in 1997.

| Deposit Name/<br>NTS   | Commodity | Tonnage-Grade<br>Estimates and/or<br>Dimensions   | Ownership<br>References                | Reserve<br>References   | Status |
|--|-----------|---|--|---|--------|
| Dixie 18 Prospect<br>(52K/14NW)                                      | Zn        | Reserves: 150 000 tons of<br>14% Zn   | Noranda Mining<br>and Exploration Inc. | MP161   |        |
| Grassett Prospect<br>Earngey Township<br>(52N/02SE)                  | Au        | Reserves: 78 295 tons of<br>0.22 opt Au   | Lac Properties Inc.                    | Energy Mines and<br>Resources Canada<br>1989  |        |
| Griffith Mine<br>(52K/14SW)  | Fe        | Reserves: 120 000 000<br>tons of 29% Fe   | Unknown                                | GR82  |        |
| Hasaga Mine<br>Heyson Township<br>(52N/04SW)                         | Au        | Reserves: C Block (below<br>1800 feet) 200 203 tons of<br>0.192 opt Au.<br>Stopes – 41 430 tons of<br>0.104 opt Au<br>Pillars - 6 365 tons of<br>0.134 opt Au | Lac Properties Inc.                    | GR56  |        |
| Hill-Sloan-Tivy<br>Earngey Township<br>(52N/02SE)                    | Au        | Reserves: 296 000 tons of<br>0.219 opt Au   | Unknown                                | AF  |        |
| Horseshoe Island<br>(52N/08NW)                                       | Au        | Reserves: 893 508 tons of<br>0.14 opt Au  | Unknown                                | Northwest Prospec-<br>tor, March/April<br>1990, p.27  |        |
| Howey Mine<br>Heyson Township<br>(52N/04SW)                          | Au        | Reserves: 780 000 tons of<br>0.08 opt Au  | Teck Corporation                       | Energy Mines and<br>Resources Canada<br>1989  |        |
| Jackson-Manion Mine<br>Dent Township<br>(52N/02SE)                   | Au        | Reserves: 40 000 tons of<br>0.5 opt Au  | Unknown                                | NM - March 14,<br>1985, p.21  |        |
| Joy - New Zone<br>(Diamond Willow Zone,<br>Creek Zone)<br>(52K/14NW) | Cu, Zn    | Reserves: 300 000 tons of<br>4% combined Cu-Zn  | Noranda Mining<br>and Exploration Inc. | AF  |        |
| Kesaka Lake<br>(52K/16NW)  | Fe        | Reserves: 312 500 000<br>tons of 31.1% Fe to a<br>depth of 100 feet   | Unknown                                | ODM Annual report<br>Vol. 48, pt. 8, p.<br>1-43   |        |
| Laverty (Thrall)<br>Heyson Township<br>(52N/04SW)                    | Au        | Reserves: Speculative<br>reserves from the Diabase<br>dike zone: 329 000 tons<br>of 0.08 opt Au or 75 000<br>tons of 0.15 opt Au                              | Unknown                                | AF  |        |
| Lingman Lake<br>(53F/15SW)   | Au        | Reserves: 1 172 753 tons<br>of 0.20 opt Au in all zones<br>at 5.0 foot minimum width<br>and a cut-off grade of 0.08<br>opt Au (McPhee, 1989)                  | Unknown                                | AF  |        |
| May-Spiers<br>Ball Township<br>(52M/01SE)                            | Au        | Reserves: 30 000 tons of<br>0.09 opt Au   | Unknown                                | AF  |        |
| McCombe<br>(Root Lake)<br>(52J/13NE)                                 | Lithia    | Reserves: 2.3 million tons<br>of 1.3% Lithia to the 500<br>foot level   | Unknown                                | MP90  |        |
| McFinley Mine<br>Bateman Township<br>(52N/04SE)                      | Au        | Reserves: 890 000 tons of<br>0.19 opt Au  | McFinley Red Lake<br>Mines Ltd.        | Energy Mines and<br>Resources Canada<br>1989; Mines and<br>Resources Canada<br>Mineral Bulletin<br>MR 223 |        |

**Table 8.** cont'd. Mineral deposits not being mined in the Red Lake District in 1997.

| Deposit Name/<br>NTS  | Commodity        | Tonnage-Grade<br>Estimates and/or<br>Dimensions  | Ownership<br>References               | Reserve<br>References  | Status |
|---|------------------|--|---------------------------------------|--|--------|
| Mount Jamie<br>Todd Township<br>(52M/01SE)  | Au               | Reserves: Main Zone -<br>47 048 tons of 0.425 opt<br>Au<br>No. 2 Shaft area - 25 360<br>tons of 0.37 opt Au  | Madsen Gold Corp.                     | AF   |        |
| My-Ritt (Coin Lake)   | Au               | Unknown  | My-Ritt Red Lake<br>Gold Mines Ltd.   | OFR 5558   |        |
| New Faulkenham Mines<br>Ltd.<br>(Faulkenham Lake)<br>Baird Township<br>(52K/13NW) | Au               | Reserves: 15 000 tons of<br>0.428 opt Au (\$15.00 at<br>\$35.00 per ounce Au -<br>Holbrooke, 1958)   | Unknown                               | AF   |        |
| North Spirit Lake<br>(Crown Trust)<br>(53C/07NW)                                  | Fe               | Reserves: 1.3 million tons<br>per vertical foot of 33.94%<br>Fe  | Unknown                               | ODM Annual<br>Report Vol.47, Pt. 7,<br>p.44-78<br>GR150                  |        |
| Northgate Prospect<br>Earngey Township<br>(52N/02SE)                              | Au               | Reserves: 64 600 tons of<br>0.28 opt Au  | Unknown                               | AF   |        |
| Ogani Lake<br>(52K/15NE)  | Fe               | Reserves: 100 000 000<br>tons of 21.6% Fe  | Unknown                               | AF   |        |
| Papaonga Lake<br>(52K/16NE)   | Fe               | Reserves: 13 500 000 tons<br>of 31.06% Fe  | Unknown                               | MDIR   |        |
| Red Crest (Red Summit)<br>Todd Township<br>(52M/01SE)                             | Au               | Reserves: 47 439 tons of<br>0.269 opt Au (uncut grade)<br>- Horwood, 1945<br>38 000 of 0.3 opt Au  | Unknown                               | NM - March 14,<br>1985,p.21<br>DoM Annual Report<br>vol. 49, pt. 2, 1940 |        |
| Redaurum<br>Baird Township<br>(52N/04SW)  | Au               | Possible Reserves:<br>14A Zone - 243 750 tons<br>of 0.22 opt Au<br>and 26 250 tons<br>of 0.20 opt Au<br>No. 2 Zone - 137 500 tons<br>of 0.18 opt Au<br>No. 3 Zone - 102 500 tons<br>of 0.18 opt Au<br>Camp Zone - 24 750 tons<br>of 0.13 pt Au | Redaurum Ltd.                         | AF   |        |
| Richardson<br>(Kostynuk Bros. Mine)<br>(52N/09SW)                                 | Au               | Reserves: 700 000 tons of<br>0.2 opt Au inferred re-<br>serves   | Unknown                               | OFR 5835   |        |
| Rowan<br>Todd Township<br>(52M/01SE)  | Au               | Reserves: 10 900 tons of<br>0.657 opt Au (\$23.00 a ton<br>at \$35.00 per ounce)   | Goldcorp Inc.                         | AF   |        |
| Sanshaw<br>(Whitehorse Island)<br>Dome Township<br>(52N/04SW)                     | Au               | Reserves: 175 000 tons of<br>0.20 opt Au   | Bonanza Red Lake<br>Explorations Inc. | NM - June 11, 1953   |        |
| Setting Net Lake<br>(53C/13SE)  | MoS <sub>2</sub> | Reserves: 100 000 000<br>tons of 0.09% MoS <sub>2</sub>  | Unknown                               | MDIR<br>NM - March 23,<br>1973   |        |
| Sol-D'Or<br>Honeywell Township<br>(52N/07SE)                                      | Au               | Reserves: 8 565 tons of<br>0.57 opt Au   | R. Knappett                           | Energy Mines and<br>Resources Canada<br>1989                             |        |

**Table 8.** cont'd. Mineral deposits not being mined in the Red Lake District in 1997.

| Deposit Name/<br>NTS                                      | Commodity             | Tonnage-Grade<br>Estimates and/or<br>Dimensions  | Ownership<br>References         | Reserve<br>References                                    | Status |
|---|-----------------------|--|---------------------------------|--|--------|
| Springpole Lake<br>Prospect (52N/08NW)                    | Au                    | Reserves: Portage Zone -<br>7.9 million tons of 0.07 opt<br>Au<br>27 million tons of 0.035<br>opt Au including 4 million<br>tons of 0.091 opt Au and<br>405 000 tons of 0.14 opt<br>Au   | Gold Canyon Re-<br>sources Inc. | OFr 5835   |        |
| Starratt-Olsen Mine<br>Baird Township<br>(52K/13NW)       | Au                    | Reserves: 15 000 of 0.45<br>opt Au   | Madsen Gold Corp.               | NM - July 26, 1973<br>MDIR                               |        |
| Trout Bay Zinc Pit Zone<br>Mulcahy Township<br>(52M/01SE) | Zn, Cu, Pb, Ag,<br>Au | Reserves: West Zone -<br>13 776 tons of 4.75% Zn,<br>0.68% Cu, 0.94 opt Ag<br>East Zone - 124 760<br>tons 7.86% Zn, 1.5% Cu,<br>0.24% Pb, 1.7 opt Ag,<br>0.007 opt Au  | Unknown                         | MP147<br>Preliminary Map<br>P.567<br>MDIR                |        |
| Uchi Mine<br>Earngey Township<br>(52N/02SE)               | Au                    | Reserves: 214 000 tons of<br>0.147 opt Au  | Lac Properties Inc.             | Energy Mines and<br>Resources Canada<br>1989             |        |
| Wilmar Mine<br>Dome Township<br>(52N/04SW)                | Au                    | Reserves: Quoted from<br>Durocher et al 1987 unless<br>indicated otherwise<br><br>Diorite Dike Zone -<br>140 000 tone of 0.21 opt<br>Au<br>East Breccia Zone -<br>31 500 tons of opt Au<br>(Proven)<br>- 50 500 tons of 0.25 opt<br>Au (Probable) -<br>1 777 000 tons of 0.24 opt<br>Au (Possible)<br>Carbonate Zone - 25 000<br>tons of 0.17 opt Au<br>(Probable)<br>- 7 500 tons of 0.15 opt<br>Au (Possible)<br>West Granodiorite Zone -<br>3.15 to 4.5 million tons of<br>0.076 to 0.131 opt Au<br>(EMR Canada, 1989)<br>Granodiorite Zone -<br>5 700 000 tons of 0.10 to<br>0.15 opt Au | Unknown                         | OFr 5558<br>Energy Mines and<br>Resources Canada<br>1989 |        |
| Woco Vein<br>Earngey Township<br>(52N/02SE)               | Au                    | Reserves: 21 263 tons of<br>0.80 opt Au  | Unknown                         | AF   |        |
| Young, H.G. Mines Ltd.<br>Balmer Township<br>(52N/04SW)   | Au                    | Reserves: 270 000 tons of<br>0.31 opt Au   | Placer Dome North<br>America    | OFr 5558   |        |

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**ONTARIO GEOLOGICAL SURVEY  
Resident Geologist Program - 1997**

**Kenora Resident Geologist's District  
by**

**Hinz, P., Ravnaas, C.B.**

**1998**

# Kenora District–1997

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## Introduction

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Dimension, monument and decorative stone continued to be produced and marketed in the Kenora District in 1997, from 5 quarries. No metallic mineral production was recorded in the District. Advanced exploration was initiated at a past producing cobalt mine, while underground exploration programs of developed gold reserves, at Shoal Lake and Cameron Lake, remained inactive.

The level of exploration activity on Crown Land in the Kenora District showed only a small increase during 1997. This slowed a trend of increasing activity over the previous 5 years, as indicated in Table 1. The number of claims active showed a 10% increase from 1996. Statistics for total work performed, measured as dollar expenditures, was not available for 1997. The actual number of companies and individuals conducting exploration, as indicated in Table 3, was lower by 23 than in 1996, when 56 projects were conducted. Nine projects, itemized in Table 3, were conducted with financial assistance from the Ontario Prospectors Assistance Program (OPAP), using 14 grants totalling \$133,978.

**Table 1.** Summary of claims recorded and assessment work credits in the Kenora District, 1991-1997

| Year | Claim Units Recorded | Claim Units Cancelled | Claim Units Active | Diamond Drilling (\$) | Physical Work (\$) | Geotechnical Work *(\$) | Total(\$) |
|------|----------------------|-----------------------|--------------------|-----------------------|--------------------|-------------------------|-----------|
| 1997 | 3 536                | 2 402                 | 14 102             |                       |                    |                         |           |
| 1996 | 6 011                | 2 283                 | 12 968             | 964 232               | 644 436            | 371 770                 | 2 067 454 |
| 1995 | 2 222                | 2 798                 | 9 240              | 473 317               | 110 872            | 300 143                 | 884 584   |
| 1994 | 2 946                | 3 173                 | 9 823              | 529 825               | 64 718             | 521 086                 | 1 115 629 |
| 1993 | 1 193                | 1 825                 | 9 844              | 80 797                | 631 632            | 606 588                 | 1 319 017 |
| 1992 | 3 124                | 1 278                 | 10 139             | 657 218               | 202 950            | 174 598                 | 1 034 766 |
| 1991 | 1 678                | 2 816                 | 8 293              | 591 497               | 163 560            | 72 122                  | 987 196   |

\*As of 1992, Geological and Geophysical Survey data are combined as Geotechnical Work

Three geoscience projects were conducted in the district by staff of the Mines and Minerals Division. Staff of the Kenora Office made and documented 6 visits to active and inactive mineral properties. These visits resulted in discussion of 2 properties in this report, along with broader recommendations for prospecting and exploration.

# Mining and Quarrying Activity

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There was no major production of either base or precious metals in the Kenora District in 1997. There was a marked increase in the number of granite quarries, which are keyed, with letters in parentheses, to Figure 1.

## DIMENSION AND MONUMENT STONE

**Nelson Granite Ltd.** (a division of Granite Monuments Ltd.) (A) operated three stone quarries in the Kenora District during 1997. Production continued at the Docker Township quarry, 10 km southwest of Vermilion Bay. A homogenous, medium-grained pink granite is produced from a granite plug, which is part of the Dryberry batholith. Fracturing is negligible, allowing for removal of blocks of virtually any size. The majority of the stone produced, which is sold as Vermilion Pink, is used in the monument industry. In 1997, approximately 5 663 m<sup>3</sup> (200 000 cubic feet) was produced (N. Nelson, Nelson Granite Ltd., personal communication, 1998)

**Nelson Granite Ltd.** (B) continued production at their Red Deer Lake quarry in 1997. The quarry is located on the north shore of Red Deer Lake, approximately 40 km northeast of Kenora and 15 km northwest of the railway stop of Jones. A total of 708 m<sup>3</sup> (25 000 cubic feet) was produced for use as monument and building stone. The stone is marketed as Red Deer Brown and was sold primarily to clients in North America (N. Nelson, Nelson Granite Ltd., personal communication, 1998). The stone is reddish-brown and is composed of pink potassium feldspar phenocrysts in a fine- to medium-grained matrix of potassium and plagioclase feldspars, quartz and biotite. The granite formation is part of the Lount Lake batholith and is very massive with few, widely spaced, vertical fractures. Sheeting or horizontal fracturing is spaced from 1 to 5 m and greater, allowing for extraction of large blocks (Hinz, Landry and Gerow 1994).

**Nelson Granite Ltd.** (C) started production at their Forgotten Lake quarry in 1997. The quarry is located on the west shore of Forgotten Lake, approximately 35 km north of Kenora and 10 km north of Redditt. A total of 708 m<sup>3</sup> (25 000 cubic feet) (N. Nelson, Nelson Granite Ltd., personal communication, 1998) was produced under the market name of Ocean Green. The stone is a medium- to coarse-grained, prophyritic granite composed of yellow, potassic feldspar phenocrysts in a matrix of potassium and plagioclase feldspar, quartz and biotite. The granite is part of the Lount Lake batholith and contains very few fractures. The joints are spaced 2 to 3 m apart and sheeting is 1 to 2 m at the surface (Hinz, Landry and Gerow, 1994).

**Palin Granite Canada Inc.** (a division of Palin Granite Oy, Finland) (D) resumed quarrying operations, in fall 1997, on their Pine Green granite quarry. The quarry is located approximately 38 km north-northeast of Kenora. A total of 863 m<sup>3</sup> (30 471 cubic feet) of green granite was produced for sale to clients in China, Canada and the United States (T. Hendrickson, Palin Granite Canada Inc., personal communication, 1998). The quarry can produce two colours, a green megacrystic granite marketed as “Pine Green”, and a yellow megacrystic granite sold as “Crystal Gold”. The granite, which is part of the Lount Lake batholith, is yellow at the surface (i.e. 60 cm to 6 m depth) while below this the colour changes to green. Jointing and sheeting is widely spaced and allows for the removal of blocks of virtually any size.

**Cold Spring Granite Corp.** (E) started production on their Havik Lake granite quarry in mid-1997. The site is located approximately 34 km north-northeast of Kenora on the Jones Road. The quarry produced 283 m<sup>3</sup> (10 000 cubic feet) of reddish brown, prophyritic granite which is sold under the name of “Royal Auburn”. All production was shipped to the parent company in Cold Spring, Minnesota (E. Charles, Cold Spring Granite Canada Ltd., personal communication, 1998). The quarry is hosted in a massive granite body, which is part of the Lount Lake batholith. It contains few vertical or horizontal fractures, which allows for the extraction of large blocks.

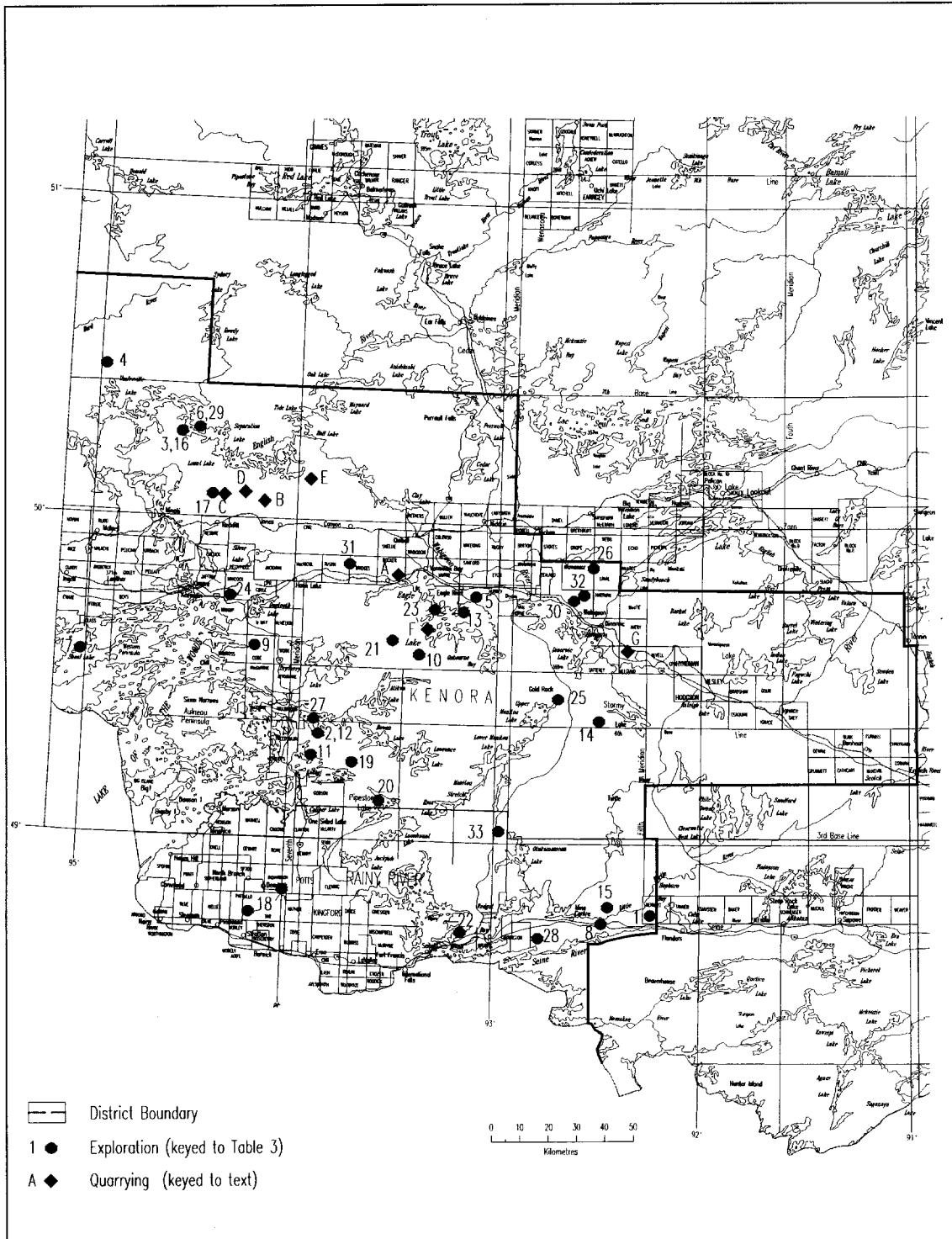


Figure 1. Kenora District, exploration and quarrying activity, 1997.

## DECORATIVE STONE

**Labyrinth Bay Stoneworks (F)** removed approximately 60 tons of soapstone, by barge, from their Eagle Lake quarry. The quarry is located on the southeast shore of Eagle Lake, approximately 38 km east-southeast of Dryden. The soapstone is currently being sold to a number of co-operatives and communities in the eastern Arctic, part of the Nunavut Territory (P. Thorgrimson, Labyrinth Bay Stoneworks, personal communication, 1997).

## RAILWAY BALLAST

**Broda Construction Inc. (G)** of Kamsack, Saskatchewan did not produce any additional railway ballast for Canadian Pacific Railways from C.P.R.'s ballast quarry near Dyment, 42 km southeast of Dryden. Material was shipped from the stockpile for use by C.P.R. on their rail lines between Alberta and Quebec. (C. Broda, Broda Construction Inc., personal communication, 1997).

**Table 2.** Assessment files received in the Kenora District Office in 1997.

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

| Township or Area        | Company Name                 | Year    | Type of Work | AFRO Number | Resident Geologist Office File Designation |       |
|-------------------------|------------------------------|---------|--------------|-------------|--|-------|
| Aubrey Township         | Champion Bear Resources Ltd. | 1995    | DD, Samp     | 2.17449     | 52F/14 SE                                  | E-3   |
| Bad Vermilion Lake Area | Cone, Russel                 | 1953    | GL           | -           | 52C/10 NE                                  | C-7   |
| Bad Vermilion Lake Area | Corporate Oil & Gas Limited  | 1979    | GR           | -           | 52C/10 NE                                  | X-1   |
| Bad Vermilion Lake Area | Golden Star Mine             | 1974-90 | GL, GM, Samp | -           | 52C/10 NE                                  | S-1   |
| Bad Vermilion Lake Area | McCormick, Alan              | 1992    | DD, Samp     | -           | 52C/10 NE                                  | TT-6  |
| Bad Vermilion Lake Area | Stephana Resources Ltd.      | 1997    | GEM, GM      | 2.17626     | 52C/10 NE                                  | GGG-1 |
| Bennett Lake Area       | Cousineau, Louis             | 1996    | Tr, Samp     | 2.17085     | 52C/16 SW                                  | AA-8  |
| Bennett Lake Area       | Minescape Exploration Inc.   | 1996    | AEM, AM      | 2.17662     | 52C/16 SW                                  | BB-1  |
| Bigstone Bay Area       | Roberecki, Anna Marie        | 1997    | Tr, Samp     | 2.17668     | 52E/09 NW                                  | -7    |

**Table 2.** cont'd. Assessment files received in the Kenora District Office in 1997.

| Township or Area                      | Company Name                               | Year    | Type of Work          | AFRO Number | Resident Geologist Office File Designation |
|---------------------------------------|--|---------|-----------------------|-------------|--|
| Bluffpoint Lake Area                  | Tri Origin Exploration Ltd.                | 1996    | GL, Samp              | 2.17930     | 52F/03 NW W-4                              |
| Boyer Lake Area                       | Chute, Michael E.                          | 1995    | GL, Samp              | 2.16995     | 52F/04 NE Z-3                              |
| Boyer Lake Area                       | Redden, J.W.                               | 1997    | GM                    | 2.17635     | 52F/07 NE BBB-18                           |
| Buchan Bay Area                       | Hames, C. Marshall                         | 1989    | DD, GL                | -           | 52F/11 NE Z-7                              |
| Buchan Bay Area                       | International Precious Metals Corp.        | 1997    | DD, Samp              | 2.17395     | 52F/11 NE MM-2                             |
| Clearwater Bay Area                   | Academy Explorations Ltd.                  | 1983    | DD, Samp              | -           | 52E/10 NE HH-1                             |
| Clearwater Bay Area                   | Gold Hill Resources Inc.                   | 1985    | GL                    | -           | 52E/10 NE DD-3                             |
| Contact Bay Area                      | Comstate Resources                         | 1987    | Samp                  | -           | 52F/10 NW C-1                              |
| Docker Township                       | Nelson, Carter                             | 1996    | DD                    | 2.17448     | 52F/13 SE N-8                              |
| Dogpaw Lake Area                      | Avalon Ventures Ltd.                       | 1997    | GM, Lc                | 2.17534     | 52F/05 SW FFFF-1                           |
| Dogpaw Lake Area                      | Twomey, Timothy J.                         | 1996    | GL, GC, Str, Samp     | 2.17087     | 52F/05 SW DDDD-2                           |
| Eagle Rock Lake Area                  | BP Resources Canada Ltd.                   | 1988    | GL                    | -           | 52F/02 NE C-3                              |
| Ewart Township                        | Eco Exploration Ltd.                       | 1985    | IP                    | -           | 52E/11 NE AAA-1                            |
| Forgotten Lake Area                   | Nelson, Carter                             | 1996    | Str, IM               | 2.16954     | 52L/01 SW E-7                              |
| Forgotten Lake Area                   | Palin Granite Canada Inc.                  | 1996    | Str, DD               | -           | 52L/01 SW G-5                              |
| Haycock Township                      | Boise Cascade Canada Ltd.                  | 1985-89 | GL, GEM, GM, IP       | -           | 52E/16 SW BB-7                             |
| Haycock Township                      | Raoul, A. & McMunn, K.                     | 1995-96 | GL, Pr, Str, Samp     | 2.16967     | 52E/09 NW D-1                              |
| Haycock Township                      | Raoul, Allen                               | 1996    | GEM, GM, Pr, Samp     | 2.17028     | 52E/09 NW D-2                              |
| Jaffray Township                      | Tolko Industries Ltd.                      | 1995    | Tr                    | 2.16953     | 52E/16 SW OO-1                             |
| Kirkup Township                       | Ennis, G.F.                                | 1972    | GR                    | -           | 52E/09 NW E-1                              |
| Little Turtle Lake Area               | Cousineau, Louis Edward                    | 1996    | DD                    | 2.17320     | 52C/15 SE PP-5                             |
| Little Turtle Lake Area               | Ludwig, E.                                 | 1991    | GR                    | -           | 52C/15 SE QQ-1                             |
| Manross Township                      | Willis, James H.                           | 1996    | Pr, GC, Str, Tr       | 2.17018     | 52E/09 SW V-1                              |
| Manross Township                      | Willis, James H.                           | 1996    | Pr, GM, Str, Tr       | 2.17192     | 52E/09 SW V-2                              |
| Meggisi Lake Area                     | Webster, Blaine                            | 1996    | GL, GC, Samp          | 2.17181     | 52F/07 SE B-6                              |
| Meggisi Lake Area                     | Webster, Blaine                            | 1996    | GL, GC, Samp          | 2.17107     | 52F/07 SE B-7                              |
| Meggisi Lake Area                     | Webster, Blaine                            | 1996    | GEM, GM, Lc           | 2.16968     | 52F/07 SE B-2                              |
| Meggisi Lake Area                     | Webster, Blaine                            | 1996    | GEM, GM, Lc           | 2.16996     | 52F/07 SE B-3                              |
| Meggisi Lake Area                     | Webster, Blaine                            | 1996    | GL, GC, Samp          | 2.17123     | 52F/07 SE B-5                              |
| Paterson Lake Area                    | Tantalum Mining Corporation Of Canada Ltd. | 1996    | DD, Samp              | 2.17086     | 52L/07 SE Q-1                              |
| Paterson Lake Area                    | Thorgrimson, Phillip E                     | 1997    | Pr, Samp              | 2.17191     | 52L/07 SE P-2                              |
| Pattullo Township                     | Nuinsco Resources Ltd.                     | 1997    | OD                    | 2.17679     | 52D/16 SE E-8                              |
| Pattullo Township                     | Nuinsco Resources Ltd.                     | 1997    | Samp                  | 2.17925     | 52D/16 SE E-9                              |
| Pattullo, Tait, Pratt, Blue Townships | Nuinsco Resources Ltd.                     | 1995    | OD, Samp              | -           | 52D/16 SE E-6                              |
| Raynar Lake Area                      | Ferreira, William S.                       | 1995-96 | DD, GM, Samp          | 2.16961     | 52L/06 NE W-2                              |
| Rex Lake Area                         | Ferreira, William S.                       | 1995    | DD, Samp              | 2.17204     | 52L/07 NE L-4                              |
| Rex Lake Area                         | Ferreira, William S.                       | 1997    | DD, Lc, GEM, GM, Samp | 2.17656     | 52L/07 NE L-5                              |

**Table 2.** cont'd. Assessment files received in the Kenora District Office in 1997.

| <b>Township or Area</b>         | <b>Company Name</b>                     | <b>Year</b> | <b>Type of Work</b> | <b>AFRO Number</b> | <b>Resident Geologist Office<br/>File Designation</b> |       |
|---------------------------------|---|-------------|---------------------|--------------------|---|-------|
| Richardson Township             | Nuinsco Resources Ltd.                  | 1996        | DD, Samp            | -                  | 52D/16 SE   | E-5   |
| Richardson, Pattullo, Tait Area | Nuinsco Resources Ltd.                  | 1996        | OD, Samp            | -                  | 52D/16 SE   | E-7   |
| Richardson, Pattullo, Tait Area | Nuinsco Resources Ltd.                  | 1997        | GL                  | -                  | 52D/16 SE   | E-10  |
| Rowan Lake Area                 | Nuinsco Resources Ltd.                  | 1996        | DD                  | 2.17444            | 52F/05 SE   | JJ-21 |
| Sand Lake Area                  | Nelson, Carter                          | 1995        | DD, Str             | 2.17190            | 52L/02 SE   | K-1   |
| Snowshoe Bay Area               | Duport Mining Company Ltd.              | 1973        | DD                  | -                  | 52E/11 SE   | D-2   |
| Swan Lake Area                  | Minor, J.A.                             | 1992-93     | IM                  | -                  | 52L/02 SW   | C-3   |
| Tabor Lake Area                 | Redden, J.W                             | 1990        | GL                  | -                  | 52F/09 SW   | XX-18 |
| Treelined Lake Area             | Champion Bear Res. Ltd.                 | 1997        | GL, Samp            | 2.17842            | 52L/08 NW   | K-7   |
| Watten Township                 | Phelps Dodge Corporation<br>Canada Ltd. | 1997        | DD                  | 2.17838            | 52C/11 NE   | Z-5   |
| Wiley Bay Area                  | Midnapore 1979 Resources<br>Inc         | 1986-89     | DD, GEM, Samp       | -                  | 52E/10 SE   | U-3   |
| Wiley Bay Area                  | Mountain Lake Resources Inc.            | 1986        | GM,GC               | -                  | 52E/10 SE   | Q-3   |
| Wonderland Lake Area            | Manex Granit Inc.                       | 1996        | IM                  | 2.16984            | 52L/01 SE   | F-4   |
| Zealand Township                | Teck Explorations Ltd.                  | 1996        | DD, Samp            | 2.17396            | 52F/15 SE   | Y-10  |

# Advanced Exploration and Development

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The following is keyed with a number in parenthesis to Figure 1 and Table 3.

**Canmine Resources Ltd.** (4) and joint-venture partner Red Engine Resources continued advanced exploration work at their Werner Lake Cobalt project. Canmine and Red Engine hold patented and staked ground over a strike length of 32 km. Within the ground package are the past-producing Werner Lake cobalt mine and Gordon Lake nickel-copper mine. The Werner Lake cobalt mine produced between 1940 and 1945. The Gordon Lake Mine operated between 1962 and 1972. In 1996 Canmine had outlined six cobalt-mineralized zones over a strike length of 6 km. Work on the property included construction of a ramp to access the deposit in order to facilitate bulk sampling, metallurgical testing, diamond drilling and down-hole pulse-EM geophysical survey (T. Elwood, Canmine Resources Corp., personal communication, 1998)

In early 1997 Canmine initiated development of a 790 m (2600 foot) ramp. By year-end the ramp had reached 145 m in length with a drift 75.3 m long to the east and 31.2 m long to the west. In addition a 6.7 m raise was driven in the east drift. (T. Elwood, Canmine Resources Corp., personal communication, 1998). During the underground development, high-grade pockets of cobalt mineralization were encountered and sampled. Chip samples across the ore face returned values as high as 20% Co over 1.8m. The high-grade sections dip vertically and plunge at 45° east (*Canada NewsWire*, October 22, 1997). The copper-cobalt zone is hosted within a coarse-grained, garnet-biotite schist and interlayered amphibolite, mafic gneiss and a calc-silicate rock composed of calcite, diopside and epidote. Pyrite, chalcopyrite and cobalt are contained within the calc-silicate rock (Blackburn and Hinz, 1997).

A total of 10 000 tonnes were extracted during the underground development work and trucked to the pilot mill at the Maskwa mine site in Manitoba. The company received an Order-in-Council under the Ontario Mining Act permitting the shipment of cobalt concentrate to purchasers outside of Canada. They also received an Environmental Act Licence from the Manitoba Ministry of Environment for the construction and operation of a cobalt test milling facility. At the time of writing no material had been milled, pending the outcome of an engineering study to design a pressure leach autoclave unit as a secondary circuit in the mill (*Canada Stockwatch*, December 22, 1997).



# Exploration Activity

A complete summary of exploration activity, including prospecting, is given in Table 3. Gold and rare-metal pegmatites were the predominant targets. Described below are programs with significant exploration expenditures and/or known results. Where a number of commodities were targeted or discovered, projects are described according to the predominant commodity targeted. No base metal programs are discussed because those conducted by Nuinsco Resources Ltd. on their 34 zone and Phelps Dodge Corporation of Canada Ltd. at their Dash Lake property did not yield significant results. Exploration information included in this section is taken from the assessment files in the Kenora Resident Geologist's office, unless otherwise indicated. Programs are keyed with numbers in parentheses to Table 3 and Figure 1.

**Table 3.** Exploration activity in the Kenora District in 1997

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

| <b>No</b> | <b>Company/Individual (Occurrence Name) or Property</b> | <b>Township/Area (Commodity)</b>     | <b>Exploration Activity (Incentive Program)</b> |
|-----------|---|--------------------------------------|---|
| 1         | Angove, R   | Bennett Township (Au)                | Pr, DD, Samp., GM, Lc, HLEM, (OPAP)             |
| 2         | Avalon Ventures Ltd. (Dubenski property)                | Dogpaw Lake area (Au)                | Pr, DD, Str., Samp., GM, GC, GL, Lc             |
| 3         | Avalon Ventures Ltd. (Separation Rapids pegmatite)      | Paterson Lake area (Li, Ta, Cs, Rb)  | DD, GL, GM, Str., Samp., Lc, Pr                 |
| 4         | Canmine Resources                                       | Werner Lake Area (Co)                | Bulk, DD, Met, UG, DGP                          |
| 5         | Champion Bear Resources (Plomp Farm property)           | Aubrey Township (Au)                 | DD  |
| 6         | Champion Bear Resources (Separation Rapids pegmatite)   | Treelined Lake area (Li, Ta, Cs, Rb) | GL, GC, DD                                      |

**Table 3.** cont'd. Exploration activity in the Kenora District in 1997

| No | Company/Individual (Occurrence Name) or Property                                | Township/Area (Commodity)                               | Exploration Activity (Incentive Program) |
|----|---|---|--|
| 7  | Consolidated Professor Mines Ltd.   | Snowshoe Bay area (Au)                                  | DD                                       |
| 8  | Cousineau, L., Cousineau, R. & Desjardins, K.                                   | Bennett Lake area (Au)                                  | Pr, Str., Tr, Samp., (OPAP)              |
| 9  | Etherington, R.P.   | Code Township (Au)                                      | Pr, Lc, Str., Samp., Beep, (OPAP)        |
| 10 | Falcon Crest Resources  | Line Lake area (PGM, Cr)                                | DD                                       |
| 11 | Hornby Bay Exploration  | Dogpaw Lake area (BM)                                   | Pr, AEM, AM, GC, GM                      |
| 12 | Houston Lake Mining Inc./Inca Mining Corp.                                      | Dogpaw Lake area (Au)                                   | IP, DD, Str., Samp., GM                  |
| 13 | International Precious Metals   | Buchan Bay area (Zn, Cu, Au)                            | DD, Samp.                                |
| 14 | Lavigne, M.   | Kawashagamuk Lake area (Au)                             | Lc, IP, (OPAP)                           |
| 15 | Minescape Exploration   | Manion, Sandbeach, Bennett and Hepburn lakes areas (BM) | DD, GL, GC, AEM, AM, GRM, GM, DGP        |
| 16 | Mowatt, A. and Thorgrimson, P.  | Paterson Lake area (Li, Ta, Cs, Rb)                     | Pr, Str., Samp., (OPAP)                  |
| 17 | Nelson Granite  | Forgotten Lake area (DS)                                | Str., Bulk                               |
| 18 | Nuinsco Resources Ltd.  | Richardson and Patullo townships (Au, Ni, Cu)           | DD, OD, DGP, Samp.                       |
| 19 | Nuinsco Resources Ltd.  | Rowan Lake and Brooks Lake areas (Au)                   | Str., Samp., GM                          |
| 20 | Phelps Dodge Corporation Canada Ltd.  | Dash Lake area (BM)                                     | Lc, IP, GM, GL, GC, Samp.                |
| 21 | Phelps Dodge Corporation Canada Ltd.  | Garnet Bay, Fisher and Teggau lakes areas (Au)          | Pr, Samp.                                |
| 22 | Phelps Dodge Corporation Canada Ltd.  | Watten Township (BM)                                    | DD                                       |
| 23 | Plomp, F.P.   | Temple Township (Au)                                    | Pr, Samp. (OPAP)                         |
| 24 | President Mines Ltd.  | Haycock Township (Au)                                   | DD                                       |
| 25 | Redden, J., Lundmark, H., McAteer, W.   | Boyer Lake area (Au)                                    | GM, Samp., (OPAP)                        |
| 26 | Riives, I.J.  | Brownridge Township (Au)                                | Pr, Samp. (OPAP)                         |
| 27 | Starcore Resources Ltd./GMD Resources Corporation                               | Dogpaw Lake area (Au)                                   | GL, GM, Lc, Pr, Samp.                    |
| 28 | Stephana Resources Ltd.   | Bad Vermilion Lake area (Ti)                            | GEM, GM                                  |
| 29 | Tantalum Mining Company of Canada Ltd.  | Treelined Lake area (Li, Ta, Cs, Rb)                    | GL, Samp., DD                            |
| 30 | Teck Explorations Ltd. and Corona Gold Corporation (Thunder Lake West property) | Zealand Township (Au)                                   | DD                                       |
| 31 | Tri-Origin Resources  | Bridges, Tustin and MacNicol townships (Au)             | AEM, AM, GL, GC, Pr                      |
| 32 | Twomey, T.  | Zealand Township (Au)                                   | (OPAP)                                   |
| 33 | Wolfden Resources/Jonpol Explorations Ltd                                       | Vista Lake area (Au)                                    | DD                                       |

## GOLD

**Teck Exploration Ltd.** and joint-venture partner **Corona Gold Corp.** continued exploration on their Thunder Lake property in Zealand Township (30). Diamond drilling conducted in 1994 identified two gold-bearing shoots, approximately 152 m (500 feet) apart along strike, which occur in a 30 m (100 foot) wide, east-trending envelope of quartz-sericite schist in metavolcanic rocks. In early 1997, the joint-venture partners announced an inferred resource of 3.65 million tonnes grading 7.28 grams per tonne gold (0.21 ounce per ton gold)(press release, Corona Gold Corporation, January 10, 1997). This resource was based on a total of 39 600 m (130 000 feet) of diamond drilling conducted

prior to 1997. In early 1997 a 19 800 m (65 000 foot) drilling program was initiated to target new exploration areas and provide some in-fill drilling. Results from the first nine holes of the program included the following values: 10.8 feet grading 1.07 ounces per ton gold; 10.5 feet grading 0.34 ounce per ton gold; and 3.3 feet grading 0.23 ounce per ton gold. (*Canada News Wire*, February 28, 1997).

The joint-venture partners also announced their intention to construct a 500 foot exploration decline to a vertical depth of 80 feet in the spring of 1998. The decline would allow for the extraction of a bulk-sample of the zone by drifting along a strike-length of approximately 650 feet. (press release, Corona Gold Corporation, January 10, 1997).

**Nuinsco Resources Ltd.** continued a regional exploration program, initiated in 1993, of the Rainy River lowlands (18). Nuinsco's large land package consists of discontinuous blocks of claim units and private land holdings along an east-trending 60 km length between Potts Township and the mouth of the Rainy River. The area is underlain by metavolcanic rocks, bordered to the north by the Sabaskong batholith, and on the south by the Quetico fault.

Mineralization hosted within the 17 zone is contained within a northwest-trending shear zone, which cuts "quartz-eye" dacite. The zone has a strike length of 1 km, is carbonatized and contains up to 5% pyrite and trace chalcopyrite. A study conducted by Dr. L.D. Ayres of the University of Manitoba proposed a subaqueous caldera model for deposition of the volcanic sequences. Ayres suggests that the gold was precipitated from hydrothermal fluids generated by high-level porphyry or gabbro intrusions (Assessment files, Kenora District). A progress report provided by Overburden Drilling Management Limited (ODM) identified similarities of gold-in-till anomalies with those found in the Casa-Berardi gold deposits in Quebec. Similarities in geological settings were also found with porphyry-hosted mineralization (Timmins-type) and dacite-hosted mineralization (Bousquet-type) (press release, Nuinsco Resources Limited, April 17, 1997).

Exploration in 1997 included: an airborne electromagnetic and magnetic survey totalling 330 line kilometers; 195 reverse-circulation drill holes for a total of 5 471 m; 62 diamond drill holes for a total of 13 214 m; and sampling of these drill holes. The diamond drilling was focused on further delineating the 17 zone. Hole 97-06 intersected 37.8 m (124 feet) grading 3.4 grams gold per tonne (0.10 ounce gold per ton) with a spectacular 0.27 m wide section assaying 2 559 grams per ton gold (74.6 ounces per ton gold) (press release, Nuinsco Resources Ltd., February 21, 1997). Results from these holes were combined with previous drilling to calculate an inferred resource estimate of 25.2 million tonnes grading 1.36 grams per ton gold (0.039 ounce per ton gold). In addition, the reverse-circulation drilling program delineated five (5) additional gold-in-till anomalies outside of the 17 zone (press release, Nuinsco Resources Ltd., May 30, 1997).

**Avalon Ventures Ltd.** conducted a significant amount of exploration on their Dubenski-Dogpaw Lake properties (2), located approximately 60 km southeast of Kenora. The Dubenski property (Figure 2), which was optioned in late 1996, consists of 22 leased claims and has a drill-indicated resource of 253 000 tons grading 0.24 ounce gold per ton (*Canadian Mines Handbook*, 1997). The Dogpaw Lake gold project includes four properties: the Sewell; Flint Lake; Cedartree Lake and Caviar Lake.

On the Dubenski property a Phase I diamond drilling program was conducted in winter 1997. The target zone of mineralization was a 91 m wide quartz-sericite-pyrite schist with free gold visible along foliation planes. The zone is known as the Flint Lake shear and is a splay off of the larger Pipestone-Manitou fault, which is a through-going fault system (Blackburn and Hinz, 1995). A total of 2 788 m in 14 holes was drilled primarily on the Shaft zone, to a maximum depth of 250 m. Significant intersections from early drill holes included 14.1 m assaying 25.4 grams (*sic*), including a high-grade section of 10.1 m grading 32.6 grams (*sic*). Later in the program hole D97-6 intersected 3.5 grams (*sic*) over 19.2 m, including 13.0 grams (*sic*) over 2.3 m (*The Northern Miner*, April 28, 1997). The drill program identified two sub-parallel mineralized zones north and south of the Shaft zone. Surface mapping confirmed the surface expression of the northerly zone, approximately 400 metres east of the

Shaft zone. Structural mapping of stripped outcrops over the Shaft zone indicated that the mineralization plunges moderately to the east. Geological mapping, prospecting and sampling late in the field season identified a previously unrecognized shear zone. The zone ranges in width from 10-30 m and grab samples returned spectacular assays of 117.05 grams per tonne gold, 111.70 grams per tonne gold and 79.13 grams per tonne gold respectively. The new mineralized zone is approximately 400 metres south of the Shaft zone on the shore of Cedartree Lake. Gold mineralization, similar to that seen at the Shaft zone, is present in sheared and silicified felsic metavolcanic and gabbroic rocks (Avalon Ventures Ltd., annual report, 1997).

Work on the Dogpaw Lake project included linecutting, geological mapping, prospecting, sampling and ground magnetometer surveys. On the Flint Lake property, northeast of the Dubenski, the continuation of the Flint Lake shear was identified. An additional gold-bearing shear zone was identified sub-parallel to the Meahan occurrence. Grab samples of 1.32 grams gold per ton and 2.42 grams gold per ton were obtained from sheared and sericitized volcanic rocks over a 250 m strike length (press release, Avalon Ventures Ltd., November 13, 1997).

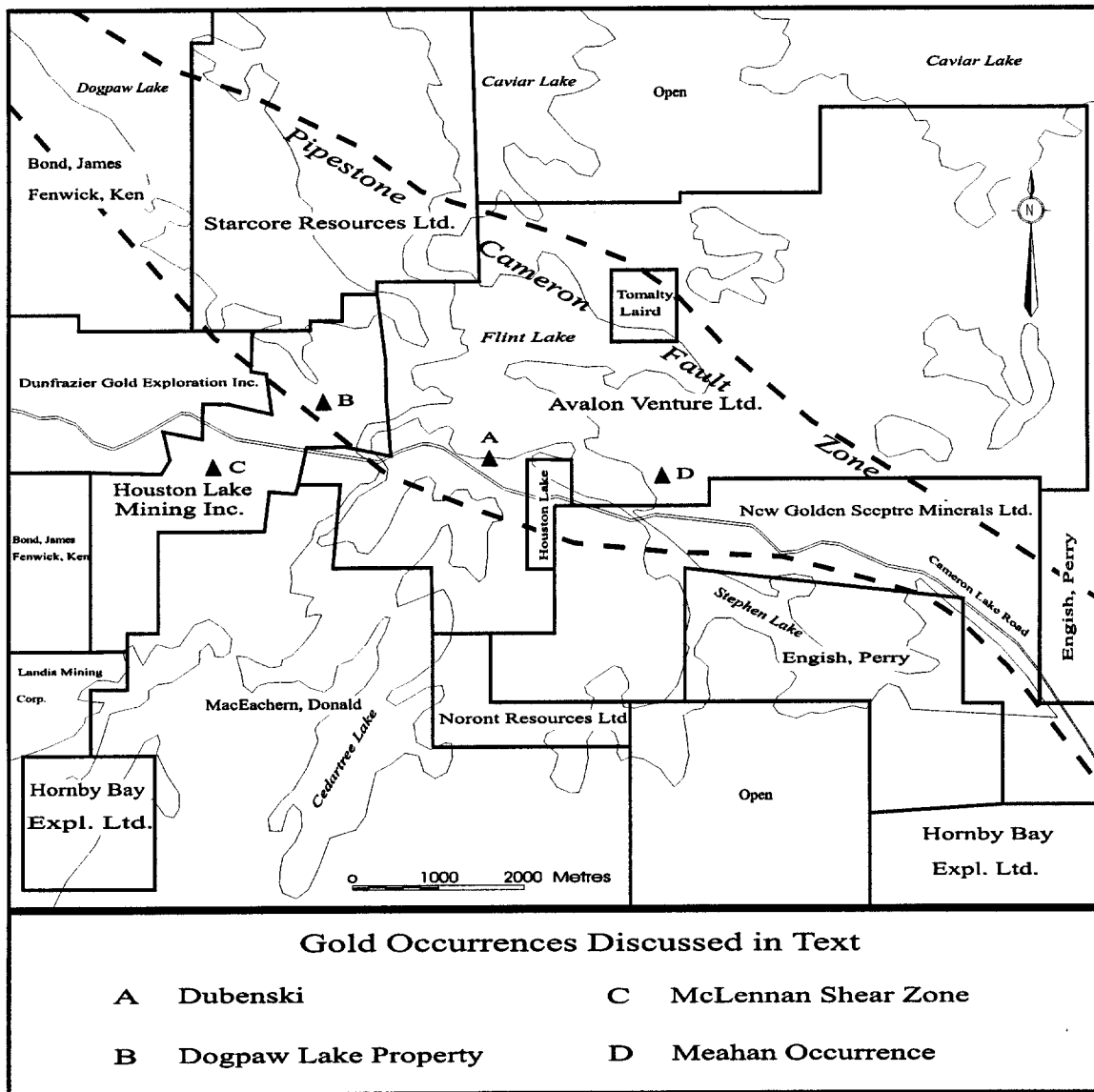


Figure 2. Active properties in the Dogpaw Lake area, 1997.

**Houston Lake Mining Inc.** and joint-venture partners **Canadian Arrow Mines Ltd.** and **Inca Mining Corp.** conducted exploration on properties held south of Dogpaw Lake (12). In the fall of 1996, Houston Lake and Canadian Arrow signed an agreement whereby Houston Lake could acquire a 70% interest in the property by spending \$1 750 000 on exploration. Initial work was conducted on the Dogpaw Lake property (Figure 2) which consists of 13 leased claims with a drill indicated reserve of 96 650 tons grading 0.43 ounce gold per ton (*The Northern Miner*, May 4, 1961). An induced polarization (IP) geophysical survey was conducted in late 1996 and early 1997. The survey identified four sub-parallel IP anomalies, ranging in width from 25 to 150m. They are co-incident with north-east trending structures, which are likely splays off of the major Pipestone-Manitou fault. In early 1997, Houston Lake announce that they had acquired the McLennan and Peninsula properties for cash payments and had an additional 9 claims staked contiguous to the south of the McLennan. Confirmation drilling on the #3 IP zone yielded a 3.69 m intersection grading 12.66 grams per ton gold (*sic*) in a quartz-feldspar-carbonate breccia containing coarse visible gold and 5% to 20% pyrite. Drill hole DP97-03 intersected 8.0 m grading 36.44 grams per ton gold, (*sic*) including 4.8 m assaying 59.82 grams per ton gold (*sic*) and 0.6 m grading 396.4 grams per ton gold (*sic*).

Presence of a large stringer zone at a vertical depth of 210 m (689 feet) and mineralized zones that pinch and swell was identified by the drill program. Hole DP97-38 targeted the stringer zone and intersected 4.9 m grading 6.17 grams per ton (*sic*). By year-end a total of 41 holes were drilled for a total of 4 323 m.

In the fall of 1997, Houston Lake and Canadian Arrow entered an option agreement with **Inca Mining Corp.**, whereby Inca could earn a 35% interest in the property. Prospecting and sampling identified a new, high-grade shear zone on the McLennan property (press release, Houston Lake Mining Inc. and Inca Mining Corp., November 20, 1997). Stripping and sampling indicated the shear to be 20 m (68 feet) wide and approximately 800 m (2 625 feet) wide with a north-south strike. It is located approximately 300 m (984 feet) east of the previously documented McLennan Shear Zone. The shear zone is hosted within gabbro, is highly altered (silicification, hematization and ankeritization) and contains up to 5% pyrite and 15% fuchsite. Chip sampling of the zone returned assays as high as 74.62 grams per tonne gold (*sic*). Sampling of the McLennan shear yielded assays up to 6.52 grams per tonne (*sic*).

**Consolidated Professor Mines Ltd.** (a 100% owned subsidiary of Royal Oak Mines Inc.) drilled two holes from the ice on Shoal Lake, totalling 1783 feet on the Yeoman option which is part of the wholly owned Duport project (7). Drilling was conducted in an attempt to reproduce values reported by W.C. Yeomans (Assessment Files, Kenora District). Drilling intersected quartz veins which yielded two separate intersections which assayed 2.0 feet grading 0.343 ounce gold per ton and 2.5 feet grading 0.341 ounce gold per ton (P. Harvey, Royal Oak Mines, personal communication, 1998).

## RARE METALS

Rare-metal pegmatites became prime exploration targets in the Kenora District following the release of Open File Report 5946 (Breaks and Tindle 1996). Field work by Breaks and Tindle identified seventeen new occurrences of rare-metal pegmatite mineralization within a 0.6 by 1.5 km area. The largest occurrence, a petalite-bearing pegmatite named the “Big Whopper”, had approximate dimensions of 80 m by 450 m. Mineralogy identified in the occurrences included: cassiterite, beryl, petalite, wodginite, Fe-columbite, and Mn-tantalite (Breaks and Tindle, 1996). Company exploration discussed below and additional work by Breaks and Tindle in 1997 revealed the Separation Rapids Pegmatite group to potentially be of world-class proportions i.e. potentially comparable with the Bikita Pegmatite of southern Zimbabwe. The Separation Rapids group is hosted in what is believed to be the eastern extension of the Winnipeg River-Cat Lake pegmatite field of Manitoba, which hosts the Bernic Lake Mine of the Tantalum Mining Corporation of Canada Ltd. (Tanco) (Breaks and Tindle, 1997).

**Avalon Ventures Ltd.** conducted exploration on their Separation Rapids rare-metal discovery in 1997 (3). The largest of the pegmatites identified by Breaks and Tindle (1996) was titled the “Big

Whopper". It was staked in July 1996, with additional ground, by prospectors R. Fairservice and J. Willis and optioned to Avalon Ventures in October 1996. The property is composed of seven unpatented mining claims totalling 52 units and is located approximately 60 km north of Kenora, Ontario.

Work conducted by Avalon Ventures included: linecutting, a ground magnetometer survey, geological mapping, stripping, trenching and lithochemical sampling. Geological mapping confirmed the strike length of the Big Whopper to be 1.2 km with a maximum width of 90 m. A swarm of narrower pegmatite dikes were identified on the flanks of the Big Whopper (press release, Avalon Ventures Ltd., July 17, 1997). Trench assays obtained in August of 1997 confirmed the presence of high-grade lithium petalite mineralization (e.g. 1.58%  $\text{Li}_2\text{O}$  over 58.9 m) and anomalously high rubidium concentrations (e.g. up to 0.375%  $\text{Rb}_2\text{O}$ ) (press release, Avalon Ventures Ltd., August 20, 1997). Encouraged by the surface work, Avalon Ventures commenced with a Phase I diamond drilling program in October. The program was designed to test the vertical continuity of the Big Whopper pegmatite, determine its subsurface geometry, develop a mineral inventory of the petalite zone and attempt to identify zones of tantalum and cesium enrichment. Initial drill results returned consistent grades approximating 1.5%  $\text{Li}_2\text{O}$  and 0.3%  $\text{Rb}_2\text{O}$  over true widths of 30 to 60 m, to a vertical depth of 100 m. Mineralogy of the Big Whopper consists of petalite, rubidium-rich potassic feldspar, quartz, micas and minor lepidolite (press release, Avalon Ventures Ltd., November 5, 1997). Later drilling confirmed the extension of the Big Whopper to vertical depths of 250 m, with intersections of 40 to 60 m width averaging 1.4%  $\text{Li}_2\text{O}$  and 0.35%  $\text{Rb}_2\text{O}$ . Highly anomalous tantalum values of up to 0.014%  $\text{Ta}_2\text{O}_5$  over 14.5 m were intersected, indicating the potential for economic concentrations of tantalum which could be recovered as a by-product of petalite production. At the completion of the drilling program a total of 4 922 m of core was drilled in 30 holes. A Phase II drill program is planned to start in early February 1998. In January 1998 Avalon Ventures announced a preliminary resource calculation of the petalite zone of at least 7 081 700 tonnes grading 1.285 %  $\text{Li}_2\text{O}$  and 0.346 %  $\text{Rb}_2\text{O}$  over a strike length of 600 m and to a maximum depth of 250 m. Metallurgical and market studies initiated in November were still in progress (press release, Avalon Ventures Ltd., January 30, 1998).

**Champion Bear Resources Ltd.** mounted an exploration program on its Separation Rapids property (6), located approximately 60 km north of Kenora. The property contains five rare-metal pegmatite dikes identified by Breaks and Tindle (1994): Marko's pegmatite; pegmatite #6; pegmatite #7; pegmatite #8; and pegmatite #10. Marko's pegmatite is the largest dike, with a strike length of 170 m and maximum exposed width of 8 m. Channel sampling was conducted by Champion Bear and assays returned: 1.5 m grading 0.07% Ta, .008% Sn and 0.5% Cs; and 1.6 m grading 0.11% Ta, 0.08% Sn and 0.10% Cs. A ten hole diamond-drill program, totalling 1088 m, was conducted with seven holes targeting Marco's pegmatite. The first four holes intersected the dike across widths between 2.0 and 12.0 m, intersections assayed as high as: 0.05% Ta, 0.07% Sn, 0.29% Rb and 0.12% Cs over 6.3 m (*Canadian Corporate NewsNet*, December 10, 1997). Lithium assays were not available at the time of writing. Drilling under the other four dikes returned assays as high as 0.03% Ta and 0.04% Sn. Surface geological mapping and lithochemical sampling were also conducted.

# Kenora District Staff and Activities

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At the beginning of the year the Resident Geologist's office was staffed by C.E. Blackburn, Resident Geologist; P. Hinz, Staff Geologist; M.J. Guderyan, Secretary; and S. Zurevinski, summer assistant. Reorganisation of the Resident Geologist Program resulted in the following changes: C.E. Blackburn to Regional Resident Geologist, based in Red Lake; P. Hinz to District Geologist, Kenora; the move of M. J. Guderyan to the Northern Development Officers office; and the hiring of C. Ravnas as Geological Assistant. The Kenora office also changed location to 810 Robertson Street, Kenora, Ontario.

The Kenora District office is now co-located with the Mineral Development Co-ordinator's office, the Northern Development Officer's office and the Northwest Support office. With the consolidation of Mining Lands functions into Sudbury the Kenora District office now provides access to claims information via two CLAIMS Client Service (CCS) workstations, claim maps and and limited publication sales. Prospector licences, renewals, claim tags and line tags are also available for sale through the office.

C.E. Blackburn and P. Hinz attended the Prospectors and Developers of Canada Convention in Toronto in March and manned the Northwestern Ontario regional display. A poster and talk highlighting activities in the district were presented at the Northwestern Ontario Mines and Minerals Symposium held in Thunder Bay in April. P. Hinz participated in a workshop related to the Integration of Regional Economic Development Activities in Sault Ste. Marie. P. Hinz also attended the Institute on Lake Superior Geology in Sudbury in May. P. Hinz participated in a display presented by the Ontario Geological Survey at the Manitoba Mining and Mineral Convention held in Winnipeg, Manitoba in November. P. Hinz also attended the Ore Deposits Workshop '97 at the University of Toronto in December.

In 1997, a total of 6 property visits were conducted by the Kenora District Office staff (Table 4 and Figure 3).

**Table 4.** Property visits conducted by the Kenora District Office in 1997.

| Number (keyed to Figure 2) | Property/Occurrence   |
|----------------------------|---|
| 1                          | Alice A. occurrence, Bennett Lake area  |
| 2                          | Game Lake property, Bridges and Tustin townships  |
| 3                          | Thunder Lake property, Zealand Township   |
| 4                          | Avalon Ventures – Separation Rapids Rare-metal pegmatite, Paterson Lake area            |
| 5                          | Tantalum Mining of Canada Ltd. – Separation Rapids Rare-metal pegmatite, Treelined Lake |
| 6                          | Fornieri-Hardrock Bay property, Buchan Bay area   |

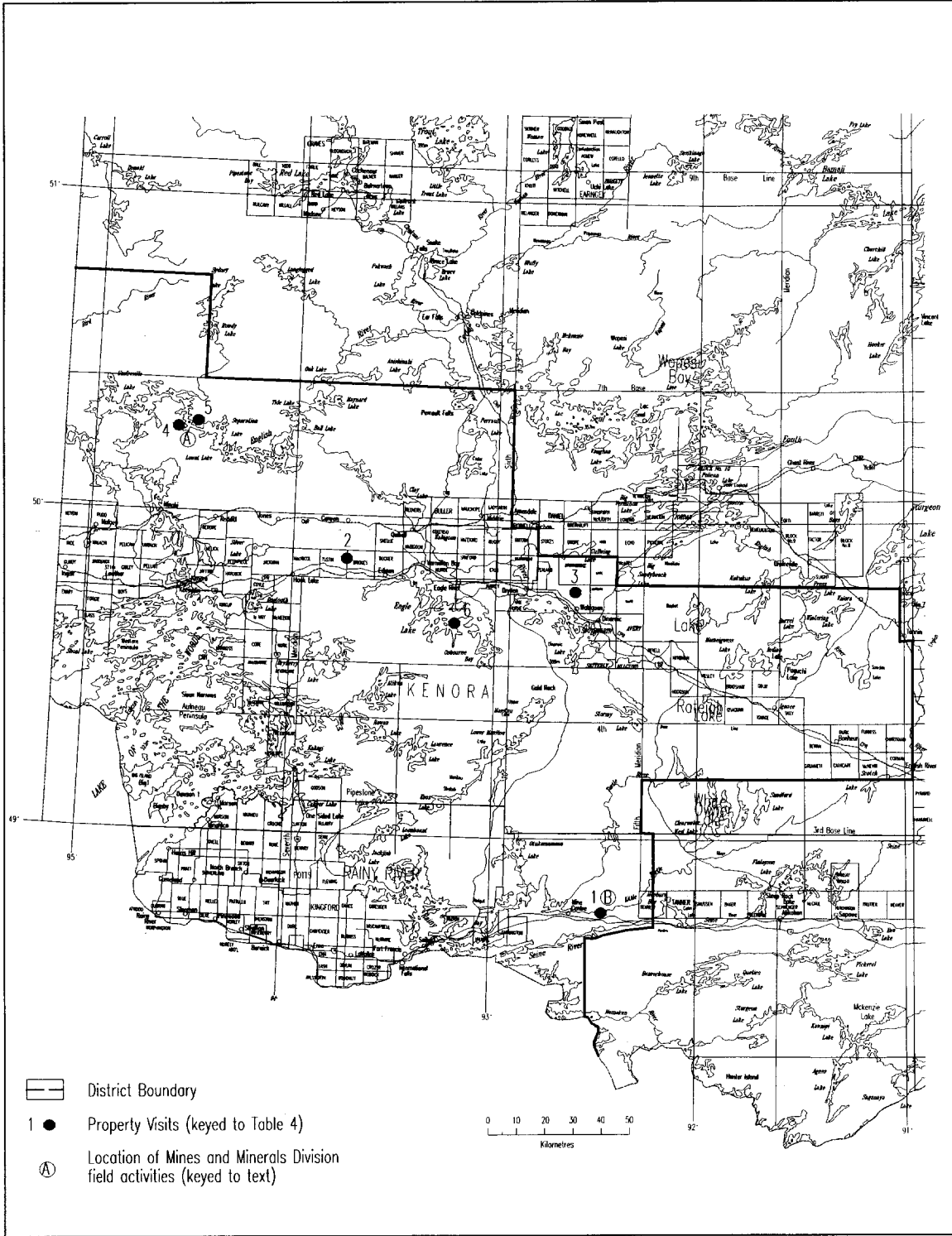


Figure 3. Kenora District, property visits and Mines and Minerals Division field activities, 1997.



# Property Examinations

Major authorship for the following property visits is indicated in parentheses following titles.

## ALICE A. OCCURRENCE, BENNETT LAKE AREA (P. HINZ)

The Alice A. Occurrence is located in the Bennett Lake area (NTS 52 C/16SW), approximately 13 km east of the hamlet of Mine Centre. The occurrence can be accessed by a logging road, to the west of the Manion Lake Road, 1.5 km north of Highway 11. The logging road passes within 50 m of the old Alice A. shaft (Figure 4).

The occurrence is located within a property consisting of 3 contiguous claims, held by Messrs. R. and L. Cousineau, and K. Desjardins, all of Fort Frances. A number of exploration programs have been conducted over the property since the discovery of gold in quartz veins in 1894. The most recent program was run by Fire River Gold Corp. from 1988 to 1990, which included geological, geophysical and geochemical surveys (Assessment Files, Kenora District Office). The Cousineau Bros. staked the Alice A. occurrence and surrounding ground in 1996 and proceeded with an OPAP-funded trenching and sampling program in the same year. Mechanical stripping, trenching and sampling were conducted in 1997. Late in 1997 the property was optioned to Hexagon Gold Ontario Ltd. as part of an approximately 230 unit package extending from Seine Bay-Shoal Lake in the southwest to Bennett Lake in the east.

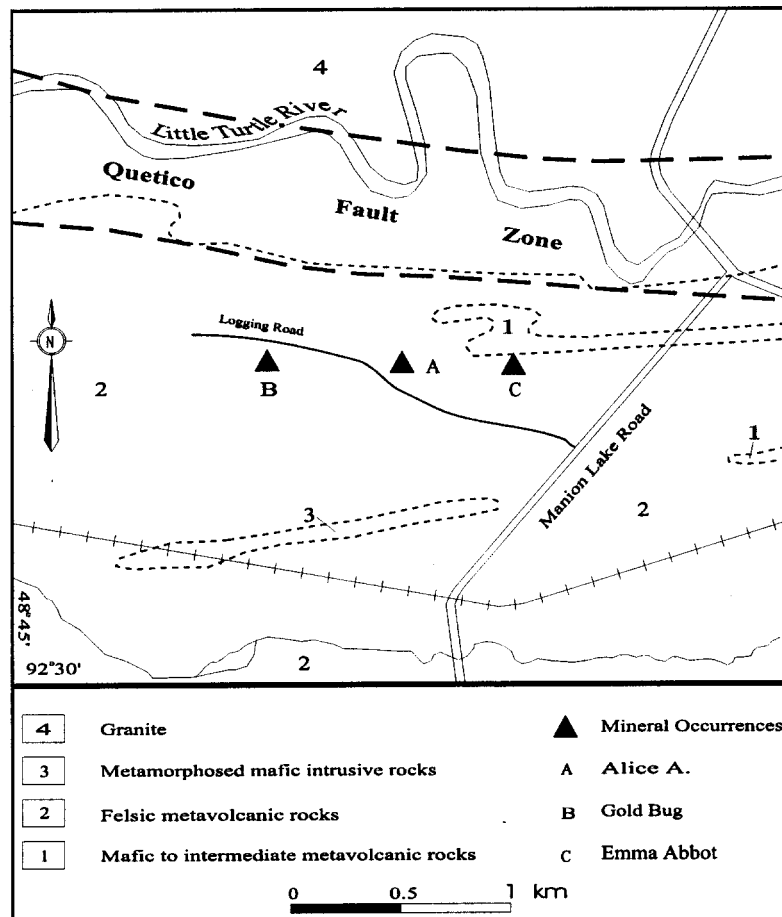


Figure 4. Location of the Alice A. occurrence, Bennett Lake area.

The occurrence is underlain by metavolcanic rocks of the Swell Bay–Mine Centre greenstone belt, at the southern boundary of the Wabigoon subprovince. These rocks are situated within a wrench zone, identified by Poulsen (1986), between the Quetico fault to the north, and the dextral Seine River fault to the south. Within the wrench zone gold mineralization is associated with quartz–carbonate veins within carbonatized shear zones. The alteration and vein development is best developed at lithologic contacts (Stone and Halle 1997).

The current work conducted by the Cousineau's has uncovered both quartz–carbonate veins and carbonatized shears. Stripping conducted approximately 20 m west of the Alice A. shaft has uncovered moderately foliated felsic metavolcanic rocks—possibly crystal tuff—striking at 081°. A distinctive centimetre-scale banding was observed in the felsic rocks, that could either be flow-banded quartz–phyric rhyolite, rhythmically layered quartz–crystal tuff or a quartz porphyry with alteration along cleavage planes. Examination of sawn hand specimens leads the author to believe that the rock is a quartz crystal tuff. A carbonatized shear cross-cuts the felsic rocks at 062°. A series of quartz–carbonate (primarily ankerite) veins cross-cut both units at 110°. There are two phases of veining, one of which appears to be pre-shear, is folded within the foliation and contains pyrite, galena and sphalerite. Post-deformation/alteration quartz veins are parallel to the foliation and barren of sulphides. A sample of a quartz–carbonate vein collected from a waste dump near the new stripping was sawn and found to contain abundant sphalerite, galena and coarse visible gold.

A new showing was uncovered approximately 300 m west of the Alice A. on the south side of the logging road. A laminated quartz-vein, of 3 m maximum width, strikes 126° has an apparent vertical dip and extends across the entire stripped area i.e. approximately 25 m. The vein is hosted within deformed felsic metavolcanic rocks, which resemble rhyolite. These rocks contain an unusual net-like fracture pattern with a polygonal appearance and are in contact with highly carbonatized mafic metavolcanic rocks (i.e. amygdaloidal flows). These rocks are flanked to the west by a 4 to 5 m wide ankerite-rich shear zone, striking 102°.

To the southwest of the new showing, three small pits were discovered by R. and L. Cousineau of Fort Frances. They may be part of the old Gold Bug occurrence. The rocks in the pits are ankeritized mafic metavolcanic rocks with quartz–carbonate veining. Pyrite and chalcopyrite were noted in the laminated vein, which strikes 114°.

Twelve samples were taken from various locations at the Alice A. occurrence. Sulphide mineralization was observed in a number of vein systems and included galena, sphalerite, pyrite and coarse visible gold. The mineralization observed is quite similar to other occurrences in the area—most notably the Mayflower Prospect west of Calm Lake and the McKenzie–Gray prospect south of Bad Vermilion Lake. Assays were not available at the time of writing.

The association of gold with carbonatized shear zones in the Mine Centre area is well documented, (Poulsen 1981, 1984, 1986; Stone and Halle 1997). The new showings identified by the Cousineau's re-affirm the potential of the area to host further gold mineralization.

## **FORNIERI BAY PROSPECT, FORNIERI BAY AREA, EAGLE LAKE (P. HINZ)**

The Fornieri Bay prospect is located on the southeast shore of Fornieri Bay, Eagle Lake (NTS 52 F/11NE), approximately 29 km southwest of Dryden, Ontario. The property is accessible by boat from a number of access points on the north shore of Eagle Lake (Figure 5).

The property consists of two unpatented claims, 1133504 and 1133505, held by J.E. Bond II of Welch, West Virginia and S.P. Johnson of Dryden, Ontario. The property has a lengthy exploration history dating back to 1935 when S.S. Fornieri staked 15 claims for the Kirkland Lake Prospectors Syndicate (Parker, p.30–35, *in* Blackburn et al. 1988). The most recent exploration was conducted by

Raleigh Resources Ltd. and consisted of an 11 hole diamond drilling program, totalling 1581.3 m. Hole 89-10 intersected 0.37 ounce gold per ton over 5 feet (Blackburn et al. 1990). S. Johnson staked the ground in 1996 and conducted prospecting and sampling on the previously exposed stripped areas.

The Fornieri Bay prospect is underlain by a mixed sequence of mafic to felsic metavolcanic rocks, which are part of the Lower Wabigoon volcanics. These overlie the Eagle Lake volcanics which are primarily massive and pillowed mafic metavolcanic rocks. The volcanic rocks are all metamorphosed to greenschist facies (Parker, p.30-35, *in* Blackburn et al. 1988).

The first location (Figure 5) visited was a large stripped area south of the Raleigh Resources core shack, which is located on the west shore of Fornieri Bay. Rocks exposed by the stripping included flow banded and flow brecciated aphanitic rhyolite. Sulphides, predominantly pyrite, were observed as pods, fracture fillings and disseminations in the rhyolite. Some chlorite seams were observed and may be indicative of hydrothermal fluid alteration.

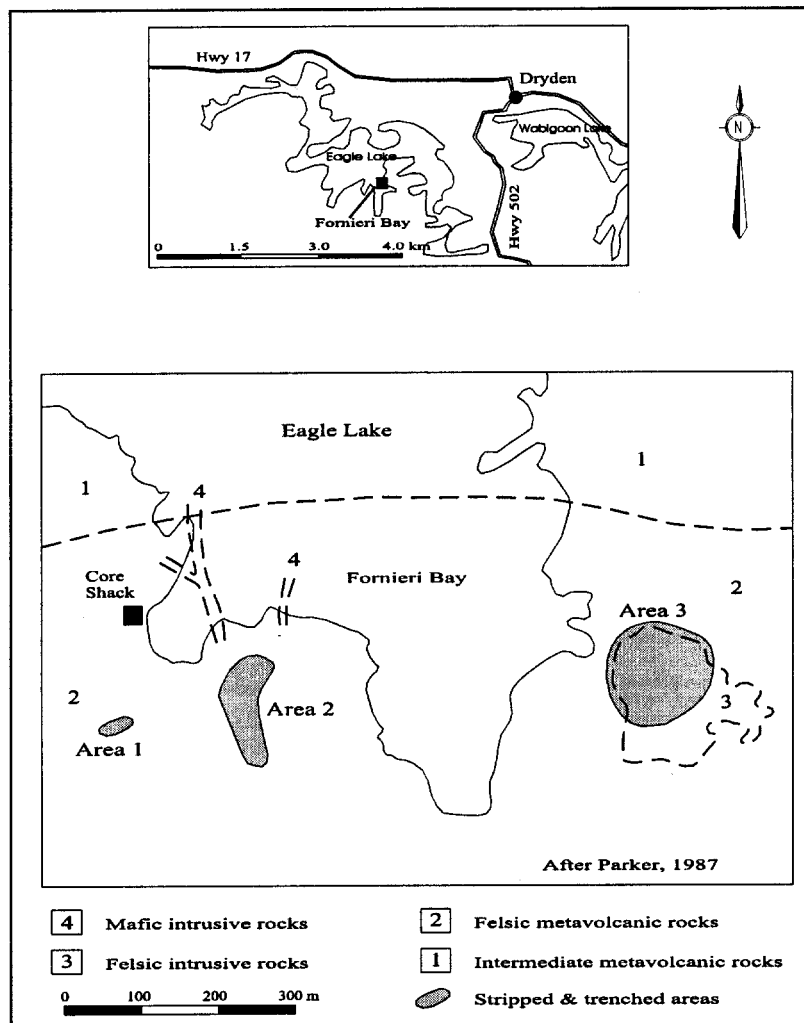


Figure 5. Location of the Fornieri Bay prospect, Eagle Lake area

The second location was a large stripped area on the south shore of Fornieri Bay. Vesicular intermediate metavolcanic flows are cross-cut by a porphyritic mafic dyke, identified by J. Parker (p.30-35, *in* Blackburn et al. 1988) as diorite. Some pyrite pods were observed within the metavolcanic rocks. A sample collected by the author of porphyritic felsic metavolcanic rock containing 2-3% sulphide minerals, assayed 2.68 ounces gold per ton, 0.45% Cu and 83 ppm Zn.

A third stripped area is located inland from the southeast shore of Fornieri Bay. Felsic rocks that may be crystal tuff, but identified by J. Parker (p.30-35, *in* Blackburn et al. 1988) as quartz porphyry, underlie the whole stripped area. One sample of the crystal tuff/quartz porphyry was assayed and returned 140 ppm Cu and 92 ppm Zn. Samples of this area taken by J. Parker (p.30-35, *in* Blackburn et al. 1988) assayed up to 280 ppb gold from quartz veins and stringer zones. A sample collected by the author of quartz vein material containing sulphide minerals and chlorite, from a deep pit or shaft west of the stripped area, assayed 0.06 ounce gold per ton.

The author is encouraged by the results of two samples out of five collected during 1997. The author believes that the geological and metallogenic model proposed by J. Parker (p.30-35, *in* Blackburn et al. 1988) still is applicable and this prospect is well worth investigating. Further discussion is given under "Recommendations for Exploration."

# Recommendations for Exploration

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## RARE-METAL PEGMATITE POTENTIAL NORTH OF UMFREVILLE LAKE.

Work conducted by Avalon Ventures, Champion Bear Resources and the Tantalum Mining Corporation of Canada Ltd. in the Separation Rapids area, north of Kenora, has indicated the potential for economic deposits of petalite, tantalum, rubidium and cesium. The area, identified by Breaks and Tindle (1994) has been proven to host the largest petalite-bearing pegmatite in North America. While efforts have been focused on the Separation Rapids area, the potential for the discovery of additional pegmatites exists in rocks north of Umfreville Lake. The pegmatite group hosting the Big Whopper pegmatite is believed to be the eastern extension of the Winnipeg River-Cat Lake pegmatite field of Manitoba, which hosts the Tanco Mine (Breaks and Tindle, 1997). From a regional perspective the Separation Lake greenstone Belt extends to the northwest from the Separation Rapids area and continues westward to the north of Umfreville Lake and on into Manitoba. Within these rocks, Breaks and Tindle (1997) recommend the examination of the Ryerson-Routine lakes area for potential rare-metal pegmatites. Readers are directed to Open File Report 5966 authored by Breaks and Tindle (1997) for further information on the Separation Rapids area and other recommendations.

## GOLD POTENTIAL OF THE EAGLE-WABIGOON LAKES AREA

Jack Parker of the Ontario Geological Survey, while on staff in the Kenora Resident Geologist's Office as the Dryden Economic Geologist, conducted an in-depth study of gold mineralization of the Eagle-Wabigoon Lakes area in 1986 (Parker, p.30-35, *in* Blackburn et al. 1988). Parker also produced preliminary map P.3169, Precambrian Geology, Fornieri Bay - Hardrock Bay Area (Parker 1987). This recommendation is a summary of work reported by Parker. Rocks of the Lower Wabigoon Volcanics are known to host numerous past producing gold mines, prospects and occurrences. Following a visit to the Fornieri Prospect in 1997 with prospector S.P. Johnson and Regional Resident Geologist C.E. Blackburn, the author reviewed literature produced by Parker and believes the area is worthy of further exploration.

Parker (J. Parker, unpublished data, 1986) discussed the controls of gold mineralization in detail. Two types of gold emplacement were identified: structurally controlled deposits; and stratigraphically controlled deposits. The structurally controlled deposits were subdivided into i) shear zone hosted and ii) tension fracture hosted. The majority of gold deposits in the Eagle-Wabigoon lakes area occur within shear zone hosted quartz veins, which are not restricted to any one lithology. The shears host quartz veins, generally less than 1 m wide, containing variable amounts of pyrite, chlorite, ankerite, calcite, black tourmaline, specular hematite and lesser amounts of chalcopyrite and galena. Predominant alteration types are chloritization and carbonatization (ankerite or calcite), which are restricted to the shear zones and can include pyritization, sericitization, and minor tourmalinization. Gold is primarily restricted to the veins with only infrequent anomalous values in the wallrock. At Fornieri Bay, widespread, anomalous, gold mineralization is associated with disseminated sulphides within weakly sheared, felsic metavolcanic and intrusive rocks.

A few occurrences within the Eagle-Wabigoon lakes area are hosted within gold-bearing quartz veins controlled by tension fracture networks around Flambeau Lake, west of Wabigoon Lake. The quartz veins are predominantly northwest-southeast in orientation and dip to the northeast. Alteration is present as tight haloes around quartz veins and includes carbonatization (ankerite and calcite), sericitization, pyritization, and weak silicification. The veins are primarily white quartz with ankerite, pyrite and lesser chalcopyrite, sphalerite and galena. Gold is present as coarse visible aggregates in the vein material and infrequently in the pyritic wallrock. The veins are hosted by various rock types, but have an affinity for thick sequences of felsic to intermediate intrusive and felsic metavolcanic

rocks whose competency allows for the development of tension fractures. This type of mineralization is not well developed in the Eagle Lake area, however, it is present at the Fornieri Bay prospect where white to blue-gray quartz veins were reported by Moorhouse (1941) to host gold.

Parker also noted the association of the structurally controlled gold mineralization with the abundance of magnetite in the host rocks. He suggested that the magnetite may have acted as a chemical trap: hydrothermal fluids carrying gold react with the magnetite, resulting in sulphidization which precipitates pyrite and while circulating through the country rock. Parker noted the abundance of magnetite in the unaltered country rock while the altered wall rocks are depleted in magnetite and enriched in pyrite.

The second type of emplacement Parker discussed was the stratigraphically controlled gold deposit. This deposit type is independent of obvious structural deformation. Gold mineralization is associated with disseminated sulphides contained within mafic to intermediate metavolcanic rocks and related chemical metasedimentary rocks (chert) near the contact of the Lower Wabigoon volcanics, to the north, and the Eagle Lake volcanics to the south. Pyrrhotite and chalcopyrite are the dominant sulphide minerals with minor pyrite present in the chert. This type of gold mineralization is present at the W.W. Smith prospect located on the north shore of Hardrock Bay, Eagle Lake. Laminated, pyrite-rich chert can be traced to a 10 m wide zone of sulphide-rich, massive volcanic rocks. Parker indicated that the interflow cherts and tuffs may have been deposited during a hiatus between mafic and felsic volcanism. Hydrothermal fluids, related with the later intrusion of the Atikwa batholith, could have remobilized the gold into the iron-rich mafic metavolcanic rocks. The intrusion of northwest-trending felsic dikes generated additional hydrothermal fluids, which may have re-mobilized the gold and sulphides as pervasive low-grade mineralization, upward through the volcanic pile into the fractured felsic metavolcanic rocks.

The Eagle-Wabigoon lakes area is known to host many past-producing gold mines, prospects and occurrences. There is still considerable potential for future discoveries of economic gold deposits. Explorationists should keep in mind the potential for both structurally controlled and stratigraphically controlled mineralization throughout the area.

## **EXPLORATION FOR DIMENSION STONE IN THE KENORA DISTRICT**

Prospecting for potential granite dimension stone deposits has been facilitated by the release of the Bedrock Geology of Ontario map series (maps 2541 to 2544) in 1991. Map units 14 (massive granodiorite to granite) and 15 (diorite-monzonite-granodiorite) have been recognized as having the potential to host quarriable granites. These Neoproterozoic to Mesoproterozoic intrusive rocks are abundant within the Superior Province. Explorationists should examine the maps and target these units for examination.

It is becoming increasingly apparent that numerous areas throughout northwest Ontario, and most particularly the Kenora District, have the potential to host quarriable stone. Aside from the five currently producing granite quarries in the Kenora District (see Mining and Quarrying Activity section), all of which are hosted within unit 15 intrusive rocks, areas which are most promising include: the Lount Lake batholith (unit 15), in the Winnipeg River subprovince, north of Kenora; the area south of Ear Falls which hosts 3 high-potential stone sites (all unit 15) within the Winnipeg River and subprovince; and the Revell, Basket Lake and Indian Lake batholiths (all unit 15) in the Wabigoon subprovince which host three past producers. The Lount Lake batholith, which hosts the current producers, may be the most significant commercial granite target in northwestern Ontario. It covers over 1 500 km<sup>2</sup> and contains an abundant variety of textures and colours.

Evaluation of dimension stone sites includes the following criteria: fracture and jointing frequency; marketability of colour and texture; deleterious minerals; size of deposit; and ready access to transportation.

## OGS Activities and Research by Others

There were two Ontario Geological Survey field projects conducted in the Kenora District in 1997. For the location of the two OGS projects see Figure 3.

- A) F.W. Breaks, Precambrian Geoscience Section, OGS, and A.G. Tindle, The Open University, U.K., continued studies of granite-related rare-metal pegmatite mineralization in the Separation Lake area.
- B) D.Stone, Precambrian Geoscience Section, OGS and J. Halle mapped the Mine Centre-Manion Lake Area as part of a continuing regional program to define major lithostructural domains and favourable environments for mineralization in the central Wabigoon subprovince.

Other studies included the following:

- C) J.R. Parker and J.A. Ayer, OGS conducted a compilation study of evolved rhyolites in the Superior Province which included five areas within the Kenora District.
- D) A.R. Cruden, University of Toronto, as part of Lithoprobe examined the structure and geochronology of the Winnipeg River subprovince, Western Superior Province.
- E) C.J. Thomson, Queen's University, as part of Lithoprobe conducted a teleseismic survey in the Western Superior Transect.

**Table 5.** Publications received by the Kenora District Office in 1997

| Title  | Author                        | Type and Year of Publication                 |
|--|-------------------------------|--|
| Rare-Metal Exploration Potential of the Separation Lake Area: an Emerging Target for Bikita-Type Mineralization in the Superior Province of NW Ontario | F.W. Breaks and A.G. Tindle   | OGS OFR 5966, 27p., 1997                     |
| A Petrographic Study and Basin Analysis Of the Stormy Lake Group, Western Superior Province, near Dryden, Ontario                                      | Leyla H. Weston               | BSc. Thesis, Carleton University, 86p., 1996 |
| Roadside Geology of Ontario: North Shore of Lake Superior; Ontario GEOservices Centre  | E.G. Pye                      | ROCK ON Series 2, 164., 1997                 |
| Ontario Dimension Stone Producers and Processors   | M.C. Gerow                    | Mines Group, 18p., 1997                      |
| Ontario Mining and Exploration Directory 1997  | MNDM Staff                    | OGS 49p., 1997                               |
| A Prospector's Guide to Drift Prospecting for Diamonds, Northern Ontario   | T.F. Morris and C.A. Kaszycki | OGS OFR 5933, 109p., 1995                    |
| White Otter Lake area  | D. Stone, et al               | OGS Map P. 3364, scale 1:50 000, 1996        |
| Werner Lake-English River area   | G.P. Beakhouse                | OGS Map P. 3371, scale 1:50 000, 1997        |
| Werner Lake-English River area   | G.P. Beakhouse                | OGS Map 2516 (colored) scale 1:50 000        |
| Mine Centre area   | D. Stone, et al               | OGS Map P. 3372, scale 1:50 000, 1997        |
| Manion Lake area   | D. Stone, et al               | OGS Map P. 3373, scale 1:50 000, 1997        |
| Topographic Base Map of Ontario, West-Central Sheet  | Digital Series                | OGS Data Set 19, scale 1:1 000 000, 1993     |
| Quaternary Geology of Ontario West Central Sheet   | Digital Series                | OGS Data Set 15, CD-ROM, 1997                |
| Greenstone Belts Airborne MAG-EM Surveys and CD-ROMS   | Digital Series                | OGS Maps 80458 – 80479<br>ERLIS CD-ROMS 1019 |

**Table 6.** Mineral deposits not being mined in the Kenora District in 1997.

| <b>Abbreviations</b>                              |                                  |  |  |   |  |
|---|----------------------------------|--|--|---|--|
| AF  | Assessment Files                 | MLS  | Mining Lands, Sudbury                                    |   |  |
| CMH   | Canadian Mines Handbook          | MR   | Mining Recorder  |   |  |
| GR  | Geological Report                | NM   | The Northern Miner                                       |   |  |
| MDC   | Mineral Deposit Circular         | OFR  | Open File Report   |   |  |
| MDIR  | Mineral Deposit Inventory record | PC   | Personal Communication                                   |   |  |
| <b>Deposit Name/NTS</b>                           | <b>Commodity</b>                 | <b>Tonnage-Grade Estimates and/or Dimensions</b>   | <b>Ownership References</b>                              | <b>Reserve References</b>   | <b>Status</b>  |
| Bad Vermilion Lake Seine Bay Prospect (52C/10NE)  | Fe, Ti, V                        | 1 270 000 tons of 15% TiO <sub>2</sub> and 45% Fe; there is potential for 177 800 tons of titanium sponge.   | Stephanna Resources Jan./96                              | NM 08/15/85, p.3 (Beaver Energy Resources)  | Inactive, 17 claims  |
| Bending Lake Prospect (52F/8SE)                   | Fe                               | Open pit reserves sufficient to maintain plant output of 2 million tons for 20 years. Main zone is 1500 m long by 300 m wide (grade of iron is unstated)   | Noranda Mining and Exploration Inc.                      | MDIR<br>AF  | Inactive<br>K0133  |
| Big Master (Kenwest Mine) (52F/7NE)               | Au                               | Proven and Probable: 123 000 tons of 0.30 ounce Au per ton; Indicated: 600 000 tons of 0.22 ounce gold per ton.<br><br>Probable: 25 000 tons @ 0.48 opt.<br>4 500 tons @ 0.58 opt.<br>8 500 tons @ 0.21 opt.<br>Dump: 1 000 tons @ 0.25 opt. | Goldcorp. Inc., Toronto; c/o David Sannes PCKRG          | CMH, 1988-89, p.92 (Canamerica Precious Metals Inc.)<br><br>OFR 5332, vol. 1, Table 6.8 | Inactive<br>HP366,373,301  |
| Bonanza Mine (52F/10NW)                           | Au                               | 5 000 tons of 0.25 ounce Au per ton across an average width of 1-foot.   | CMH, 1994-95, p.386 (Wiscan Resources Inc.)              | Van Horne Gold Expl. Inc. AF  | Inactive 59 claims<br>K53304 (site)                                    |
| Canadian Arrow (Dogpaw Lake) Prospect (52F/5SW)   | Au                               | Indicated: 96 650 tons of 0.43 ounce Au per ton in 3 veins.<br><br>Probable 30 000 tons @ 0.30 opt.<br>Possible 70 000 tons @ 0.30 opt.<br>Spec. 80 000 tons @ 0.30 opt.   | CMH, 1994-95, p.84 (Canadian Arrow Mines Ltd. )          | Canadian Arrow-Mines Ltd., AF<br>OFR 5332, vol.1, Table 4                               | Inactive 17 claims   |
| Canamerica E Zone (52F/7NE)                       | Au                               | 455 000 tonnes of 0.117 ounce Au per tonne indicated and inferred.<br><br>529 650 tonnes of 0.103 ounce Au per tonne indicated and inferred.   | CMH, 1990-91, p.119 (Co-Maxx Energy Group Inc.)          | NM 07/13/87, p.17(Canamerica Precious Metals Inc.)<br>Cochrane Oil & Gas Ltd., AF       | Inactive 45 claims   |
| Cameron Lake Prospect (52F/5SE)                   | Au                               | Proven, possible, probable: 3 160 148 tons of 0.168 ounce Au per ton   | CMH, 1995-96, p.275 (Nuinsco Resources Ltd.)             | Nuinsco Resources Ltd.  | Care and maintenance 61 leased claims                                  |
| Cedar Island (Cornucopia) Mikado Mines (52E/10SW) | Au                               | Preliminary reserves: 1 234 069 tonnes of 9.62 g/t Au  | CMH, 1995-96, p.220 (Kenora Prospectors and Miners Ltd.) | CMH, 1995-96 p.220  | Advanced Expl. Permit ; Patents D212, D265                             |
| Duport Mine (52E/11SE)                            | Au                               | Total geological reserves: 2 000 000 tons of 0.35 ounce Au per ton; Proven and Probable: 944 000 tons of 0.39 ounce Au per 450 tpd. Est pre-production cost \$52.8 million   | CMH, 1995-96, p.111 (Consolidated Professor Mines Ltd.)  | CMH, 1995-96 p.111  | Environmental assessment in progress Patents S.170,K1332, K1333, K2374 |



**Table 6.** cont'd. Mineral deposits not being mined in the Kenora District in 1997.

| Deposit Name/NTS  | Commodity | Tonnage-Grade Estimates and/or Dimensions  | Ownership References                                | Reserve References   | Status  |
|---|-----------|--|---|--|---|
| Earney-Linburg Occurrence (52E/9NW)   | Au        | 50 m long by 5 m wide quartz vein assaying 1.42 ounce Au per ton across 7.5 feet and 0.37 ounce Au per ton across 9.7 feet.  | Dean Pickell<br>Winnipeg, PC                        | OFR 5695, p.86   | Inactive Patent<br>K9333  |
| Electrum Lake Occurrence Arsenic Zone (52E/11NE)                            | Au        | 97.5 m long by 1.76 m wide by 39.6 m deep (minimum) zone averaging 0.36 ounce Au per ton.  | G. Pogson Thunder Bay, MR, Kenora                   | OFR 5695, p.98   | Claim 1149561   |
| Electrum Prospect A-C Zones (Contact Zone) (52E/11NE)                       | Au, Cu    | A zone-30 m long by 1.5 m wide by 45 m deep averaging 0.34 ounce Au per ton and 0.14% Cu<br>B Zone-45 m long by 0.9 m wide by 61 m deep averaging 0.27 ounce Au per ton and 1% Cu<br>C Zone-45 m long by 1.5 m wide by 30 m deep averaging 0.32 ounce Au per ton and 0.94% Cu<br>15 000 tons of 0.24 ounce Au per ton estimated in the C Zone. | Gladys Stephens Kenora, MLS                         | OFR 5695,p.101<br>OFR 5695,p.101<br>OFR 5695,p.101<br>Sherritt Gordon Mines Ltd., AF | Inactive Lease<br>K23942, K23943  |
| Electrum Prospect--P Zone (Electrum Fault Zone or Porphyry Zone) (52E/11NE) | Au        | 30.5 m long by 30.5 m wide by 3.4 m deep averaging 0.40 ounce Au per ton.  | Nellie R. Alcock,<br>Surrey, B.C. MLS               | OFR 5695, p.106  | Inactive Lease<br>K20695  |
| Electrum Prospect-W Zone (Fault zone or West Zone) (52E/11 NE)              | Au        | 61 m long by 2.1 m wide by 19.8 m deep averaging 0.23 ounce Au per ton.<br>100 000 tons of 0.33 ounce Au per ton in the P & W zones combined.  | Unknown   | OFR 5695,p.108<br>Laramide Resources Inc. Annual Report, 1987                        | Inactive Leases<br>K20696-K28663  |
| Errington Prospect (52F/6SW)  | Au        | 24 000 tons of 0.73 ounce Au per ton in a zone 450 feet long by 32 inches wide by 240 feet deep.   | Lawrence Mattson<br>Linnstrom, Minn.<br>U.S.A., MLS | MDC 16, p.16   | Inactive K7181,<br>7183, 7184, 7186   |
| Evenlode Prospect (Eco Occurrence) (52E/11NE)                               | Mo, Au    | 126 000 tons of 0.68% MoS <sub>2</sub> and 0.015 ounce Au per ton. Indicated: 200 000 tons of 0.63% MoS <sub>2</sub> ; Inferred: 550 000 tons estimated to a depth of 800 feet.  | NM 11/11/65 (Evenlode Mines Ltd.)                   | OFR 5695,p.114   | Inactive Patents<br>K8705, 8707,<br>claim 1150113   |
| Flambeau Lake Prospect (52F/10NW)   | Au        | Diamond drilling partially outlines a zone with potential for 572 000 tonnes (gold grade unstated).  | Alex Kozowy, Dryden, PC                             | AF   | Inactive Patent<br>AL88   |
| Flint Lake Prospect (52F/5SW)   | Au        | 148 000 tons @ .235 opt.<br>62 500 tons @ .260 opt.<br>50 000 tons @ .200 opt.   | P. Dubenski, Kenora<br>PC                           | AF   | Lease   |
| Foley Mine (52C/10NE)   | Au        | 40 000 tons @ 0.5 opt proven/probable;<br>400 000 tons @ 0.5 opt speculative.  | R. Cone,<br>Fort Frances                            | NM 09/25/80 (Seaforth Mines Ltd.)<br>OFR 5539, p.194                                 | Advance Exploration in 1993<br>50-ton bulk sample from Bonanza vein by Nipigon Gold; Patents<br>K475101,<br>475102,475103 |
| Gaffney Prospect (52F/7SW)  | Au        | 300 000 tons of 0.15 ounce Au per ton .  | San Paulo Expl. Inc. (CMH, 1990-91, p.393)          | CMH, 1990-91, p.393  | Inactive patents<br>K3594, 3595   |

**Table 6.** cont'd. Mineral deposits not being mined in the Kenora District in 1997.

| Deposit Name/NTS  | Commodity  | Tonnage-Grade Estimates and/or Dimensions  | Ownership References  | Reserve References  | Status  |
|---|------------|--|---|---|---|
| Golden Star Mine (52C/10NE)   | Au         | 10 000 tons of 0.45 ounce Au per ton<br>20 000 tons of 0.42 ounce Au per ton and<br>35 000 tons of 0.15 ounce Au per ton in<br>tailings dump.                                    | PIRP Holdings Inc.<br>AF  | OFR 5512, p.44<br>MDC 16, p.20  | Inactive Patent<br>AL116<br>Lease K44632                                    |
| High Lake Prospect (52E/11NE)   | Cu, Mo, Au | 2000-foot long by 250-wide zone con-<br>taining assay values of 0.10% to 1.35%<br>Cu and 0.01 to 0.05 ounce Au per ton.  | Unknown   | GR 41, p.46   | Inactive lease<br>K32307  |
| Kenbridge Prospect (52F/5NE)  | Ni, Cu     | 3 271 390 tons of 1.06% Ni and 0.54%<br>Cu.  | CMH, 1986-87,<br>p.209, (Falconbridge<br>Limited)                   | GR 111, p.44  | Inactive Patents<br>K6672, 6634, 6635                                       |
| Mavis Lake Prospect (52F/15SE)  | Li, Ta     | 500 000 tons of 1% Li <sub>2</sub> O.  | CMH, 1995-96,<br>p.262, (New Clay-<br>more Resources<br>Ltd.).      | OFR 5718, p.151   | Inactive Lease<br>K498288,498289,<br>498290,498292,<br>498308,498140        |
| Maybrun Mine (52F/5NE)  | Cu, Au     | 2 824 825 tons of 1.18% Cu and 0.08<br>ounce Au per ton including 1 508 454<br>tons of 1.48% Cu and 0.11 ounce Au per<br>ton.  | CMH, 1995-96,<br>p.108 (Consolidated<br>Maybrun Mines Lim-<br>ited) | GR 111,p.36   | Inactive;Care and<br>Maintenance Patent<br>K15364-K15381,<br>K15524- K15527 |
| Mironsky Pros-<br>pect (52C/11NE)   | Cu         | 400 feet long by 35 feet wide zone to a<br>minimum depth of 300 feet averaging .53<br>to 1.01% Cu. 300 000 tons of 0.8% Cu<br>(estimated).                                       | Open  | GR 115,p.59   | Inactive  |
| New Campbell<br>Island Mines<br>(Richard Lake)<br>Prospect<br>(52F/13SW)      | U          | 650 000 tons of 0.10% U <sub>3</sub> O <sub>8</sub> in a zone<br>700 feet long by 10 feet wide and 1000<br>feet deep.  | Unknown   | GR 130,p.46   | Inactive Patent<br>K18761   |
| Norpax (Re-<br>ynar Lake)<br>Prospect<br>(52L/6NE)                            | Ni, Cu     | 1 010 000 tons of 1.2% Ni and 0.5% Cu.   | CMH, 1995-96,<br>p.149 (Falcon Point<br>Resources Ltd.)             | Norpax Nickel<br>Mines Ltd., AF   | Inactive Patent<br>KRL350101,<br>KRL34767                                   |
| Northrock<br>(South Grassy)<br>Prospect – Bea-<br>ver Pond Zone<br>(52C/11NE) | Cu         | 1 020 458 tons of 1.17% Cu over a strike<br>length of 400 m including<br>265 230 tons of 2.08% Cu over a length<br>of 300 m (all estimates valid to a vertical<br>depth of 91m). | Nor-Norock Mining<br>Company Limited                                | OFR 5512, p.50  | Inactive Lease<br>K12314, K12315,<br>K12319, K12320                         |
| Olive (Preston)<br>Mine<br>(52C/15SE)   | Au         | 12 5000 tons of 0.34 ounce Au per ton in<br>2 mineralized shoots and 1100 tons of<br>broken ore averaging 0.31 ounce Au per<br>ton in the second level stope.                    | CMH, 1995-96,<br>p.269, (Noront Re-<br>sources Inc.)                | NM 05/18/87, p.6,<br>NM 06/29/ 87, p.21<br>(HSK Minerals<br>Ltd.), AF       | Inactive Lease<br>K475146, 475193,<br>475269, 475190,<br>475191, 475192     |
| Purdex Pros-<br>pect (A-D<br>Zones)<br>(52E/11NE)                             | Au         | 76 500 tons of 0.308 ounce Au per ton<br>(combined indicated tonnage in 4 zones).<br>241 000 tons at 0.226 ounce Au per ton in<br>the P,A,B and C zones.                         | CMH,1995-96,<br>p.233, (Locke Riche<br>Minerals Ltd.)               | OFR 5695, p.273<br>CMH, 1995-96<br>p.233, (Locke<br>Riche Minerals<br>Ltd.) | Inactive Patents<br>K25130,K25131   |
| Regina Mine<br>(52E/8NE)  | Au         | Speculative 19 650 tons of 0.44 opt.<br><br>30 000 tons at 0.106 ounce Au per tons in<br>tailings.   | Unknown   | Lodi Metals Inc.<br>AF;<br>NM 07/25/88, p.7<br>(Sweaney Gold<br>Corp.)      | Inactive Patent<br>P566, P567   |

**Table 6.** cont'd. Mineral deposits not being mined in the Kenora District in 1997.

| <b>Deposit Name/NTS</b>                | <b>Commodity</b> | <b>Tonnage-Grade Estimates and/or Dimensions</b>  | <b>Ownership References</b>                 | <b>Reserve References</b>   | <b>Status</b>   |
|--|------------------|---|---|---|---|
| Scramble (Homestake) Mine (52E/16SW)   | Au               | 1200- to 1500-foot long by 12 foot wide zone averaging 0.15 ounce Au per ton. 150 000 tons at 0.24 opt and 1500 at 0.24 opt and 70 000 ounces (using cut-off @ 0.05 opt.) drill indicated.            | Boise Cascade Corporation, PC               | NM 07/25/88 (Madeline Mines Ltd.) CIMM, Dist.4 Field Trip Guidebook, p.44 | Inactive Underground development (1988-89) Jaffray Twp., Con.6, Lot 13 and 14 |
| Tabor Lake Mine (52F/9SW)              | Au               | Possible 14 000 @ 0.41 opt; Speculative 3000 @ 0.41 opt.  | Sulpetro Minerals Ltd., AF                  | OFR 5332, vol.1, Table 12   | Inactive 37 claims - 502044 (site)  |
| Vanlas Prospect (Kidd Zone) (52F/10NW) | Au               | 100 000 tons of 0.20 ounce Au per ton   | Power Expl. Inc. Annual Report, 1988        | Power Expl. Inc. AF   | Inactive Patent K70627  |
| Victor Island Prospect (52F/5SE)       | Au               | Drill indicated reserves: 300 000 tons at 0.12 ounce Au per ton to a depth of 700 feet.   | CMH, 1995-96 p.275 (Nuinsco Resources Ltd.) | MP 128, p.16  | Inactive Patent 4712 Claims 690655, 718785                                    |
| Virginia Prospect (52F/5NE)            | Au               | 100-foot wide zone averaging 0.10 ounce Au per ton.   | Unknown                                     | G111, p.40  | Inactive Patent F.M.73A   |
| Wind Bay Prospect (52C/10 SW)          | Zn, Cu           | 1300 m long by 50 m wide zone hosts several 10 m wide mineralized lenses. Typical diamond drill hole intersections assayed 1.5% Zn, 0.2% Cu and 1.1% Zn, 0.09% Cu across 7 m and 8.6 m, respectively. | George Armstrong, Fort Frances, PC          | OFR 5512, p.89  | Inactive  |
| Witch Bay Occurrence (52E/9SE)         | Au               | 8.2 g/t Au to 29.5 g/t Au across 30 to 36 cm for a length of 240 m.   | G. Pogson, Thunder Bay, MR, Kenora          | OFR 5695, p.370   | Claim 1125631   |

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# Metric Conversion Table

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

## OTHER USEFUL CONVERSION FACTORS

|                                | <i>Multiplied by</i> |                               |
|--------------------------------|----------------------|-------------------------------|
| 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.*





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