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Ontario Geological Survey
Open File Report 5973

Report of Activities, 1997 Resident Geologist Program

Kirkland Lake Regional Resident Geologist's Report: Kirkland Lake–Sudbury Districts

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Kirkland Lake–Sudbury Districts

by

G. Meyer, M. Cosec, G.P.B. Grabowski, D.L. Guindon, S. Buckley and C.L. Messier

1998

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ONTARIO GEOLOGICAL SURVEY

RESIDENT GEOLOGIST PROGRAM – 1997

KIRKLAND LAKE REGIONAL RESIDENT GEOLOGIST'S DISTRICT

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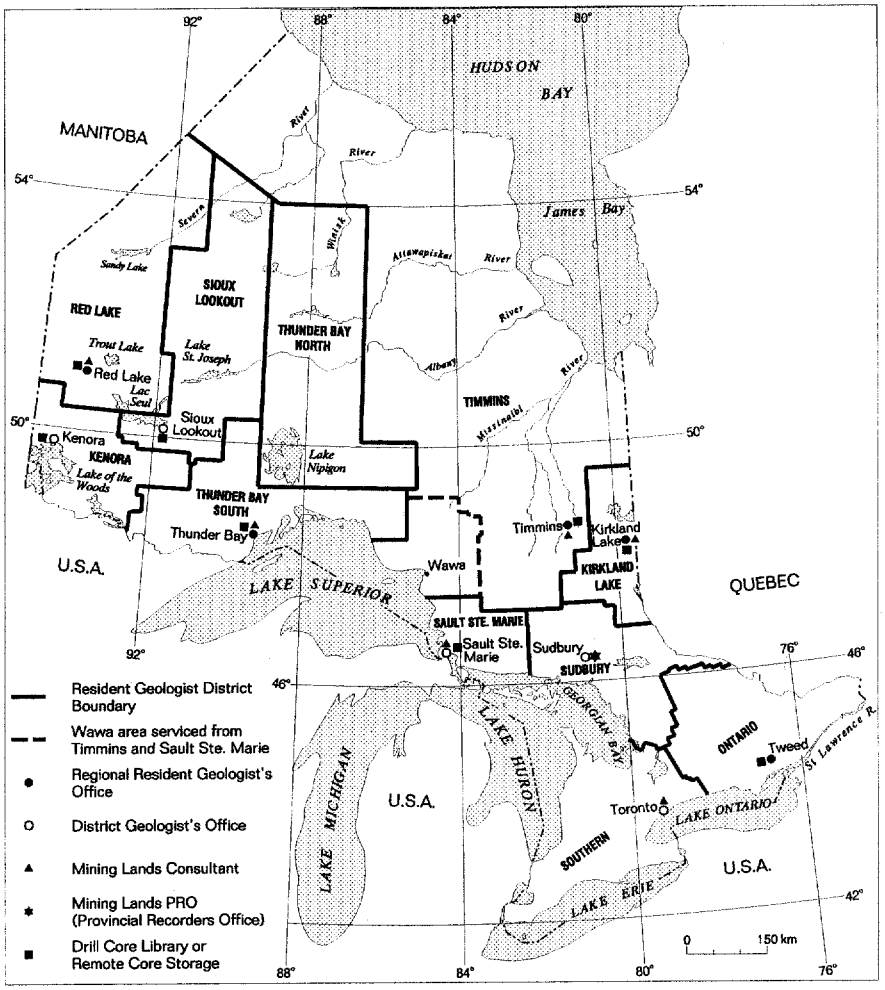

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ONTARIO GEOLOGICAL SURVEY
Resident Geologist's Program – 1997

Kirkland Lake Resident Geologist's District

by

G. Meyer, G.P.B. Grabowski, D.L. Guindon and C.L. Messier

1998

Kirkland Lake District – 1997

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Introduction

1997 started out as a promising year for exploration, advanced projects and mining. A drop in the gold price caused a significant reduction in exploration for this commodity. Underground rock bursts and a mill break down substantially reduced the anticipated gold production for the year. Combined gold production from the areas' three gold mines, three advanced exploration projects and one tailings reclamation operation produced 282 262 ounces of gold, an increase of 11.6% from the previous year. In addition an underground barite mine and an open pit hedmanite mine operated in the Kirkland Lake Regional Resident Geologist's District. Total historic gold production in the Resident Geologist's Kirkland Lake District is 39 867 045 ounces of gold recovered from 129 578 487 tons of ore and 170 889 ounces of gold from 3 732 980 tons of tailings. Current resources and reserves contain more than 10 million ounces gold.

Two rock bursts at Kinross Gold Corporation's Macassa Mine damaged the lower section of the main shaft, causing the loss of access to the deeper levels, reduction of ore reserves and the consequent scaling back of mining operations. A breakdown in the grinding circuit at Barrick Gold Corp.'s Holt-McDermott mill caused a temporary set back in production for Barrick's Holt-McDermott Mine and Battle Mountain Gold's Holloway Mine.

Two bulk sampling programs were under way in 1997. Exall Resources Limited completed a bulk sampling project and the Glimmer Mine is scheduled to commence commercial production on New Year's day, 1998. Bulk sampling by the Jonpol joint venture (Hillsborough Resources Limited, Jonpol Explorations Ltd. and T&H Resources Ltd.) was not successful.

Sudbury Contact Mines Limited scaled back on underground development and exploration at their Victoria Creek project and further development work and exploration at Royal Oak Mines Inc.'s Matachewan project was suspended.

Gold resources were substantially increased at St Andrew Goldfield Ltd.'s three mine sites, Franco-Nevada Mining Corporation Limited and Queenston Mining Inc.'s McBean mine site and Armistice Resources Ltd.'s Armistice property.

Cross Lake Minerals Ltd. made a volcanogenic base metal sulphide discovery in Sheraton Township. Follow-up exploration along favourable stratigraphy containing the discovery has spilled over into the Kirkland Lake Regional Resident Geologist's District. Also, the down dip/plunge copper and zinc potential at the Potter Mine (past producer) was tested in a deep diamond-drill hole by Millstream Mines Ltd.

The Kirkland Lake Regional Resident Geologist's District maintained a high level of activity throughout 1997. There were at least 175 active exploration projects (Tables 3a, 3b & 4) and 340 Assessment Work records were processed and incorporated into the assessment file system (Tables 3a & 3b). In addition, 36 literature titles were added to the library database (Table 6).

53 Ontario Prospectors Assistance Program (OPAP) projects were designated within the Kirkland Lake Resident Geologist's Region (Cobalt and Kirkland Lake Districts).

Active claims for the Larder Lake Mining Division at the end of 1997 totaled 12 887 (37 083 units) an increase of 8% over last year.

Mining Activity – Precious Metals

AJ PERRON GOLD CORP. – KERR MINE

The Kerr Mine was forced to close when it could not afford to pay an estimated $2.1 million in back taxes to the municipality of McGarry Township, and approximately $1 million to Ontario Hydro. The mine shut down in August of 1996, and as a result 130 people were permanently laid off. By the end of 1997, 49 of these laid-off workers found employment with other companies.

The township of McGarry seized the company's surface assets under the Municipal Sales Tax Act, and auctioned off surface equipment, vehicles, the mill, and the headframe. A.J. Perron Gold Corp., along with three sister companies, have launched a $160 million lawsuit against the town for wrongful seizure of property; stating that some assets sold were not part of the surface rights, but part of the mining rights, which the company still owns. In July 1997, the headframe was torn down.

BARRICK GOLD CORPORATION - HOLT–MCDERMOTT MINE

In 1997, Barrick Gold Corporation milled 461 478 tons of Holt-McDermott's ore yielding 116 474 ounces of gold or the equivalent of a recovered grade of 0.253 ounces per ton. Recovery was 96.5% and the cost per ounce was US$ 139.00.

Underground development included 16 489 feet of drifting and 1264 feet of raising. Underground diamond drilling totalled 95 590 feet in 194 drill holes. Of this drilling, 43% was dedicated to exploration and 57% to ore definition.

Total reserves calculated in January 1998 are 4.6 million tons grading 0.195 ounces per ton Au. This includes 2.8 million tons in the South Zone grading 0.207 ounce Au per ton.

Capital expenditures for the year amounted to $ 6.0 million, including $ 0.7 million for exploration. The company has budgeted $ 1.0 million for diamond drilling in 1998.

At the end of 1997 the company offered an early retirement incentive to its employees in an effort to reduce its workforce to 183 people from a compliment of 198. Barrick also announced intentions to scale back development by approximately 25%.

In September, a mechanical breakdown in the company's grinding circuit caused a temporary set back in production for the mine as well as for Battle Mountain's Holloway mine which has a ten year milling agreement with the Holt-McDermott mill (J. Boutin, personal communication, 1998).

Web site: www.barrick.com

BATTLE MOUNTAIN GOLD AND TEDDY BEAR VALLEY MINES LIMITED – HOLLOWAY MINE

In its first full year of commercial production, Battle Mountain Gold and Teddy Bear Valley Mines Limited's Holloway mine in Holloway Township produced an average of 1050 t of ore per day. 650 t per day of this ore were milled at the Holt-McDermott mill, while Kinross' Macassa mill processed approximately 400 t per day. In 1997, the mine had 362 500 t of ore custom milled to produce 62 800 ounces of gold at an equivalent recovered grade of 0.157 ounce Au per ton. A 95% recovery rate for 236 000 t milled at the Holt McDermott mill and 94% recovery rate for 126 000 t milled at the Macassa mill were achieved. The Holt-McDermott mill was seriously affected by a mechanical failure in one of the grinding units. This resulted in a Holloway production loss of 65 000 t milled and a temporary lay-off of 45 employees.

Proven and probable reserves on December 31, 1997 were 5 317 000 t grading 0.195 ounce Au per ton or containing 1 145 000 ounces of gold. With the present reserves, the mine is expected to produce about 100 000 ounces of gold for the next 11.5 years. At the end of 1997, the company employed 118 people (Richard Labine, Personal communication, 1998).

Battle Mountain Gold's web site: www.bmgold.com

KINROSS GOLD CORPORATION – MACASSA MINE

In 1997, Kinross Gold Corporation's Macassa mine produced 37 885 ounces of gold from 101 842 tons of ore for an average recovered grade of 0.386 ounce Au per ton. Mill recovery was 96.3%. The Macassa mill processed a daily average of 331 tons of Macassa ore, 717 tons of tailings and 468 tons of Battle Mountain Gold's Holloway Mine ore.

On April 12, 1997, two rockbursts registering 3.8 and 3.7 on the Richter scale drastically changed the operating plan for the Macassa operations. A series of bursts triggered by a longhole blast in stope 6638 resulted in extensive damage throughout the mine. This damage extended from the 5400 Level down to the 6900 Level of the mine, and included severe damage to the No. 3 Shaft at the 6000 foot elevation. This resulted in the mine being shutdown until June 1997. During the shutdown a new operating plan was developed for mining of the ore zone above the 5000 foot elevation. This plan included the excavation and construction of a loading pocket at the 5150 foot elevation and an underground exploration program, employing six diamond drill machines, testing for potential auriferous zones above the 5000 foot level. Approximately 45 000 tons of material grading over 0.55 ounce Au per ton were defined. Despite the rockbursts, gold production for the third quarter exceeded 1996's third quarter production by 3%.

In 1998, the company plans to spend over $2 million on delineating additional reserves in the vicinity of the No. 3 Shaft. A new mining level will be established with 2500 feet of lateral development planned on the 3800 Level. The production target for 1998 is 75 000 ounces of gold, a 25% increase over 1997.

Mineable reserves at Macassa for the end of 1997 are estimated at 409 676 tons at 0.54 ounce Au per ton above the 5000 foot level. (M. Sutton, Personal Communication, Jan. 20, 98).

Web sites: www.macassa.com & www.kinross.com

KINROSS GOLD CORPORATION – LAKE SHORE CROWN PILLAR

Kinross Gold Corporation also started to mine the Lake Shore Mine crown pillar early in December. At the end of 1997 the company produced 7928 ounces of gold from 18 818 tons at 0.421 ounce Au per ton. Recovery was approximately 96% (M. Sutton, personal communication, 1998).

KINROSS GOLD CORPORATION – LAKE SHORE TAILINGS PROJECT

In 1997, Kinross Gold Corporation's Lakeshore Tailings Project produced 11 207 ounces of gold from 261 863 tons of tailings which is equivalent to a recovered grade of 0.0723 ounce Au per ton. Mill recovery was 59.2% (M. Sutton, personal communication, 1998).

Mining Activity – Industrial Minerals

EXTENDER MINERALS OF CANADA LTD.

Extender Minerals of Canada Ltd. produced approximately 15 000 tons of barite in 1997. The Company has 2 years of reserves at the mine located in Yarrow Township and plans to conduct extensive exploration on the mine property (R. Hill, personal communication, 1998).

HEDMAN RESOURCES LTD.

Hedman Resources Ltd. produced 3500 tons of hedmanite, a lizardite mineral filler, from their open pit site in Warden Township. Proven reserves at the mine site are approximately 9 million t. In 1997, the company employed up to 12 people (R. Bertrand, personal communication, 1998).

Advanced Exploration – Precious Metals

ARMISTICE RESOURCES LTD. – ARMISTICE PROPERTY

1997 has been a year of extensive underground diamond drilling for Armisitice Resources Ltd. After receiving financing of $7.1 million, the company set out to determine if the possible down-faulted extension of the Kerr Formation continues onto the Armisitice property. By the end of 1997, the company reported the following progress: drifting of 1500 feet to the west and 400 feet to the east of the shaft on the 2250 foot level, 97 000 feet of diamond drilling from 32 drill stations on the 2250 foot level and a 5379-ton bulk sample processed at Kinross Gold Corporation's Macassa mill. The bulk sample produced 455 ounces of gold (at a head grade of 0.0846 ounce Au per ton and a recovery of 70.6%).

The drilling has confirmed the presence of seven mineralized zones similar to the Kerr "flow ore". Notable intersections include 30 feet (true width) grading 0.11 ounce Au per ton and 17.2 feet (true width) grading 0.653 ounce Au per ton. The results of this program outlined an estimated resource of 4 228 650 tons, with an average grade of 0.198 ounce Au per ton. The company is confident that the property contains the down-faulted Kerr Formation, and is encouraged by the increasing gold grade at depth. Definition drilling is continuing into 1998 (G.J. Hinse, personal communication, 1998).

Web site: www.armistice-resources.com

EXALL RESOURCES LIMITED AND GLIMMER RESOURCES INC. – GLIMMER MINE

The Glimmer Mine, operated by Exall Resources Limited, is located 8 km east of Matheson in Hislop Township. Processing of ore from the Glimmer gold project commenced in late March at St Andrew Goldfields' mill in Stock Township. Under a 3-year agreement, St Andrew will mill a minimum of 150 000 t per annum. Commercial production is scheduled to commence on New Years day, 1998. In the third quarter, production at the mine exceeded original forecasts by 30%, putting the operation on target to meet its 65 000-ounce annual production schedule. Reserves at the mine stand at 698 000 t grading 12.8 g/t or containing 8 945 920 g (287 618 ounces) gold. In 1997 the company had 214 000 tons of ore processed to produce 40 334 ounces of gold at a recovered grade of 0.188 ounce Au per ton.

Underground workings are accessed by a spiral decline ramp to a depth of 120 m. During 1997 the company completed 2000 m decline advancement, 3800 m drifting, 12 000 m surface drilling and 10 800 m underground drilling.

There is uncertainty over the extent of Exall's 65.53% interest in the mine. Glimmer Resources Inc. took Exall to court, arguing that Exall suffered a dilution of its interest because it had failed to contribute its share of cash to the joint venture in late 1996 and early 1997. Justice Rosenberg upheld Glimmer's contention that the calculation of expenditures used to determine the parties' equity interests of expenditures should be based solely on cash expenditures. The share of ownership is to be determined by a judicial officer. Exall served notice that it may appeal the judge's ruling on its joint venture agreement with Glimmer Resources (Kirkland Lake Gazette, Dec. 12, 1997, p. 20 and Exall Press Release, Nov. 1997).

For more information see section on Glimmer gold mine under Property Examinations in this report.

Web Site: www.exall.com

HILLSBOROUGH RESOURCES LIMITED, JONPOL EXPLORATIONS LTD. AND T&H RESOURCES LTD. – JONPOL JOINT VENTURE

Hillsborough Resources Limited, the operator of the Jonpol Joint Venture, shipped 55 000 tons of material to Noranda Inc. in Rouyn, Quebec from October 1996 to March 1997. The material processed returned a grade of 0.176 ounce Au per ton. Of this bulk sample, 32 760 tons were shipped in 1997 and 5180 ounces of gold were recovered. This is equivalent to a recovered grade of 0.158 ounce Au per ton. Due to custom milling costs and the gold price, the company ceased making further shipments. A spiraling ramp was driven for 2500 feet to a depth of about 460 feet below surface. Drill indicated reserves stand at 450 000 tons grading 0.28 ounce Au per ton (Kirkland Lake Gazette, January 29, 1997, p. 14 and Jonpol Explorations Limited, Project Progress Report, April 10, 1997).

NFX GOLD INCORPORATED – CHEMINIS MINE

In 1997, NFX Gold Inc. concentrated mainly on underground exploration on their past-producing Cheminis Mine property in McVittie Township. The company's work during the year doubled their reserves/resources from 992 742 tons grading 0.195 ounce Au per ton to 2 088 826 tons grading 0.184 ounce Au per ton. The increase has been accounted for as follows:

1. Improvement and computerization of the diamond drill hole database revealed economic zones which were not previously recognized, such as the Carbonate Gold Zone (in the hanging-wall of the "C" Zone) and the North "D" Zone (in the foot-wall of the "D" Zone). Reserves were also added to the "A" and "C" Zones.
2. The North Sediment Gold Zone (previously known as the Sediment Gold Zone) was significantly expanded by diamond drilling and remains open along strike.
3. A new sediment-hosted gold deposit, named the South Sediment Gold Zone was discovered and is open along stike. This zone is located approximately 50 feet south of and parallel to the North Sediment Gold Zone. Some intersections released for this zone include the following: 0.2 ounce Au per ton over a true width of 27 feet, 0.162 ounce Au per ton over a true width of 4.05 feet, 0.141 ounce Au per ton over a true width of 6.43 feet, and 0.134 ounce Au per ton over a true width of 9 feet.

Plans for 1998 include continuing exploration of the two sediment-hosted gold zones and deep diamond drilling of the "D" and North "D" Zones (NFX News Release, September, 1997 and Les Tihor, personal communication, January 1998).

ROYAL OAK MINES INC. – MATACHEWAN PROJECT

The Matachewan project has been put on hold due to a considerable decline in the value of gold. The project has been placed on care and maintenance of the shaft and critical entities, and is being kept on operational stand-by in order to resume development as soon as the price of gold reaches an acceptable level. When the project was put on hold, the former Matachewan Consolidated shaft had been dewatered to 1200 feet below surface (ninth level) (Northern Daily News, November 15, 1997, p. 9).

Web site: www.royal-oak-mines/matachewan.htm

SUDBURY CONTACT MINES LIMITED – VICTORIA CREEK ZONE

In 1997, Sudbury Contact Mines Limited completed shaft development on the Victoria Creek project. Water problems, encountered earlier in the year, caused slight delays in the project.. The shaft reached its planned depth of 524.6 m, by early September 1997. Eight stations were developed in the shaft and a total of 805 m of development drifting conducted on the 200, 350, and 450-m lev-

els. A total of 12 000 m of underground diamond drilling is planned in 1998 to better outline gold mineralized zones. Sudbury Contact Mines Limited is also planning 250 m of drifting on the mineralized zones on the 350-m level for a possible bulk sample.

At the end of 1997, the Victoria Creek project employed 35 people (K. Montgomery, personal communication, 1998).

Advanced Exploration – Industrial Minerals

EXTENDER MINERALS OF CANADA LTD. – NORTH WILLIAMS TOWNSHIP

In 1996, a decline ramp was started at their property in North Williams Township in the Shining Tree area. Ramp development was completed for a distance of 230 feet from the surface. Another 60 feet of decline development, drifting and bulk sampling is planned for 1998 (R. Hill, personal communication, 1998).

Exploration Activity

BARRICK GOLD CORPORATION, MONETA PORCUPINE MINES LTD. AND NUFORT RESOURCES INC. – MICHAUD PROPERTY

Throughout the year, Barrick Gold Corporation has been diamond drilling on the Michaud and Nufort gold properties, 30 km east of Matheson. In 1997, a total of 22 270 m were diamond drilled on the property. Barrick spent approximately $2.5 million on exploration and definition drilling to add confidence to widely spaced drilling completed in the previous year which outlined a zone containing about 2.4 million tons at a grade of 6.07 g/t gold. The properties are presently being re-evaluated due to the low gold price (J. Boutin, personal communication, 1998).

Barrick Gold Corporation needs to spend $3.5 million on exploration to earn a 60% interest in the Michaud property, which is wholly owned by Moneta Porcupine Mines Ltd.

FRANCO-NEVADA MINING CORPORATION LIMITED AND QUEENSTON MINING INC. – KIRKLAND LAKE JOINT VENTURE

In 1997, Queenston Mining Inc. and Franco-Nevada Mining Corporation completed a $2.5 million, 42-hole (92 000 foot) deep diamond-drilling program, part of an extensive exploration project dedicated to testing the possible depth extension to the Anoki and McBean deposits. The two-phased deep-exploration effort failed to extend the known deposits. However, continued drilling beyond the deposits led to the discovery of two new gold mineralized zones; the Anoki Deep Zone and the McBean Green Carbonate Zone. Wide spaced drilling was concentrated on these two targets. Results of the Anoki drilling extend the deep zone over a strike length of 2000 feet and to a depth of 2000 feet. This zone remains open and the companies plan to continue their efforts to delineate this find during the first quarter of 1998. Drilling on the McBean Green Carbonate Zone has discovered a gold mineralized zone with an estimated resource of 1 225 000 tons averaging 0.22 ounce Au per ton (cut to 1oz.). Combined with the existing resource of the McBean Dike Zone (1 718 9000 tons at 0 .15 ounce Au per ton), the McBean now contains an indicated and inferred resource of 527 000 ounces of gold (2 943 900 tons @ 0.18 ounce Au per ton).

For the first quarter of 1998, Franco Nevada has committed $400 000 to further explore the Larder Lake Break, including more definition drilling on the Anoki Deep zone. This investment will complete their $2.5 million earn-in obligation, at which point they will become fully vested in the Kirkland Lake Joint Venture, a 50-50 partnership owning 100% interest in 678 mineral claims. The joint venture property has a fully permitted 500 – 700 ton per day gold mill, and resources of 1.44 million ounces of gold.

Queenston's web site: www.queenston.ca

McWATTERS MINING INC. – RAMP VEIN PROPERTY

McWatters Mining Inc. conducted a diamond drilling program on its Ramp Vein property, formerly known as Maude Lake Gold Mines property, near Matheson. 33 holes totalling 7450.5 m were drilled to better define the Ramp Vein and Zone 4 gold structures. The first phase of drilling focused on defining the Ramp Vein structure close to surface, whereas the second phase was aimed at defining lateral and depth extensions of the Ramp Vein, Zone 4, as well as the No.2 and Shaft veins.

Although the first phase was unsuccessful at intersecting the Ramp Vein close to surface, the second phase succeeded in better defining the Ramp Vein and Zone 4 gold structures. Significant extensions were revealed and encouraging intersections were encountered. Notable intersections included;

22.2 g/t Au over a true width of 1.1 m, 8.98 g/t Au over a true width of 5 m, 11.46 g/t Au over a true width of 2.5 m, 8.65 g/t Au over a true width of 3.2 m, and 35 g/t Au over a true width of 0.3 m (McWatters, 1997 Drilling Programme, Assessment Work, KL-4237, October 1997).

Web site: www.info-mine.com/mcwatters

MILLSTREAM MINES LTD. – POTTER MINE

Millstream Mines Ltd. diamond drilled a deep hole on their Potter Mine (past producer) property in Munro Township. The hole was designed to test the possible down dip/plunge extension of the previously mined copper-zinc orebody. Evidence from previous findings pointed to the possibility of a lengthening and widening resource with an improved grade at depth. Drilling from surface below the mine's lowest past producing level of 1100 feet revealed three significant copper-zinc sulphide zones in one diamond-drill hole which returned the following intersections: 2.46% Cu, 1.88% Zn, over 2.6 m; 1.52% Cu, 3.98% Zn, over 6.9 m; 3.74% Cu, 2.49% Zn, over 3.6 m. Two minor copper-zinc mineralized zones were also intersected in the same hole at depths between 1400 and 1891 feet (Millstream Mines Limited News Releases, March 10, April 28, 1997, July 17, October 23, November 28, December 16, and December 23, 1997).

PANGEA GOLDFIELDS INC. – FENN-GIB GOLD PROJECT

In March of 1997, the company declared intentions to begin underground development at the Fenn-Gib gold project near Matheson. Plans have been put on hold. The measured and indicated resource at a 3.0 g/t Au cut-off, to 250m level and 15% dilution stands at 1.95 million tons grading 5.13 g/t Au (Pangea Goldfields Inc., Second Quarter, 1997).

SEDEX MINING CORP. AND ABITIBI MINING CORP. – TANNAHILL PROJECT

Abitibi Mining Corp. and Sedex Mining Corp. are further evaluating a gold discovery made in 1996 on their joint-venture Tannahill project. Two gold-bearing alteration zones were discovered and remain open along strike and at depth. In their 1997 drilling, Sedex and Abitibi succeeded in intersecting the gold-mineralized structures in almost every hole. Notable intersections include; 4.83 g/t Au over 1.9 m, 4.54 g/t Au over 2 m, and 5.21 g/t over 1.75 m.

Geophysical surveys profiled the main structure over an approximate 3 km of strike length, and over 10 geochemical anomalies have been revealed. Mechanical stripping and sampling over some of these anomalies returned gold assays of up to 3.5 g/t Au.

Testing the strike and dip extensions of this gold mineralized zone is planned for 1998 (Sedex Mining Corp. News Release, January 9, February 18, April 14, and September 26, 1997; and www.sedex.com/ontario.html January 13, 1998).

Sedex's web site: www.sedex.com

SEDEX MINING CORP. – OKA PROJECT

Sedex Mining Corp. discovered four new gold zones on its 100% owned Oka Project, situated 1.5 km north of Royal Oak Mines Matachewan Project. Mechanical stripping over notable geological and geochemical anomalies (including 1.0 g/t Au in soils), has exposed four new gold-bearing structures along the north sediment/volcanic contact area. Gold values as high as 32.30 g/t Au have been returned from quartz veins within a syenite intrusion. Additional gold values up to 15.18 g/t Au have been returned from parallel structures exposed in trenches along 400 m of strike length. Significant diamond drilling has been planned to further evaluate the potential of this discovery.

As a result of the discovery of these new gold zones, Sedex Mining Corporation has completed an option agreement to acquire 100% interest in the Oka 5 Property. This four claim gold property, in Powell and Cairo townships, is located immediately north of the discovered gold zones and increases the overall area of the project by approximately 33%. No previous work has been done on the new property. (Sedex Mining Corporation – News Release, October 2 and 29, 1997)

Web site at: www.sedex.com

SILVER CENTURY EXPLORATIONS LTD. – OSSIAN TOWNSHIP

In 1997, Silver Century Explorations undertook a diamond drilling project to evaluate new geophysical targets and a gold-bearing quartz vein zone near the old Ossian Gold Mine in Ossian Township. The most significant result from this drilling endeavour was an intersection of 2.72 m grading 4.59 g/t Au. Drilling of geophysical anomalies on the property indicate that the southern anomaly is a major pyritic horizon that extends for 2.2 km. Whole rock analysis of the drill core suggests a stratigraphic sequence of favourable VMS deposit potential. A deep penetrating electromagnetic survey and 1500 m of diamond drilling are planned for 1998.

(www.newswire.ca/releases/January1998/13/c2538)

ST ANDREW GOLDFIELDS LTD. – STOCK, TAYLOR AND HISLOP MINES

St Andrew Goldfields Ltd. has a 1000-ton per day CIP mill located in Stock Township, 22 km east of Matheson and three permitted mine sites. The ore deposits of the Stock, Taylor and Hislop mines occur within or are proximal to the Porcupine-Destor Fault Zone. Since 1989, St Andrew has produced 154 000 ounces of gold from its Stock and Hislop Mines and has sunk an exploration shaft at the Taylor Mine property to a depth of 215 m. The Stock, Taylor and Hislop mine properties cover 40 sq. miles and stretch 15 miles along the Porcupine-Destor Fault system.

In 1997, St Andrew Goldfields conducted exploration programs that include 152 758 feet of diamond drilling, Real Section IP geophysics and helicopter airborne EM-magnetics at a cost of $3.3 million. The Stock Mine is located in the Timmins Regional Resident Geologist's district and is not discussed in this section.

Exploration diamond drill results on the Taylor Mine property in Taylor Township indicate that a major gold system extends for at least 1.5 miles along the Destor-Porcupine Fault Zone. This gold system has been drilled from 1000 feet east of the Taylor shaft, across the West Porphyry Zone, to the Shoot Zone.

Diamond drilling of the West Porphyry Zone by March, 1997, resulted in a 5 fold increase in gold resources to 1 460 000 tons grading 0.28 ounce Au per ton. At this time the zone was estimated to measure approximately 500 feet in width, 1500 feet in length and an average thickness of 25 feet. Throughout the year, up to four diamond drill rigs probed the gold mineralized zone in 76 diamond drill holes totaling 135 124 feet. By August, 1997, results indicated a gold deposit measuring 2000 feet in length and 1000 feet in width. An updated resource estimate, including this year's diamond drilling, is under way and should be available soon. The zone remains open to the south and southwest.

15 diamond drill holes were completed this year, totaling 8085 feet, to verify the open pit potential of the upper part of the Shoot Zone, located one-half mile to the west of the West Porphyry Zone. An open pit is estimated to potentially provide 50 000 ounces of gold over a two-year period.

The company's plans for 1998/1999 include deepening the existing Taylor exploration shaft from a depth of 215 m to 700 m, drifting, closely spaced diamond drilling, and test mining. The design of a

150-man dry-shop-office complex for the Taylor Mine site has been commissioned and construction is planned for early 1998 (St Andrew Goldfields Ltd., News Releases, January 9, Sept. 8 & 24, 1997, Investor Exchange, March 1997, p. 62, and The Northern Miner, September 29, 1997, p. C10).

The Hislop Mine, in Hislop Township, from 1991 to 1994, produced 245 000 tons of ore averaging 0.162 ounce Au per ton down to a depth of 450 feet. A Real Section IP survey in 1996 identified several sub-parallel IP resistivity anomalies. Five diamond drill holes were completed, totaling 7647 feet. A new gold system was discovered at the western end of the property. Hole H-97-08 yielded an upper zone grading 0.09 ounce Au per ton over 4.9 feet and 0.10 ounce Au per ton over 14.8 feet. Diamond drilling along the Hislop Mine gold system to the northwest (Hiskerr claims) extended mineralization to the north boundary of the property. Hole H-97-10, drilled to straddle the boundary, intersected 32.1 feet grading 0.11 ounce Au per ton at a 350 feet depth. Drill testing below previous mine workings intersected gold mineralization over a core length of 9.8 feet grading 0.65 ounce Au per ton at a depth of 1500 feet (Investor Exchange, March 1997, p. 62, St Andrew Goldfields Ltd., Press Release, June 25, 1997 and M. Waychison, personal communication, 1998).

SUDBURY CONTACT MINES LIMITED – KIMBERLITE EXPLORATION

Sudbury Contact Mines Limited has been overburden and diamond drilling several kimberlite pipes in the Timiskaming area. A Lundy township pipe provided the best results thus far with a total of 52 diamonds found, 19 of which were macrodiamonds. These diamonds were collected from a 2400 pound sample. Exploration Diamond drilling has also taken place in Hearst and McElroy townships (Sudbury Contact Mines Limited, News Release, 3rd Quarter Report, 1997).

TANDEM RESOURCES LTD. AND NAR RESOURCES LTD. – GUIBORD TOWNSHIP

While diamond drilling a gold target in Guibord Township, Tandem Resources Ltd. intersected kimberlite at a depth of 359 feet. Micro-diamonds were discovered in a sample sent to the Lakefield Research Laboratory. Continued investigation of the sample for diamond indicator minerals then revealed the presence of 110 micro rubies. Two more holes were diamond drilled and two more samples processed, the number of rubies found reached 1790. Analysis of the rubies indicate that they are of very good colour saturation and could be described as an intense purplish red colour, similar to those found in Thailand and East Africa. Of these rubies, forty were classified as macro-rubies, varying in size from 0.8 to 2mm.

Tandem can earn an 80% interest in the property by spending $2 million by the year 2000. The company has already spent 25% of its commitment. (Tandem Resources Inc. News Releases, February 26, May 9, May 16, May 29, June 9, and June 17, 1997; Northern Miner, March 10 and October 20, 1997; Kirkland Lake Gazette, June 4 and September 26, 1997)

Tandem's web site: www.tandem.resources.com

TRANSPACIFIC RESOURCES INC. – MCGARRY TOWNSHIP

Transpacific Resources Inc., encouraged by promising drill results, exercised its option to purchase its McGarry property outright. The 68-claim property, which is located 1 mile north of the Kerr Mine, was probed by 24 diamond drill holes in 1997. The Instant Creek and South Gold zones remain open along strike and down dip. These zones consist of multiple lenses of mineralization that strike east-west, and dip steeply to the south. In all, 17 gold mineralised zones have been discovered, and intersections as high as 14 ounces Au per ton over 1.4 feet have been reported. To date expenditures on the property by Transpacific have reached nearly $1 million (Northern Daily News, March 7, October 17, 1997).

Resident Geologist Staff and Activities

The reorganization of the Resident Geologist's program resulted in numerous changes to the Kirkland Lake office. At year end, the staff consisted of G. Meyer, Regional Resident Geologist, D. Guindon, District Geologist, G. Grabowski, District Geologist, and C. Messier, Geological Assistant. D. Gerle, summer Experience Student, provided client service support and assistance to all staff. J. Ireland became the Northeast Regional Manager, Resident Geologist program and has relocated to Timmins. E. Basa and G. Quevillon have left the Ministry. F.M. Boucher was the successful competitor for the Administrative Assistant's position to the Regional Manager in Timmins.

The Cobalt Resident Geologist Office is closed as a result of reorganization. Assessment files were relocated to 10 Government Road East in Kirkland Lake. A seasonal office, operating between May and October, will be housed in the Cobalt municipal offices. The Kirkland Lake Regional Resident Geologist's office, the Cobalt assessment files, the Mining Lands Consultant and the Kirkland Lake Northern Development office are scheduled to relocate to one office at 10 Government Road East in Kirkland Lake. The Kirkland Lake and Cobalt assessment files will be kept separate.

M.N.D.M. staff assisted the Northern Prospectors Association in presenting an introductory prospecting course offered through the Kirkland Lake campus of Northern College of Applied Arts and Technology. During the Kirkland Lake Home & Trade Show, staff assisted the Northern Prospectors Association with an Ontario Mining Week display. The office contributed to the Resident Geologist Program, Northeast Region display at the PDAC in Toronto in March.

Other staff activities included serving on inter-ministerial committees. G. Meyer is one of the Resident Geologist Program representatives on the Ministry's PDAC committee and as an Ex Officio Member of the Northern Prospectors Association Executive. D. Guindon is active on the MDI2 Steering Committee. C. Messier provides French Language Services for the office as well as the Mining Lands Consultant's office. Prior to redeployment, F.M. Boucher continued to serve as Co-chair, Health and Safety, on the Ministry Employee Relations Committee.

The Kirkland Lake Regional Resident Geologist's office continued to be very active. Please refer to Table 8 for a summary of the 1997 activities.

Property Examinations

BOYCE & BANISTER GOLD SHOWING, POWELL TOWNSHIP

The Boyce and Banister showing is located 10 km northwest of Matachewan close to the northern boundary of Powell Township, 1.6 km east of the West Montreal River at UTM 17 520277E 5317900N on mining claim L1 214 039. The property consists of 8 adjoining claims (95 units). Gerhard Meyer visited the property on September 19, 1997.

The showing was recently stripped. Old casings left in the ground attest to past diamond drilling at the site. Several parallel quartz veins, striking at 042° and dipping 63° to the southeast, are spaced several meters apart. These quartz veins are displaced up to 1.2 m by two parallel, sinistral faults, trending 322° and dipping approximately 82° east. In addition, several parallel, K-feldspar-rich veins, up to 1 cm wide, strike 323° and dip 86° west. The most prominent quartz vein, ranging in width from 2 cm to 20 cm, is exposed for a strike length of 18 m. The host rock to the veins is a mafic volcanic flow containing up to about 6% finely disseminated pyrite.

Mr. Erle Boyce blasted a 12-m long trench oriented north - south subsequent to the visit. Continuous chip samples were taken at 50 cm intervals and the best value obtained is 0.032 ounce Au per ton. Several of the samples, taken in the mafic volcanic rock with disseminated pyrite, returned anomalous gold values of 0.002 ounce Au per ton. Samples of quartz vein material assayed up to 0.16 ounce Au per ton.

A splay of the Galer Lake Branch of the Larder Lake-Cadillac Break (Jensen, 1996) is interpreted to occur 300m south of the showing, striking in a WNW direction.

An EM-16 anomaly (E-1) has been traced for a distance of 3600 feet (Pudifin, 1967) and has a near-linear trend also in a WNW direction. At the west side, under the showing, the anomaly is weak. A number of diamond drill holes were drilled some 30 years ago to test the showing (Assessment File KL-0184). Sulphide mineralization, reported in drill logs, was sampled but assay results were not released. The strongest section of this conductor is to the east between lines 8W and 34W, where it coincides with a swampy area. It is recommended that an IP survey should be conducted on at least one line across the strong EM-16 response to determine if the anomaly is due to bedrock. A diamond-drill hole is recommended if an IP bedrock response is found coincident with the EM-16 anomaly. It should be noted that the location of the Larder Lake-Cadillac Break is interpreted, and rather than being to the south of the EM-16 anomaly, could instead coincide with it. There are also several other EM-16 anomalies that require further follow-up work.

L. GONDOR & G. ATKINS GOLD OCCURRENCE

L. Gondor and G. Atkins hold a group of 44 claims (57 units) in northwest Bryce Township and the adjoining townships of Robillard, Truax and Tudhope (NTS: 41P09/NE, 41P16/SE; UTM: 17 566500E; 5288500N; MDI: NEW). With the help of OPAP grants and options, the claim holders have extensively explored this property since 1989. Previous work done includes prospecting, mapping, airborne and ground geophysics and some stripping.

The property is located 45 km southwest of Kirkland Lake. An all-weather gravel road, leading west from the Hill Lake Fish Hatchery, reaches the southern portion of the claim group. During the fall of 1997, a portion of the claim group was subjected to logging activities, which conveniently provided access to the area where the most significant results have been found to date.

Northeast striking massive and pillowed mafic metavolcanic rocks of the Catharine Group underly the area. Round Lake batholith trondhjemite is exposed on the western part of the claim group. Gold

mineralization in the area is associated with a northeast trending structures (070°), the most significant being the Palmer-Vaughan-Estival Break. A major lineament, north of and parallel to this break, crosses the claim group. An IP survey, done for the claim holders in 1995, shows anomalies trending parallel and sub-parallel to this lineament. Assays up to 0.4 ounce Au per ton were reported on the Mearow-McCombe property, which lies on this lineament on the western edge of the Gondor – Atkins property. The Mearow Lake Fault, which trends northeast (025°) appears to offset this lineament about 100 m to the south.

Power stripping in the area of the IP anomalies was done using the logger's heavy equipment already on site. This allowed a more cost efficient use of the OPAP funds available. One of the areas stripped, along the lineament west of the Mearow Lake Fault, exposed a 2 m wide carbonatized and silicified shear zone containing minor pyrite within massive mafic rocks. Grab samples from this area contain visible gold and return assays up to 2130.7 ppm (62 oz./t) gold. Several other exposures of rusty shears were uncovered lying within the trace of the IP anomalies.

Further work, including washing, mapping and sampling the stripped areas, will be completed when the snow melts in the spring of 1998.

ROY COBALT-SILVER-PAST PRODUCER

D. Chartré and R. Dufresne hold 2 sixteen-hectare claims in south central Farr Tp. (NTS: 41P16/SW). The claim group is located on part of the former Roy Silver Mines Ltd. property (UTM: 17 540182E 5291737N, MDI: T 0382) (formerly Tiara Mines Ltd. and Tormont Mines Ltd.), which produced a small amount of cobalt, silver and copper in 1952-54 and 1964-66.

The claims are located 10 km northwest of Elk Lake. They can be reached by a logging road which leads west from Hwy 65 to Hubert Lake and then south for a total distance of 8 km.

A Nipissing gabbro sill underlies the property. Cobalt Group Gowganda formation conglomerate is exposed to the west and Round Lake Batholith granitic rocks occur to the east of the sill. Several narrow, north trending calcite veins, containing silver-cobalt-copper mineralization, are found on the property.

Past development on the property includes 3 shafts, which were sunk around 1912. There is no record of production until Roy Silver Mines Ltd. leased the property and operated the mine between 1952 and 1954. During this period, work included deepening the main shaft to 390 feet, 1200 feet of underground development, 1178 feet of underground diamond drilling and 3737 feet of surface diamond drilling. In 1954, 2472 tons of treated ore produced a carload of cobalt-copper concentrate averaging 7% cobalt and 6% copper. The property produced 1084 ounces of silver in 1964 and a further 804 ounces of silver in 1966.

In 1996, D. Chartré and R. Dufresne staked part the property. With the aid of an OPAP grant, an exploration program was carried out between August and October, 1997, to re-evaluate the silver, cobalt and copper occurrences. The work included stripping, trenching and sampling, as well as linecutting and a magnetometer survey.

Fifteen areas were stripped and power washed, along a strike length of 900 m. The main vein area, at the mine site, was exposed for a length of 90 m. The vein, which is variable in width up to 30 cm., contains disseminated cobalt arsenides and chalcopyrite. Fifty-five samples taken along this vein averaged 0.7 oz. Ag/t, 1.64% Co, 3.22% Cu and 0.16% Ni. Best values obtained were 4.7 oz. Ag/t, 7.4% Co, 14.02% Cu and 0.55% Ni.

Several narrow calcite veins, containing chalcopyrite and magnetite, run parallel to, and east of, the main vein. Copper values up to 8.46 % were returned from these veins. The high copper sample also returned an anomalous gold value of 390 ppb. The magnetometer survey identified two anoma-

lous north trending zones, attributed to local increases in magnetite in the gabbro sill, which may help to identify the extent of these magnetite bearing calcite veins.

The veins on this property occur in cylindrical joints in the Nipissing gabbro similar to those found in the Gowganda area and described by Eakins (1961) and Hester (1967). Further exploration to locate more veins in this area should be done using the Gowganda area deposits as a guide.

FALLDUCKS LAKE OCCURRENCE

The Fallducks Lake gold-molybdenum occurrence has recently been investigated for its potential as a source of quartz for decorative stone. A large quartz vein is exposed within the Watabeag Batholith in southeast Terry Township. The vein is located approximately 33 km west of Kirkland Lake at UTM Zone 17 541170E 5337440N and can be easily accessed by bush roads off the Watbeag Lake Road.

The vein was discovered in 1908 by William Biederman. A 20-foot pit was sunk on a portion of the vein that carried minor amounts of pyrite, hematite, chalcopyrite and molybdenite. In 1914, 4 diamond drill holes were completed and resulting assays ranged from 0.04 ounce Au per ton to 0.68 ounce Au per ton (Wright 1922, Lovell 1971). The property lay dormant until 1982 when Terry Gold Explorations Inc. completed geological mapping, geophysical surveys and diamond drilling in the vicinity of the vein. The best drill assay was 0.018 ounce Au per ton over 10 feet. Overburden stripping in 1987 and 1988 exposed the vein over about a 200 m length.

The vein is located within pink hornblende-biotite granite of the Watabeag Batholith and strikes about 125º and dips 65º to the west. It is approximately 10 m wide, ranging between 5 and 15 m, and is exposed over a length of about 200 m, as 2 outcrops separated by an overburden covered area. It appears that there is a small offset of the vein occurring between the 2 stripped areas. The pit is at the north end of the outcrop and is developed on a narrow iron oxide stained area in the quartz and contains pyrite and minor molybdenite. Unstained quartz is bright white and opaque with 1-5% pale pink feldspar inclusions, oxidized sulphide inclusions and mafic xenoliths. At the north end of the outcrop, a metre wide lamprophyre dike is injected at the contact of the granite and the quartz vein, over a length of 10 m.

A report by J. McAuley (1996) identified the occurrence as a potential source of quartz for the decorative stone industry. The open ground was staked for Kafka Granite Décor, of Stratford Wisconsin, in July 1997. Dave Guindon was present as approximately 100 kg of quartz was collected from a number of sites on the outcrop for testing. In November 1997, a 600-ton bulk sample was collected under the Aggregate Resources Act for further testing. A 160-ton sub-sample was sent to Wisconsin for processing. During the collection of the bulk sample, a 1.5 m wide zone, within the quartz, was discovered that assayed between 2 and 3% Mo (G. Kafka, personal communication, 1998).

GLIMMER GOLD MINE

The Glimmer Mine, operated by Exall Resources Limited, is located 8km east of Matheson in Hislop Township. The mine (portal) is located at UTM 17 548674E 5375790N. The underground mine workings were visited by Gerhard Meyer and Dave Guindon on November 24, 1997.

Gold zones at the Glimmer Mine are found within, and at the borders of, an intense hydrothermally altered ultramafic rock unit(s) up to 100 m wide and 500 m long within the Destor Porcupine Fault Zone. The auriferous zones and altered ultramafic rocks trend 120° and dip between 20 to 55° southwest. Mineralization is found along the entire length of the zone but the best concentrations occur towards the extremities. The central section is not sufficiently drill-tested and the observed gold distribution may change with additional work. Individual mineralized structures are several hundred meters long with mineable blocks up to 100 m in length and widths varying between 1 to 15 m.

Close-spaced exploration diamond drilling is confined to the first 200 m below surface. One diamond drill hole, beyond a vertical depth of 200 m, intersected 13.8 g/t Au over 8.3 m at the contact of

the alteration envelope. Mineable reserves on March 31, 1997, as reported by Roscoe Postle Associates Inc., were 698 000 t grading 12.8 g/t Au.

Throughout the deposit, ore is found in or at the contacts of “green carbonate” or “grey carbonate”, (hydrothermally altered ultramafic rocks) hosted in surrounding mafic volcanic rocks or unaltered ultramafic rocks. “Green carbonate” predominates on the western side, while “grey carbonate” is most common in the east. Remnant fragments in the “green carbonate” suggest a tuffaceous origin. The green and grey carbonate alteration zones are intensely silicified and carbonatized. Both zones contain hydrothermal quartz/ankerite veins, breccia fillings and stockwork. Ore grade gold values generally occur within zones of quartz/ankerite veining where the quartz/ankerite constitutes more than 20% of the rock. Quartz/ankerite veins are associated with shear zones found frequently within the alteration envelope. Cyclic movement of the Destor-Porcupine Fault and the associated shear zones may have opened up the brittle silicified units, which were then receptive permeable hosts for the gold-bearing hydrothermal pulses.

Hydrothermally altered, porphyritic, felsic intrusions are common and are often discontinuous and patchy. Ankerite occurs within the intense alteration envelope and 100 m beyond before the carbonate changes to calcite (Personal Communication with M. Hasan, G. Trimble, and M. Hoxha – 1997).

For more information see section on Exall Resources Limited and Glimmer Resources Inc. in this report.

Recommendation for Exploration

The recent discovery of massive sulfide mineralization by Cross Lake Minerals Ltd. in Sheraton Township, 25 km soutwest of Matheson, prompted a staking rush covering most available volcanic rocks in the area. The discovery is within the Timmins Regional Resident Geologist's district, however, the eastern strike extension of the volcanic rocks hosting the discovery is in the Kirkland Lake Resident Geologist's district. According to the most recent mapping in the area (Pyke, 1976), the discovery is located on the south side and at the stratigraphical top of a mafic tuff and lapilli–tuff unit within unsubdivided mafic metavolcanic rocks. An east–plunging synclinal fold axis has been interpreted, based on pillow top determinations, to occur approximately in the middle of Sheraton Township. The tuff unit wraps around the nose of the fold at the southeastern part of Night Hawk Lake. The pyroclastic unit, interlayered with unsubdivided mafic volcanic rocks, has been interpreted to continue east to the southeastern quadrant of Sheraton Township. Tracing the continuity of the pyroclasic rocks farther to the east is complicated by several large felsic intrusions. The mafic pyroclastic unit of the northern limb has been traced eastwards as far as the Sheraton – Egan township boundary, where it is cut off by a NNW trending sinistral fault. Three kilometres to the north, on the eastern side of this fault, an intermediate to felsic tuff and lapilli–tuff unit occurs. This unit continues to the east for more than 30km to Cook Township (Timmins–Kirkland Lake Geological Compilation Series, Map 2205). The discontinuity of the felsic and mafic pyroclastic units on opposite sides of the NNW trending fault suggests that it is the same rock unit. If so, a stratigraphical horizon, "favorable" to massive volcanogenic massive sulfide deposits, can be explored for a strike length of 45 km along the northern limb. The "favorable" horizon of the southern limb has a minimum strike length of 15 km and may continue farther to the east and possibly south in disjointed, irregularly shaped remnant blocks of volcanic rocks wrapped around and /or displaced by felsic intrusions.

A volcanic rock hosted base metal occurrence is located in Robertson Township, approximately 18 km south of the Cross Lake discovery. Considering the distribution and configuration of the volcanic rocks and the intrusions, it is conceivable that the two occurrences may be at the same stratigraphical horizon. If this is the situation, then the length of the "favorable" base metal horizon would increase substantially.

Some of the townships near the Cross Lake discovery have been subjected to only limited exploration. Airborne geophysical survey coverage is required for some townships as well as detailed geological mapping. As part of mapping projects, rock geochemistry would aid in localizing hydrothermal alteration zones potentially associated with massive sulfide deposits.

OGS Activities and Research by Others

ONTARIO GEOLOGICAL SURVEY ACTIVITIES

J.A. Ayers and N.F. Trowell continued with the multi-year compilation of the Abitibi greenstone belt. This year, they started work in the Kirkland Lake area. As part of the Abitibi compilation project, Z. Madon, N.F. Trowell and J.A. Ayer used radarsat data for geoscientific applications.

B.R. Berger continued a multi-year project to improve the geological database along the Highway 101 corridor. The emphasis was on the Harker-Holloway area, within the area bounded by Rand, Thackeray, Dokis and Stoughton townships.

G.W Johns continued a project to re-interpret the geology of the Shining Tree area. This summers' emphasis was on the Tyrrell Township area.

S.M. Hamilton continued with high-density regional lake-sediment and lake-water surveys, sampling lakes within a 34-township area between Matachewan and Shining Tree.

S.M. Hamilton, M.B. McClenaghan, A.F. Bajc and G.E.M. Hall continued geochemical studies for the detection of deeply buried mineralization using peat and ground water as sampling media. Work continued on the Shoot Zone in Taylor Township and the Victoria Creek deposit in Gauthier Township.

GEOLOGICAL SURVEY OF CANADA

C.T. Barrie continued the Kidd-Munro extension project.

UNIVERSITY OF OTTAWA

B. Luinstra and K. Benn began a structural investigation of the Holloway Mine and vicinity.

J.C. Ropchan and A.D. Fowler began a lithogeochemical study to characterize the gold-associated alteration between Garrison and Marriott townships.

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Table 1. Summary of claims recorded and assessment work credits filed in the Larder Lake Mining Division - 1997.

Year	Claims Units Recorded	Claim Units Cancelled	Claims Units Active	Diamond Drilling ($)	Physical Work ($)	Geotechnical Work ($)	Total ($)
1997	9599	6858	37 083	N/A	N/A	N/A	N/A
1996	11007	6976	34 342	6 301 498	482 193	2 104 082	8 946 773
1995	8399	6153	31 492	3 347 947	477 415	2 230 599	6 078 375
1994	7006	5872	28 113	1 899 772	64 189	1 321 713	4 112 512
1993	6077	4626	26 979	2 291 228	844 515	1 988 618	5 236 181

** All of the diamond drilling included in Physical Surveys*

Table 2. Mine production and reserves in the Kirkland Lake Regional Resident Geologist's District - 1997.

Mine	Production in 1996		Production in 1997		Reserves at end of 1997	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Armistice[1]	N/A	N/A	5379 tons @ 0.15 oz Au/ton	455 oz	4 228 650	0.198 oz/ton Au
Cheminis Mine	3 000 tons @ 0.12 oz Au/ton	365.8 oz Au	N/A	N/A	N/A	N/A
Extender Minerals		12 000 tons barite		15 000 tons barite	2 years	
Glimmer Mine[1]			214 000 tons @ 0.188 ounce Au/ ton	40 334 oz Au	698 000 tonnes	12.8 g/tonne Au
Hedman Mine		1 920 tonnes hedmanite		3500 tons hedmanite	9 million tonnes	
Holloway Mine	237 284 tons@ 0.157 oz Au/ton	37 149 oz A	399 588 ton @ 0.161 ounce Au/ton	62 800 oz Au	5 317 000 tonnes	0.195 oz/ton Au
Holt-McDermott Mine	483 661 tons @ 0.243 oz Au/ton	117 621 oz Au	461 478 tons @ 0.253 oz Au/ton	116 474 oz Au	4.6 million tons	0.195 oz/ton Au
Kerr Mine	200 000 tons @ 0.06 oz Au/ton	12 000 oz Au[1]	N/A	N/A	N/A	N/A
Lake Shore Crown Pillar Project	N/A	N/A	18 818 tons @ 0.42 oz Au/ton	7 928 oz Au	N/A	N/A
Lake Shore Tailings Project	323 139 tons @ 0.045 oz Au/ton	14 702 oz Au	261 863 tons @ 0.0723 oz Au/ton	11 207 oz Au	N/A	N/A
Macassa Mine	172 018 tons @ 0.387 oz Au/ton	66 504 oz Au	101 842 tonnes? @ 0.386 ounce Au/ton	37 885 oz Au	409 676 tons	0.54 oz/ton Au
Newfield Property[1]	22 240 tons @ 0.202 oz Au/ton	4 500 oz Au	32 760 tons @ 0.158 oz Au/ton	5180 oz Au	N/A	N/A

[1] Bulk sample production

Table 3a. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Abbreviations

AEM	Airborne electromagnetic survey	Lc	Linecutting
AM	Airborne magnetic survey	OvD	Overburden drill hole(s)
BM	Beep mat survey	PEM	Pulse electromagnetic survey
BS	Bulk sampling	PGM	Platinum group metals
DD	Diamond drilling	Pr	Prospecting
DDH	Diamond drill hole(s)	PW	Physical work
DGP	Down-hole geophysics	RE	Re-evaluation of surveys
EBS	Environmental Baseline Study	R	Resistivity survey
Gc	Geochemical survey	rTr	Trenching
GL	Geological survey	SA	Sampling (other than bulk)
GM	Ground magnetic survey	STr	Stripping
Gv	Gravity survey	VLEM	Vertical loop electromagnetic survey
HLEM	Horizontal loop electromagnetic survey	VLF-EM	Very low frequency electromagnetic survey
IP	Induced polarization survey		

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Alma	Cunningham, L.J.	1996, 1997	sTr		KL-4051, KL-4171
Alma, Cairo, Catharine, McElroy	Ploeger, F. "Catharine Gold Group"	1995	SA, sTr, rTr, M, VLF-EM, GL		KL-4102
Alma, Cairo, Powell	Tchajkov, I.	1992	sTr, rTr, SA, GL		KL-4098
Alma, Holmes	Aquisition Ventures Corp.	1997	Lc, IP	2.17549	KL-4231
Alma, Holmes, Flavelle	Bice Ventures Corp. "Chartre-Dufresne Project"	1997	IP, Lc, M, HLEM	2.17515	KL-4228
Argyle	Gagne, Y., Forbes, J., Boyce, E. & McCombe, B. "Thompson Property"	1997	M, VLF-EM	2.17162	KL-4053
Argyle	Kiernicki, F. "TOMFOX Property"	1997	rTr, SA	2.17737	KL-4235
Argyle, Baden, Bannockburn, Powell	Cameco Corporation "Powell Project"	1996	M, GL, Pr, SA, sTr, IP	2.17055	KL-4047
Argyle, McNeil, Robertson	Kalahari Resources Inc./Anglaumaque "Meech Lake Prospect"	1997	IP, HLEM, VLF-EM, M	2.17394	KL-4154
Arnold	Merrick, A.	1995, 1996	DD(1)(792'), VLF-EM, M, GL	2.16860	KL-3990, KL-3977
Arnold	Prince Gold Corporation	1995	DDH(3)(616m), SA		KL-4150
Arnold, Gauthier, Lebel	Sudbury Contact Mines Ltd. "The Victoria Creek Project"	1995	DDH(19)(5883m)		KL-4149
Baden	Boyce, E.	1996	sTr, rTr	2.17144	KL-4126
Baden	Gagne, Y. & Forbes, J. "King West Property"	1997	M, VLF-EM	2.17255	KL-4140
Baden	Kiernicki, F.	1997	PW	2.17645	KL-4229
Baden	Welsh, E. and Kiernicki, F. "Welsh-Kiernicki"	1996	PW		KL-4000

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Bannockburn	Kiernicki, F.	1995	M, VLF-EM, rTr, Lc		KL-4101
Bannockburn, Montrose	Outokumpu Mines Ltd. "Bannockburn Property"	1997	Lc, M, HLEM	2.17615	KL-4195
Bannockburn, Montrose	RJK Explorations Inc.	1996	DD(4)(1138.0m), SA, IP	2.17048	KL-4070
Barnet	Glimmer Resources Inc. "Glimmer Property"	1997	DD(9)(1181m)	2.176410	KL-4165
Barnet, Thackeray	Detector Resources Ltd. "Abitibi-Phoenix Property"	1996	DD(7)(1005m), M, VLF-EM, SA, Lc	2.17230	KL-4157
Beatty	Anglaumaque Explorations Inc. "Clodan Prospect"	1997	M, HLEM, IP	2.17178	KL-4090
Beatty	Anglaumaque Explorations Inc. "Hewit prospect"	1997	M, IP, HLEM	2.17186	KL-4084
Beatty	Anglaumaque Explorations Inc. "Highway Prospect"	1996	M, VLF-EM, IP	2.17153	KL-4086
Beatty	Kalahari Resources Inc. "Denovo Property"	1996	DD(3)(1058'), SA	2.17030	KL-4018
Beatty	NAR Resources Ltd.	1996	DD(3)(1806'), SA		KL-4205
Beatty	Pentland Firth Ventures Ltd.	1997	DD(1)(152m), SA	2.17739	KL-4217
Beatty	Totem Mining Corp. "Highway Property"	1996	DD(6)(2006'), SA	2.17032	KL-4017
Beatty, Coulson, Warden	Exploration Maude Lake "Matheson North-East Group"	1997	DD(3)(621m)	2.17299	KL-4120
Benoit	Carmichael, M. & Whalen, R.	1995	DD(5)(827m), SA		KL-3973
Benoit	Jasperson, J.K. "Jasperson Benoit TP Gold Prospect"	1995	SA, DD(2)(545')		KL-4100
Benoit	Rodholm, C.	1997	sTr, PW, SA	2.17562	KL-4207
Bernhardt	Kiazyk, J.	1995	VLF-EM	2.17006	KL-4031
Bernhardt	O'Bradovich, T. & Harkin, G. "Kimberley Prospect"	1996	VLF-EM, M	2.16917	KL-3969
Bernhardt	O'Connor, F.T. "Goodfish Lake Property"	1995, 1996	sTr, GL, SA, Lc, IP, VLF-EM	2.17632	KL-4107, KL4233
Bernhardt	St. Jean, P.	1994, 1997	rTr, SA	2.17322	KL-3992, KL-4135
Bernhardt, Teck	Marion, E. & Carreau, A. "Lakeview Property"	1995, 1996	rTr, sTr, SA	2.17326	KL-4095
Berry, Sulphur Island	1083291 Ontario Limited "WOW Property"	1996, 1997	DD(1)(92'), SA, Pr	2.17112, 2.17113	KL-4052, KL-4066
Boston	Pancham Mining Group Ltd.	1997	rTr, Pr, SA	2.17339	KL-4194
Boston	Panterra Minerals Inc. "Bulldog Prospect"	1996	IP, M, VLF-EM	2.16916	KL-4038
Boston, McElroy	Carmichael, S. "CW-Boston Creek Gold Property"	1996	DD(3)(1003.8'), SA	2.17512	KL-4188
Boston, Otto	Marshall, Boston Iron Mines	1972	DD(21) (6,353')		KL-4138
Bowman, Currie	Falconbridge Limited "Currie-Bowman Option"	1996, 1997	IP, HLEM, DD(6)(1447.2m), PEM	2.16944, 2.17127, 2.17126, 2.17128	KL-4064, KL4065, KL-3996, KL-4068
Cairo	Kosy, G.D. & Crowley Groundwater Limited "Browning Lake Area"	1996	sTr, SA		KL-4026

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Cairo	Kosy, G.D. & Crowley Groundwater Limited "Webb Lake Area"	1996	sTr, SA		KL-4022
Cairo	Norcan Resources Ltd. "Whiskey Jack Creek Project"	1997	IP, M	2.17301	KL-4144
Cairo	Panterra Minerals Inc. "Matachewan Prospect"	1996	VLF-EM	2.16914	KL-4005
Cairo, Flavelle, Holmes	Inmet Mining Corporation "West-Kirkland property"	1996	sTr, SA, GL, RE, IP, M	2.17462, 2.17463, 2.16809	KL-4091, KL-4092, KL-4161
Cairo, Kimberly, Powell, Yarrow	Royal Oak Mines Inc. "Matachewan Consolidated Option"	1996	DD(29)(14549'), SA	2.17158	KL-4204
Cairo, Powell, Yarrow	Norcan Resources Ltd.	1997	AM, AEM	2.17354	KL-4185
Carr	Pentland Firth Ventures Ltd. "Carr Township Project"	1997	DD(6)(1848m)	2.17369	KL-4117
Catharine	Annett, R. & Wigglesworth, F.	1996	sTr	2.17100	KL-4067
Catharine	Dyment, L.M. & Kidston, J.A.	1997	M, VLF-EM, Lc	2.17117	KL-4129
Catharine	Hill, R. "Catharine Gold Property"	1996, 1997	sTr, GL, Lc	2.17634	KL-4001, KL-4209
Catharine	Kidston, J.A. "Catharine Project"	1996	IP	2.17468	KL-4178
Catharine	Perron, A.H. "Misema-8 Group"	1997	M, VLF-EM	2.17267, 2.17706	KL-4074, KL-4226
Catharine	Perron, A.J. "Indian Six"	1997	Lc, M, VLF-EM	2.17397	KL-4202
Catharine	Ploeger, F. "Catharine Gold Group"	1996	rTr	2.17300	KL-4139
Catharine, Skead	Ryan Lake Metals Ltd. "Benson Lake Property"	1996	OvD(10)(224.2m)	2.17054	KL-4055
Catharine, Skead	Ryan Lake Metals Ltd. "Catharine and Skead Township Gold Property"	1995	DD(24)(15 860'), SA, sTr		KL-4011
Chamberlain	Lashbrook, R.	1996	SA, DD(1)(200')		KL-4096
Cleaver	Flinksy, W.		sTr, rTr, SA		KL-4063
Clifford	Link, T.	1996	DD(4)(2465')		KL-4013
Clifford	Regal Goldfields Limited "C-14 Kimberlite Pipe"	1993	BS	2.16943	KL-4056
Cook	Wilzel Resources Ltd "Cook Property"	1997	Lc, IP	2.17342	KL-4190
Coulson	Campsall, L.	1997	DD(2)(111.60), rTr	2.17706	KL-4206
Coulson, Knox, Rickard, Teefy, Wilkie	Abitibi Paper Co./Geomont Exploration	1974	M, IP, VLEM, DD(3)		KL-4172
Currie	Crites, D. Salo, L.	1996	DD(2)(789')		KL-4049
Currie	Cross Lake Minerals Ltd. "Currie 1-96 Grid"	1996	TEM,IP	2.16907	KL-3967
Currie	Golden Knight Resources Inc. "Currie Project"	1997	Lc, M, IP	2.17539	KL-4187
Doon	WMC International Limited "Doon Property"	1995, 1996	GL, SA, GC, M, IP, OvD(1)(41.3m)	2.17268	KL-4125, KL-4132

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Dunmore, Robertson, Sheba	Camphor Ventures Inc.	1997	AEM, VLF-EM, M	2.17558	KL-4192
Eby	Allsopp, A. "Allsopp Property"	1995	Lc, GL, M, IP, SA, sTr		KL-4110
Eby	Robinson, D.	1995	Lc, sTr, M, HLEM, GL		KL-4112
Eby	Robinson, D. "Eby-West & Otto properties"	1996	Lc, GL, M, HLEM, SA		KL-4130
Edwards	Cross Lake Minerals "Edwards-17 Property"	1997	M, HLEM	2.17251	KL-4078
Edwards	Cross Lake Minerals Ltd.	1996	DD(5)(1442.74m), SA	2.17376	KL-4124
Edwards	Cross Lake Minerals Ltd. & Cathedral Gold Corp.	1996	M, HLEM	2.17082	KL-4023
Elliott	CDK Syndicate "Harker Extension"	1997	VLF-EM	2.17031	KL-4040
Elliott	Gwen Resources "Ghost 50 Property"	1996	VLF-EM,	2.16858	KL-3983
Elliott	Perron, A.J. "50 Ghost Grid"	1996	Lc, M	2.17127	KL-4164
Elliott	The Perron Gold Corporation "Elliott South-73"	1996	GL, M, VLF-EM	2.16920, 2.16912	KL-4030, KL-4041
Elliott, Thackeray	559505 Ont. Ltd. "Thackeray-60 Group"	1996	GL	2.16863	KL-3984
Elliott, Thackeray	559505 Ont. Ltd. "Tie-On Group"	1996	M	2.16882	KL-3985
Flavelle	Chartre, D. & Dufresne, R. "The McChesney Property"	1995	SA, M, sTr, rTr		KL-4104
Flavelle	Dufresne, R. & Chartre, D.	1995	sTr, SA, Pr, M	2.16727	KL-4006
Flavelle, Holmes, Alma	Dufresne, R. & Chartre, D. "The Brookbank and Jean's Pond Properties"	1996	Pr, SA	2.17665	KL-4232
Frecheville	Beland, D. & Beland, L.	1996	PR, M, VLF-EM, HLEM, sTr, SA	2.17053	KL-4008
Frecheville, Holloway	Robitaille, R.	1996	VLF-EM, M	2.16902	KL-3981
Galna	WMC International Limited "The Dokis River Project"	1995	Lc, M, PEM		KL-4159
Garrison	Hobbs, L.G. "Garrison Four Property"	1995	DD(2)(932'), SA		KL-4015, KL4103
Garrison	Moneta Porcupine Mines Inc. "Garrison Township Project"	1996	DD(1)(222m), SA, IP	2.17219, 2.17630	KL-4076, KL-4197
Garrison	Patrician Gold Mines LTD "Winteroad Mineral Corp. Property"	1995	DD(13)	2.17280	KL-4088
Garrison	Totem Sciences Inc. "Munro Fault Zone Prospect"	1997	IP, VLF-EM, M	2.17033	KL-4019
Garrison, Harker	Abitibi Mining Corp. "New Year's Eve Gold Property"	1996, 1997	DD(3)(703m), SA, IP	2.17081, 2.17375	KL-4060, KL-4169
Garrison, Harker	Hemlo Gold Mines Inc.	1995	DD(6)(2125.6 m), SA		KL-3994

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Garrison, Thackeray	Perron, A.H. "Silverside-64"	1997	M, VLF-EM	2.17643	KL-4222
Gauthier	Beaverhouse Resources/ Queenston Mining Inc. "Beaverhouse Lake Upper Beaver Project (508)"	1995	DD(10)(12833'), SA, IP, DGP	2.17432	KL-4113, KL-4145
Gauthier	MacGregor, R.A.	1996	M	2.16873, 2.16805, 2.17387	KL-3989, KL-4004, KL-4167
Gauthier	Queenston Mining	1997	DD(1)(265.7')	2.17710	KL-4223
Gauthier	Skead Holdings Ltd.	1997	M	2.17281	KL-4079
Gauthier	Sudbury Contact Mines Ltd. "Commodore Moose Crossing Property"	1996	OvD, SA	2.17566	KL-4193
Gauthier	Sudbury Contact Mines Ltd.	1997	M	2.17319	KL-4080
Gauthier, Hearst, McElroy, McVittie	Skead Holdings Ltd. – Sudbury Contact Mines L	1995	DD(2)(492.5 m), SA		KL-4043
Gauthier, Hearst, McElroy, McVittie	Sudbury Contact Mines Ltd. "Diamond Lake Project"	1992	GL, M		KL-3975
Gauthier, McElroy	Hill, R.V. "Moose Crossing Group"	1996	sTr, SA		KL-4045
Grenfell	Doetzel, D.	1996	DD(7)(1019'), SA	2.17093	KL-4128
Grenfell	Kinross Gold Corporation "Barry McCombe Grenfell - West Group"	1995, 1996, 1997	Pr, GL, SA, sTr	2.17367, 2.17325, 2.17298, 2.17713	KL-4137, KL-4177, KL-4182, KL-4213
Grenfell	Kinross Gold Corporation "Barry McCombe Grenfell-East Group"	1996, 1997	sTr, Pr	2.17297, 2.17310	KL-4180, KL-4181
Grenfell	Sedex Mining Corp. "Sirola Prospect"	1974	DD(7)(953.0m), SA, GL		KL-4072
Grenfell	Vallier, B. "Kapakita Creek Property"	1995	SA, DD(1)(996'), Gc		KL-3979, KL-4099
Guibord	Anglaumaque Explorations Inc. "Tax prospect"	1997	M, HLEM, IP	2.17167	KL-4085
Guibord	Brothers Gold Corporation	1996	GL	2.16908	KL-3968
Guibord	Goldhunter Explorations Inc.	1997	M, IP	2.17288	KL-4143
Guibord	Homestake Canada Inc. "Fenn-Gib"	1996	DD(2)(369.70m), SA	2.17477	KL-4174
Guibord	Jonpol Explorations Ltd. "Guibord Gold Prospect"	1997	M, IP, DD(6)(2203')	2.17270	KL-4082
Guibord	NAR Resources Ltd. "Highway 101 Project"	1996	IP	2.16691	KL-4160
Guibord	O'bradovich, T. "Guibord Township Project"	1996	IP	2.17285	KL-4184
Guibord	O'Bradovich, T., Mullan, G., & Jomi Minerals "Otis J. Exploration Ltd."	1996	M	2.16884	KL-3971
Guibord	Pangea Goldfields Inc. "Fenn-Gib Property"	1995	DD(7)(1606m), SA		KL-4148
Guibord, Michaud	Homestake Canada Inc. "Perry Lake Property"	1996	GL, DD(2)(340m), SA	2.17137, 2.17151	KL-4054, KL-4069

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Guibord, Playfair	Dyment, L.M., Kidston, J.A., Carmichael, S. "CDK-Playf-air, Guibord Gold Properties"	1996	IP, M	2.17049	KL-4025
Harker	Barrick Gold Corporation "Holt McDermott Project"	1996	IP	2.17403	KL-4152
Harker	Barrick Gold Corporation "SIMS Block"	1996	IP	2.17282	KL-4075
Harker	Pentland Firth Ventures Ltd. "Harker West Property"	1996	DD(1)(302 m)		KL-4044
Harker, Holloway	Battle Mountain Gold	1996	DD(10)(10137.6m), SA	2.17704	KL-4227
Hincks	Kiernicki, F.	1997	rTr	2.17736	KL-4216
Hincks	Kiernicki, F. "Larder Lake Break Project"	1997	DD(1)(193.3m)	2.17735	KL-4234
Hislop	Canadian Arrow Mines Ltd. "Canadian Arrow Property"	1996	DD(1)(150.05m), SA	2.17629	KL-4198
Hislop	Hemlo Gold Mines Inc./ Cameco Corp. "Pike River Property"	1995	DD(9)(2323m)		KL-4147
Holloway	Battle Mountain Canada Ltd. "Golden Highway"	1995	DD(11)(6815.2m), SA		KL-3993
Holloway	Dyment, L.M. & Queenston Mining Inc.	1996	M	2.17024	KL-4035
Holloway	Greater Lenora Resources Corp. "Holloway Project"	1996	DD(1)(197m), SA		KL-4029
Holloway	Greater Lenora Resources Corp.-INCO J.V. "South Block"	1996	DD(3)(447 m)		KL-4028
Holloway	Greater Lenora Resources Group "Inco Option Project"	1996	IP	2.16877	KL-3986
Holloway	Obradovich, T.	1996	VLF-EM	2.16941	KL-4046
Holloway	Perron, A.J. "The Holloway Thirty Claim Block"	1997	M, VLF-EM	2.17185	KL-4114
Holloway	Robitaille, R. & Gervais, L. "Gervais-Robitaille Property"	1996	M, VLF-EM	2.16940	KL-4032
Holloway, Marriott	The Perron Gold Corporation "101 Property"	1997	Lc, M, VLF-EM	2.17295	KL-4093
Holmes	Cunningham, L.J. "Cunningham Property"	1996	sTr		KL-4062
Holmes	Lourim, J. "Half-Moon Lake Property"	1995	SA		KL-4109
Holmes	Teck Exploration Ltd. "Abel Lake Option Project"	1997	sTr, SA, M, VLF-EM, Lc, GL	2.17409, 2.17669, 2.17674	KL-4158, KL-4218, KL-4225
Katrine	Gagne, Y.	1996	rTr, SA		KL-4027
Katrine, McVittie	Sudbury Contact Mines Ltd.	1997	M	2.17202	KL-4134
Kimberley	Windsor, K.	1996	SA, Pr, sTr	2.17364	KL-4142
Kimberly	Jeanette Lourim & Associates "Heart Lake-Kimberly South"	1996	Lc, M, GL	2.17628	KL-4208

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Lamplugh	Campbell, R.& Hendriksen, G. "Knarley Property"	1995	M, VLF-EM, GL, SA, Pr	2.17050	KL-4009, KL-4105
Lebel	Dyment, L.M., Kidston, J.A.	1996	M, VLF-EM	2.17022	KL-4039
Lebel, Gauthier	Sudbury Contact Mines Ltd. "Commodore Property"	1996	Lc, M, VLF-EM, IP	2.17476	KL-4162
Maisonville	O'Bradovich, T. "Otis J. Exploration Ltd."	1995	IP, R	2.16821	KL-3966
Maisonville	O'Connor, T	1996	M, VLF-EM	2.17565	KL-4189
Marriott, Stoughton	Battle Mountain Canada Ltd.	1996	DD(3)(1226.5m), SA	2.17734	KL-4215
Marriott, Stoughton	Hemlo Gold Mines Inc. "Stoughton Project"	1996	IP	2.17345	KL-4121
McCool	Anglaumaque Explorations Inc. "Clover Prospect"	1997	M, VLF-EM	2.17154	KL-4087
McCool	Belore Mines Ltd./Placer Development Ltd. "Belore Option"	1980			KL-4173
McGarry	Brownstone Investments Inc.	1996	M, VLF-EM, IP, R	2.16957	KL-4037
McGarry	Brownstone Investments Inc. "Spadetto Option"	1996	DD(1)(135.6 m), SA		KL-4003
McGarry	Homestake Canada Inc. "McGarry-Dasserat Project"	1996	IP, M, Lc	2.17232, 2.17293	KL-4127
McGarry	MacGregor, R.A./Armistice Mine "2050 Level/200W Sheldon Larder"	1995	DD(4)(909')		KL-4083, KL-3988
McGarry	Transpacific Resources Inc. "Copper, Gold & Diamond Property"	1995	str, SA, IP, M, VLF-EM, DD(7)(488.m)		KL-4151
McGarry	Transpacific Resources Inc. "McGarry Township Project"	1997	DD(1)(110m)	2.17286	KL-4119
McNeil	Canadian Zeolite Ltd. "1996 Oliver Group/Can. Zeolite Joint Venture"	1996	DD(3)(1200'), Lc, IP	2.17240	KL-4175
McVittie	Sudbury Contact Mines Ltd.	1996	M,VLF-EM	2.16906	KL-3976
McVittie	Sudbury Contact Mines Ltd. "Lac McVittie Property"	1997	SA, GL	2.17400	KL-4163
Melba	Raven Resources Inc.	1996	M, VLF-EM, IP	2.17052	KL-4042
Michaud	Battle Mountain Gold Corp. "Perry Lake Project"	1996	M, IP, GL	2.16879	KL-3970
Michaud	Homestake Canada Inc. "Perry Lake Property"	1997	DD(4)(1143m), SA	2.17451	KL-4153
Michaud	Moneta Porcupine Mines "Michaud Township Property"	1997	Lc, IP	2.17363, 2.17552	KL-4136, KL-4196
Michaud	Pacific Minesearch Ltd. "Michaud Property"	1997	IP	2.17553	KL-4200
Michaud	Pentland Firth Ventures Inc. "Michaud Project"	1996	DD(1)(218m)	2.17306	KL-4122
Michaud	Pentland Firth Ventures Ltd.	1996	DD(3)(624m)		KL-4050

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Midlothian	Dyment, M., Kidston, J., Obradovich, T., Filo, J. and Jones, D.	1996	sTr		KL-3995
Midlothian	Orezone Resources Inc. "Laroma Showing"	1996	Pr, SA	2.17200	KL-4058
Midlothian	Pyke, D.R. and Mullen, D.V. "Midlothian Township Property"	1996	GL, SA	2.17296	KL-4077
Midlothian, Montrose	Jones, D.	1995	DD(1)(697'), SA		KL-3991
Montrose	Orezone Resources Inc. "Montrose Property"	1997	Lc, PEM, HELM, M	2.17188	KL-4089
Morrisette	Link, T.A.	1996	DD(3)(1618'), SA		KL-4021
Morrisette	Medici Resources Limited	1996	DD(1)(806'), SA		KL-4014
Morrisette	Medici Resources Limited	1996	DDH(7)(7889'), SA	2.17039	KL-4016
Morrisette	Merrick, A.	1996	DD(1)(1256')		KL-4007
Morrisette	O'Connor, F. "Morrisette Township Property"	1995	sTr, GL, SA	2.17646	KL-4108, KL-4212
Mulligan	Bouzane, D "Bouzane claims"	1997	sTr, SA	2.17634	KL-4210
Mulligan, Rattray, Skead	Sudbury Contact Mines Ltd. "Wendigo "A" & "B" Property"	1992	GL, Gc, SA		KL-3974
Munro	Millstream Mines Ltd.	1996	DD(9)(5139')	2.17437	KL-4201
Munro	Perron, A.J. "The Munro Group"	1997	Lc, M, VLF-EM	2.17109	KL-4116
Munro	Trinity Explorations "Munro Prospect"	1996	HLEM, IP, R	2.16913	KL-3987
Munro, Guibord, McCool, Michaud	Barrick Gold Corporation "Pipestone Project"	1996	IP, R	2.17008	KL-4012
Noseworthy	Battle Mountain Canada Ltd. & Highwood Ltd. "Mikwam Joint Venture"	1997	DD (11)(3670.4m)	2.17187	KL-4141
Ossian	Labbe, P. "The Barnard Lake Property"	1995	IP, M		KL-4111
Ossian	Silver Century Exploration Ltd.	1996	M,VLF-EM, IP, R	2.16992	KL-4034
Ossian	Silver Century Exploration Ltd. "Labbe/Boudreault Option"	1996	M, VLF-EM, IP, R	2.16991	KL-4033
Ossian	Silver Century Explorations Limited "Ossian Project"	1996	OvD(29)(599.1m), SA	2.17170	KL-4071
Ossian	Umiljendic, M.	1996	M, VLF-EM	2.17147	KL-4061
Otto	Robinson, D. and Robinson, B. "Eby-West & Otto Township properties"	1996	GL, M, LC, HLEM, SA	2.17119	KL-4133
Pacaud	Perron, A. "Barry Hollinger Four Claims"	1996	PW		KL-3982
Playfair	Teddy Bear Valley Mines Ltd. "Wild Goose Project"	1996	Lc, IP	2.17669	KL-4219
Pontiac	Scodnick, J. "Clarice Lake Project"	1992	SA, GL		KL-4097

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Powell	Abitibi Mining Corp. "Campbell Project"	1997	M	2.17510	KL-4183
Powell	Campbell, D.	1996	sTr		KL-4024
Powell	Driver Resources Ltd. "Powell-3-28 Property"	1997	VLF-EM, M	2.17291	KL-4073
Powell	Freewest Resources Canada Inc. "Powell Project"	1995	M, VLF-EM, IP	2.17284	KL-4170
Powell	Kiernicki, F. & McKay, B.J. "Hauley Lake Project"	1997	DD(3)(1104'), SA	2.17324	KL-4156
Powell	Peters, R. "Hawley Lake Property"	1996	rTr, PW	2.17201	KL-4094
Powell	Royal Oak Mines "Matachewan Project"	1997	IP, Lc	2.17292	KL-4115
Powell	Royal Oak Mines Inc. "Otisse Lake Property"	1997	M	2.17199	KL-4057
Powell	Sedex Mining Corp. "Oka 4 Property"	1997	VLF-EM	2.17373	KL-4199
Powell	Sedex Mining Corp. "Oka Project"	1997	M	2.17481	KL-4176
Powell	Sedex Mining Corporation "Welsh Stanwick Project"	1996	IP	2.17203	KL-4131
Powell	Stanwick, S.	1996	sTr		KL-4002
Powell, Cairo	Royal Oak Mines Inc. "Matachewan Project"	1996	EBS	2.16948	KL-3998
Rand	Hawley, P. "Hawk Property"	1995	VLF-EM, M, SA, GL		KL-4106
Rand	Henriksen, G.N. "Hawk Property"	1995	PR, M, VLF-EM, GL, SA	2.17051	KL-4010
Rickard	RJK Explorations "CDKW-Rickard Property"	1996	DD(3)(643.3m), GL, Lc, M, IP	2.17283	KL-4224
Sangster	Noranda Explorations "Raven Project"	1995	GL	2.17772	KL-4221
Sharpe	Grabowski, R.	1996	sTr		KL-3999
Sheba	Dunn, G.C.	1996	Pr, Gc, SA, M, HLEM	2.16841, 2.17005, 2.17294	KL-3978, KL-4036, KL-4155
Sheba	Dunn, G.C. "Sheba Township Property"	1997	PEM	2.17547	KL-4203
Sherring	Cross Lake Minerals Ltd. "Cross Lake Property"	1996	M, HLEM	2.17129	KL-4059
Stimson	Anvil Resources Ltd. "Fox1 and Fox2 Property"	1995	DD(12)(2730m)	2.17834	KL-4230
Stoughton	Nufort Resources Inc. "Border Group Gold Property"	1995, 1996	IP, DD(6)(2346'), SA	2.16874	KL-3972, KL-3980
Tannahill	Sedex Mining Corporation "Tannahill Project"	1996	IP	2.17344	KL-4123
Taylor, Walker	Moneta Porcupine Mines Inc. "Walker & Taylor properties"	1997	Lc, IP	2.17370	KL-4118
Teck	Cyprus Canada Inc. "Amalgamated Kirkland Project"	1995	DD(6)(2519m), SA		KL-4146

Table 3a. cont'd. Assessment files received in the Kirkland Lake Regional Resident Geologist's District (Kirkland Lake area) in 1997.

Township or Area	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Teck	Kinross Gold Corporation "Kirkland Lake Operation"	1997	DDH(2)(3123')	2.17738, 2.17850	KL-4214, KL-4236
Teck	Moore, H.A.	1997	M, VLF-EM	2.17089	KL-4020
Teck	Obradovich, T.	1996	DD(1)(600'), SA	2.17374	KL-4168
Teck	Perron, A. "Perron Lake 1996"	1996	M, VLF-EM	2.16919	KL-3997
Thackeray	Perron, A. "Hour Glass Lake Grid"	1997	Lc, M, VLF-EM	2.17633	KL-4211
Thackeray	Perron, A.H. "Vinkle Lake Grid"	1997	Lc, M, VLF-EM	2.17567	KL-4191
Thackeray	Perron, A.H. "C-144 Group Boundary Grid"	1997	Lc, M, VLF-EM	2.17663	KL-4220
Thackeray	Perron, A.H. "C-Group"	1997	Lc, M, VLF-EM	2.17537	KL-4186
Wilkie	Fournier, E.	1996	rTr, SA		KL-4048
Yarrow	Barnes, R.	1997	rTr	2.17484	KL-4179
Yarrow	Extender Minerals of Canada Ltd.	1997	rTr	2.17405	KL-4166
Yarrow	Opawica Explorations Inc. "Matarrow Property"	1996	DD(6)(1077.6 m)	2.17169	KL-4081

Table 3b. Assessment files received in the Regional Resident Geologist's District (Cobalt area) in 1997.

Township	Company Name "Property Name"	Year	Type of Work	AFRO Number
AMYOT, BROWNING, OGILVIE, SHEARD	FALCONBRIDGE LTD.	APR/97	DD	2.17193
ASQUITH	SKEAD HOLDINGS LTD.	NOV/96	M	2.16909
ASQUITH, CHURCHILL	HAWLEY, P.J.	OCT/95	Lc, Pr, VLF-EM, M, GL, SA	OP95-168
BARR	SILVER CENTURY EXPLORATION LTD.	DEC/95	DD	W9780.00007
BARR, FIRSTBROOK	SILVER CENTURY EXPLORATION LTD.	AUG/95	M, Gv	2.16883
BARR, FIRSTBROOK	SILVER CENTURY EXPLORATION LTD.	SEP/95	PEM	2.17025
BEAUCHAMP	DUNN, G.C.	AUG/97	M, SA	2.17664
BEST	BARGOLD RESOURCES LTD.	FEB/97	GL, M, HLEM	2.17684
BEST	BARGOLD RESOURCES LTD.	OCT/96	PEM	2.17685
BEST	CHITARONI, G.	FEB/95	DD	2.17332
BEST	CHITARONI, G.	JUN/97	Lc, Pr, GL	2.17333
BEST	KING, D.	OCT/96	Lc, Pr, BM	2.16922
BEST, BRIGSTOCKE	NORCAN RESOURCES LTD.	MAY/97	AM, AEM	2.17683
BROWNING	TINDALE, J.L.	OCT/96	DD	W9680.00520
BRYCE	DIAMOND ROCK RESOURCES INC.	OCT/96	DD	2.17321
BRYCE	DIAMOND ROCK RESOURCES INC.	AUG/96	GL, M	2.17368

Table 3b. cont'd. Assessment files received in the Regional Resident Geologist's District (Cobalt area) in 1997.

Township	Company Name "Property Name"	Year	Type of Work	AFRO Number
BRYCE	DIAMOND ROCK RESOURCES INC.	OCT/96	DD	2.17415
BRYCE	DUNN, G.C.	AUG/95	Pr, SA, DD	OP95-024
BRYCE	EWANCHUK, J.R.	SEP/97	GL	2.17440
BRYCE	GEREGHTY, G.J.	JAN/96	DD	OP95-144
BRYCE	GEREGHTY, G.J./ MORRIS, J./ PUSKAS, M.S.	JAN/97	M, VLF-EM	2.17198
BRYCE	GONDOR, L.	OCT/96	Pr, DD, GL	2.17098
BRYCE	KORBA, E.J.	MAR/97	M, VLF-EM	2.17148
BRYCE, TUDHOPE	EWANCHUK, J.R.	NOV/95	Pr, GL, Tr, DD, SA	OP95-127
BUCKE	FALCONBRIDGE LTD.	JUN/97	Pr, Gc, VLF-EM	2.17427
BUCKE	SUDBURY CONTACT MINES LTD.	MAY/96	GL	2.17040
BUCKE	SUDBURY CONTACT MINES LTD.	MAR/96	Lc, M, VLF-EM	2.17116
BUCKE	SUDBURY CONTACT MINES LTD.	MAR/96	OvD	2.17136
CABOT, CONNAUGHT	WMC INTERNATIONAL LIMITED	FEB/97	GL, Gc, M	2.17094
CASSELLS, STRATHY	CURION VENTURES INC.	MAY/97	M, HLEM	2.17543
CASSELLS, STRATHY	WABANA EXPLORATIONS INC.	DEC/96	AM, AEM	2.17134
CASSELLS, STRATHY	WABANA EXPLORATIONS INC.	MAR/97	IP	2.17657
CHURCHILL	SKEAD HOLDINGS LTD.	OCT/96	M	2.16871
CONNAUGHT	PANTERRA MINERALS INC. / KALAHARI RESOURCES LTD.	APR/97	M, VLF-EM	2.17505
ELDRIDGE, SOUTH LORRAIN	GODDARD, D.L.	OCT/95	Pr, BM, sTr, Tr, SA	OP95-164
ELDRIDGE, SOUTH LORRAIN	GODDARD, D.L.	OCT/96	Pr, SA, M, VLF-EM	2.17092
FAWCETT	ANNETT, R.	JUN/97	Pr, GL, SA	2.17478
FAWCETT	FORT KNOX GOLD RESOURCES INC.	FEB/95	DD	W.9780.00573
GILLIES LIMIT	DUNN, G.C.	OCT/96	GL, SA	2.16842
GILLIES LIMIT	WATTS, H.A.	JAN/97	Pr, sTr, Tr	2.17102
HARRIS	CROWLEY GROUNDWATER LTD.	MAR/97	OvD	2.17149
HUDSON	SUDBURY CONTACT MINES LTD.	JUL/96	GL	2.17041
HUDSON	SUDBURY CONTACT MINES LTD.	OCT/96	Lc, M, VLF-EM	2.17115
HUDSON	SUDBURY CONTACT MINES LTD.	MAR/96	OvD	2.17179
HUDSON	SUDBURY CONTACT MINES LTD.	MAR/97	M	2.17482
HUDSON	WALTON, H.G.	APR/97	M	2.17740

Table 3b. cont'd. Assessment files received in the Regional Resident Geologist's District (Cobalt area) in 1997.

Township	Company Name "Property Name"	Year	Type of Work	AFRO Number
HUDSON	WINDSOR, K.	APR/97	Pr, SA, M	2.17253
HUDSON, LUNDY	SUDBURY CONTACT MINES LTD.	MAR/96	OvD	2.17180
JAMES	DIPLACIDO, C.	OCT/96	Lc, VLF-EM	2.16381
JAMES	PINKERTON, G.	SEP/96	sTr, SA	W9680.00519
KELVIN, KEMP	HANYCH, W.	JAN/97	Lc, HLEM	2.17101
KELVIN, KEMP	HANYCH, W.	MAY/97	SA, GL	2.17111
KELVIN, KEMP, MOND, RAYMOND	HANYCH, W.	NOV/95	Pr, SA	OP95-273
KNIGHT, TYRRELL	HADDINGTON RESOURCES LTD.	DEC/95	DD	OM95-095
LAWSON	LACARTE, A.	DEC/96	Tr, sTr	2.17164
LEONARD	ANNETT, R.	NOV/96	DD, Lc, GL, M, VLF-EM	2.17234
LEONARD	LACARTE, A.	MAR/97	sTr, Tr	2.17152
LEONARD	LACARTE, A.	MAR/97	sTr, Tr	2.17488
LEONARD	LACARTE, A.	MAY/97	sTr, Tr	2.17631
LEONARD	PILGER, G. / PILGER, S.	AUG/96	Tr	W9680.00611
LUNDY	POLLOCK, J.W.	JAN/97	Pr, SA, AM, AEM	2.17269
LUNDY	SUDBURY CONTACT MINES LTD.	MAR/95	OvD	W9680.00598
LUNDY	SUDBURY CONTACT MINES LTD.	APR/95	Lc, M, VLF-EM	2.17034
LUNDY	SUDBURY CONTACT MINES LTD.	JUL/96	GL	2.17038
LUNDY	SUDBURY CONTACT MINES LTD.	MAR/97	M	2.17483
LUNDY	SUDBURY CONTACT MINES LTD.	MAR/97	M	2.17511
LUNDY	WALTON, H.G.	JAN/97	Pr, Tr, AM	2.17254
MACMURCHY	PARRES, J.	NOV/95	Lc, VLF-EM, M, GL	OP95-360
MACMURCHY	SALO, J.	NOV/95	DD	OP95-352
MACMURCHY	WHELAN, R.C.	NOV/96	Pr, SA, sTr, Tr	2.17023
MACMURCHY, FAWCETT	EROS FINANCIAL INVESTMENTS	MAR/97	Lc, VLF-EM, M, GL, SA	2.17197
MOND	PANTERRA MINERALS INC.	DEC/96	IP	2.17502
NATAL	WEBSTER, B.	MAY/95	IP	OP94-540
NORTH WILLIAMS	FALCONBRIDGE LTD.	AUG/96	DD	W9680.00592
NORTH WILLIAMS	FALCONBRIDGE LTD.	JUL/96	Lc, M, IP	2.16915
NORTH WILLIAMS	LACARTE, A.	JULY/96	sTr, Tr	2.17183
NORTH WILLIAMS	TINDALE, J.L.	NOV/96	GL, M, VLF-EM	2.16942
NORTH WILLIAMS	TINDALE, J.L.	SEP/97	M, VLF-EM, GL	2.17703
OGILVIE	LACARTE, A.	NOV/96	sTr, Tr	2.17165
RANKIN	KRETSCHMAR, U. / McMAHON, J.	SEP/97	Lc, Pr, GL, M	2.17287

Table 3b. cont'd. Assessment files received in the Regional Resident Geologist's District (Cobalt area) in 1997.

Township	Company Name "Property Name"	Year	Type of Work	AFRO Number
RANKIN	PHELPS DODGE CORP. OF CANADA LTD.	JUN/96	GL	2.17124
SOUTH LORRAIN	GORE, J.A.	JAN/96	Lc, GL, M, SA	OP95-039
SOUTH LORRAIN	MOORE, H.A.	NOV/95	Lc, Gc, M, VLF-EM	OP95-130
SOUTH LORRAIN	MOORE, H.A.	NOV 96	Lc, M, VLF-EM	2.17091
SOUTH LORRAIN	MOORE, H.A.	AUG/96	GL, SA	2.17160
SOUTH LORRAIN	PANTERRA MINERALS INC.	NOV/96	AM	2.17138
SOUTH LORRAIN	RAVEN RESOURCES INC.	NOV/96	Lc, GL, BM	2.16886
STRATHY	ABITIBI MINING CORP. / SEDEX MINING CORP.	APR/97	M, HLEM, PEM	2.17542
STRATHY	BLAKE, F.	AUG/95	Lc, sTr, Tr, GL, VLF-EM, M	OP95-355
STRATHY	BLAKE, F.	AUG/95	M, VLF-EM, GL	2.17047
STRATHY	DIAMOND ROCK RESOURCES INC.	AUG/96	GL	2.17571
STRATHY	FALCONBRIDGE LTD.	NOV/94	DD	W9670.00174
STRATHY	FALCONBRIDGE LTD.	MAR/96	Lc, PEM	2.16921
STRATHY	GUPPY, C.	OCT/96	Tr	W9680.00201
STRATHY	KING, D.	JUN/97	Pr, SA, BM	2.17575
STRATHY	LARONDE, D.	DEC/96	VLF-EM	2.17279
TYRRELL	CLARK, H.A (9407824 ALBERTA LTD.)	NOV/96	Lc, M	2.16888
TYRRELL	GOLDEYE EXPLORATIONS LTD.	MAR/97	IP, M	2.17004
TYRRELL	HADDINGTON RESOURCES LTD.	MAR/95	DD, SA	W9680.00640
TYRRELL	HADDINGTON RESOURCES LTD.	JUL/96	DD	2.17439
TYRRELL	HADDINGTON RESOURCES LTD./ PORTMAN EXPLORATIONS LTD.	AUG/95	Lc, Pr, Tr, GL, DD, IP, M	OM95-016
TYRRELL	HADDINGTON RESOURCES LTD./ PORTMAN EXPLORATIONS LTD.	JUL/95	Tr	W9680.00641
TYRRELL	HADDINGTON RESOURCES LTD./ PORTMAN EXPLORATIONS LTD.	NOV/95	GL, Pr, Gc, Tr	2.16885
TYRRELL	ROYAL OAK MINES INC.	SEP/96	sTr	W9680.00459
TYRRELL	STRIKE MINERALS INC.	AUG/96	Lc, M, VLF-EM	2.16998

Table 4. Exploration activity in the Kirkland Lake Regional Resident Geologist's District - 1997.

Abbreviations

AEM	Airborne electromagnetic survey	Met	Metallurgical testing
AM	Airborne magnetic survey	OvD	Overburden drilling
ARA	Airborne radiometric survey	ODH	Overburden drill hole(s)
Beep	Beep Mat survey	OMIP	Ontario Mineral Incentive Program
BS	Bulk sampling	OPAP	Ontario Prospectors Assistance Program
DD	Diamond drilling	PEM	Pulse electromagnetic survey
DDH	Diamond drill hole(s)	Pr	Prospecting
DGP	Down-hole geophysics	R	Resistivity survey
Gc	Geochemical survey	SA	Sampling (other than bulk)
GL	Geological Survey	Seismic	Seismic survey
GP	Ground Geophysics unspecified type	SP	Self-potential survey
Gv	Gravity survey	sTr	Stripping
HLEM	Horizontal loop electromagnetic survey	rTr	Trenching
IP	Induced polarization survey	UG	Underground exploration/development
Lc	Linecutting	VLEM	Vertical loop electromagnetic survey
M	Ground magnetic survey	VLF-EM	Very low frequency electromagnetic survey

No.	Company/Individual (Occurrence Name) or Property	Township/Area	Exploration Activity*
1-107	See tables 3a & 3b		
108	Fekete, M.	Abbotsford	sTr, SA, GP, Pr, Lc, OPAP
109	Ferderber, R.	Abbotsford	sTr, SA, GP, Pr, Lc, OPAP
110	Cunningham, L.	Alma	GL, Lc, sTr, SA, OPAP
111	Merrick, A.	Arnold	sTr, SA, DD, OPAP
112	Dunn, Gary	Beauchamp	GP, Gc, OPAP
113	Healy, D.	Ben Nevis	Pr, GL, Gc, GP, SA, OPAP
114	Obradovich, T.	Ben Nevis	Pr, GL, Gc, GP, SA, OPAP
115	O'Connor, F.T.	Bernhardt	DD, SA, OPAP
116	Chitaroni, G.	Best	Pr, SA, Gc, OPAP
117	Horne, J	Boston	Lc, GL, sTr, SA, GP, OPAP
118	Gondor, L.	Bryce	Pr, SA, sTr, OPAP
119	Ploeger, J.	Catharine	GL, Gc, SA, sTr, OPAP
120	Laronde, D.	Chambers	Lc, GP, GL, Gc, SA, OPAP
121	Keast, T.	Clifford	Pr, GL, Gc, GP, SA, OPAP
122	Link, T	Clifford	DD, SA, OPAP
123	Porritt, D.	Clifford	Pr, GL, Gc, GP, SA, OPAP
124	Stoliker, L.	Clifford	Pr, GL, Gc, GP, SA, OPAP
125	Agnico Eagle Mine Limited and Falconbridge Limited	Coleman	AEM
126	Watts, H.	Coleman	Pr, GP, SA, OPAP
127	Sterling Pacific Resources Inc.	Coulson, Knox, Warden	Lc, GP, Pr, GL,SA
128	Carreau, A.	Dokis	sTr, SA, GP, OPAP

Table 4. cont'd. Exploration activity in the Kirkland Lake Regional Resident Geologist's District - 1997.

No.	Company/Individual (Occurrence Name) or Property	Township/Area	Exploration Activity*
129	Marion, E.	Dokis	sTr, SA, GP, OPAP
130	Dyment, M.L.	Egan	Pr, GP, SA, OPAP
131	Haddington Resources Ltd. and Silverstone Resources Ltd.	Egan	DD, SA
132	Goddard, D.	Eldridge	sTr, SA, Gc, OPAP
133	Chartré, D.	Farr	GL, SA, GP, sTr, OPAP
134	Dufresne, R.	Farr	GL, SA, GP, sTr, OPAP
135	Beland, D.	Frecheville	DD, sTr, SA, OPAP
136	Beland, L.	Frecheville	DD, sTr, SA, OPAP
137	Sudbury Contact Mines Limited	Gauthier	UG
138	Wabana Explorations Inc.	Gillies Limit	AEM, Lc, GP
139	Prevec, L.	Grenfell	GL, Gc, GP, DD, sTr, OPAP
140	Tandem Resources Ltd.	Guibord	DD, SA
141	Bouzane, D.	Harker, Lamplugh	Pr, sTr, GP, DD, OPAP
142	Bilenki, P.	Haultain	Pr, GP, SA, OPAP
143	Brigadier Gold Limited	Hearst	STr, SA, rTr
144	Sudbury Contact Mines Limited	Hearst, McElroy	DD, SA
145	Kiernicki, F.	Hincks	DD, SA, GL, OPAP
146	Inca Mining Corp. and Houston Lake Mining Inc.	Hislop	Lc, GL, GP, SA, sTr, rTr, DD
147	St. Andrew Goldfields Ltd.	Hislop	DD, SA, UG
148	Anderson, S.	Kelvin	Pr, SA, GP, OPAP
149	Lourim, J.	Kimberley	Pr, GL, SA, Gc, OPAP
150	Mill City Gold Mining Corp. and Tyranex Gold Inc.	Knight, Tyrrell	DD, SA
151	Pelangio-Larder Mines Ltd and Battle Mountain Gold Company	Knight, Tyrrell	SA, Lc, GP, Gc, DD
152	Ferderber, H.	Lamplugh	Pr, GL, GP, SA, OPAP
153	Hawley, P.	Lamplugh	Pr, SA, GL, GP, OPAP
154	Kidston, J.A.	Lebel	Pr, GP, GL, DD, OPAP
155	Mullan, G.	Maisonville	Pr, GP, SA, OPAP
156	Armistice Resources Ltd	McGarry	UG, DD, SA
157	Salo, A.	McGarry	DD, SA, OPAP
158	Transpacific Resources Inc.	McGarry	DD, SA
159	Fey, C.	McVittie	Pr, sTr, SA, GP, OPAP
160	NFX Gold Inc.	McVittie	UG, DD, SA
161	Leahy, M.	Melba	GL, GP, DD, SA, OPAP
162	Mullen, V.	Midlothian	GP, Gc, OPAP
163	McCombe, B.	Morrisette	Pr, Lc, GL, SA, GP, OPAP
164	Medici Resources Limited	Morrisette	Lc
165	Sutton, M.	Morrisette	GL, GP, SA, Gc, OPAP
166	Lalonde, D.	Munro	GP, Lc, OPAP
167	Millstream Mines Ltd.	Munro	DD, SA, GP
168	Tindale, J.	North Williams	Pr, SA, GP, GL, OPAP

Table 4. cont'd. Exploration activity in the Kirkland Lake Regional Resident Geologist's District - 1997.

No.	Company/Individual (Occurrence Name) or Property	Township/Area	Exploration Activity*
169	Silver Century Explorations Ltd	Ossian	DD, SA
170	Rivard, F.	Otto	sTr, DD, SA, OPAP
171	NovaWest Resources Inc.	Pense	DD, GP,
172	NovaWest Resources Inc.	Pense	DD, GP, SA
173	Carmichael, S.	Playfair	sTr, Gc, SA, OPAP
174	Royal Oak Mines Inc.	Powell	UG
175	Campbell, R.	Rand	Pr, GL, SA, OPAP
176	Henriksen, G	Rand	Pr, GP, SA, GL, OPAP
177	Gore, J.	South Lorrain	sTr, SA, GP, Pr, OPAP
178	Wareing, S.	South Lorrain	Pr, SA, OPAP
179	Webster, B.	Strathy	DD, SA, OPAP
180	Enouy, D.	Tannahill	Pr, sTr, GP, SA, OPAP
181	Sedex Mining Corporation and Abitibi Mining Corporation	Tannahill	DD, SA
182	Londry, D.	Tyrrell	GP, OPAP

** Exploration activity is listed if known.*

Table 5. Property visits conducted by the Kirkland Lake Regional Resident Geologist's Office - 1997.

Number (keyed to Figure 2)	Property/Occurrence (MDI Number)*
1	Adair Location 3
2	Adair Location 4
3	Bargold
4	Bissonette, M.
5	Boyce & Banister [1]
6	Fallducks Lake [1]
7	Glimmer/Exall [1]
8	Gondor, L. / Atkins G. [1]
9	Grabowski
10	Guppy
11	Kosy-Salo South
12	Peddie's Farm
13	Princeton
14	Robinson
15	Roy [1]
16	Sedex
17	Wabana
18	West Porphyry
19	Wigwam Silver Mines

1 Described in "Property Examinations" section, this report.

Table 6. Publications received by the Kirkland Lake Regional Resident Geologist's Office - 1997.

Title	Author	Type and Year of Publication
Aboriginal participation in the mining industry of Canada, 1996		Intergovernmental Working Group on the Mineral Industry, Sub-committee on Aboriginal Participation in Mining, 1996
High purity calcite and dolomite resources of Ontario	Kelly, R.I.	Ontario Geological Survey, Open File Report 5954, 39p., 1996
Prospectors guide to drift prospecting for diamonds, northern Ontario	Morris, T.F. and Kaszicki, C.A.	Ontario Geological Survey, Miscellaneous Paper 167, 63p.
Report of Activities 1996, Resident Geologists		Ontario Geological Survey, Open File Report 5958, 565p., 1997
Investors Exchange - Corporate profiles		PDAC Convention 1997, 81p., 1997
Exploration & development highlights		PDAC Convention, 1997, 54p., 1997
A regional evaluation of gold potential along the western extenstion of the Larder Lake-Cadillac Break, Matachewan area: results of regional till samp	Bajc, A.F.	Ontario Geological Survey, Open File Report 5957, 50p., 1997
Gold deposits and their geological classification	Robert, F., Poulsen, K.H. and Dube, B.	Exploration '97, Toronto, 23p., 1997
A preliminary geological model for the syenite-associated disseminated gold deposits in the Abitibi belt, Ontario and Quebec	Robert, F.	in Current Research 1997-C, Geological Survey of Canada, p.210-210, 1997
World-class Archean gold deposits in Canada: an overview	Robert, F. and Poulsen, K.H.	Australian Journal of Earth Sciences, v.44, p.329-351, 1997
Komatiite flodding of a rifted Archean rhyolitic arc complex: geochemical signature and tectonic significance of the Stoughton-Roquemaure Group, Abiti	Dostal, J. and Mueller, W.U.	The Journal of Geology, v.105, p.545-563, 1997
Copper-gold alloy minerals from the Kerr Mine, Ontario	Knipe, S.W. and Fleet, M.E.	The Canadian Mineralogist, v.35, p.573-586, 1997
The quiet counter-revolution: structural control of syngenetic deposits	Nelson, J.	Geoscience Canada, v.24, p.91-98, 1997
Composition of spinels in the C14 kiberlite, Kirkland Lake, Ontario	Armstron, K.A., Roeder, P.L. and Helmstaedt, H.H.	Russian Geology and Geophysics, v.38, p.454-466, 1997
Geophysics and geochemistry at the millenium		Proceedings of Exploration '97: Fourth Decennial International Conference on mineral exploration, edited by A.G. Gubins, GEO F/X, 1068p., 1997
Summary of field work and other activities 1997		Ontario Geological Survey, Miscellaneous Paper 168, 147p.
Brigstocke and Kittson townships	Born, P. and Burbidge, G.H.	Ontario Geological Survey, Report 275, 55p.

Table 7. Mineral deposits not being mined in the Kirkland Lake Regional Resident Geologist's District - 1997.

Abbreviations

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

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
180 East (Lebel)	Au 32D04SW00339	360 000 tons of 0.12 oz per ton Au	Queenston Mining Inc. (50%) - Franco-Nevada Mining Corporation Limited (50%) (Press Release April 27, 1996)	CMH 1997-98, p.380	Inactive
Ajax (Strathy)	Cu, Ni, Au, Ag, PGE	2 062 505 tons of 0.412% Cu, 0.257% Ni; veins can average 2.9% Ni, 4.0% Cu, 2 g/t Au, 3.4 g/t Pt	Northern Platinum Ltd. (55%) (CMH 1997-98, p. 342)	CMH 1997-98, p. 342	Inactive
Amalgamated Kirkland (Teck)	Au 42A01SE00151	1 983 000 tons of 0.16 oz per ton Au	Franco-Nevada Mining Corporation Limited (15%) - Queenston Mining Inc. (15%) - Cyprus Canada Inc. (70%) (Press Release Dec.13, 1995)	CMH 1997-98, p.380	Active
Anoki (Gauthier)	Au 32D04SW00069	1 182 000 tons of 0.12 oz per ton Au	Queenston Mining Inc. (50%) - Franco-Nevada Mining Corporation Limited (50%) (Press Release April 27, 1996)	CMH 1997-98, p.380	Active
Argyll (Beatty)	Au 42A09SW00133	730 900 tonnes of 8.06 g/t Au	McWatters Mining Inc. CMH 1997-98 p. 291	CMH 1997-98, p. 291	Active
Armistice (McGarry)	Au 32D04SE00013	4 228 560 tons of 0.198 oz per ton Au	Armistice Resources Ltd. (CMH 1996-97, p.47)	Armistice Res., Press Release, Dec. 11, 1997	Active
Barber Larder (McGarry)	Au 32D04SE00043	60 000 tons of 0.16 oz per ton Au	NFX Gold Inc. (50%) - Gwen Resources Ltd. (50%) (CMH 1997-98, p.334)	CMH 1990-91, p.338	Inactive
Blue Quartz (Beatty)	Au 42A09SW00130	109 000 tons of 0.484 oz per ton Au	Joutel Resources Ltd. (50%) - River Gold Mines Ltd. (50%) (CMH 1996-97, p.245)	NM, March 20, 1980	Inactive
Boston Creek (Pacaud)	Au 31M13NW00053	330 000 tonnes of 4.2 g/T Au	Atapa Minerals Limited (50%) - Teck Corporation (CMH 1996-97, p.50)	CMH 1997-98, p.50	Inactive
Buffonta (Garrison)	Au 32D05NW00009	400 000 tons of 0.15 oz per ton Au	Gwen Resources Ltd. (60%) - AJ Perron Gold Corporation (40%)(CMH 1996-97, p.26)	CMH 1997-98, p.221	Inactive
Clenor (Strathy)	Au, AG	24 000 tons of 0.21 oz per ton Au, 1.8 oz per ton Ag	Gwen Resources Ltd. (CMH 1997-98, p.220)	GR 163	Inactive

Table 7. cont'd. Mineral deposits not being mined in the Kirkland Lake Regional Resident Geologist's District - 1997.

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Creek Zone (Hislop)	Au 42A08NW00142	1 118 000 tons of 0.184 oz per ton Au	Stroud Resources Ltd. (CMH 1996-97, p.401)	CMH 1997-98, p. 434	Inactive
Diadem	Cu, Ni	450 000 tons of 0.5% Cu, 0.1% Ni to 400 feet	Teck Corporation – Cominco Ltd.	MDIR N 0045	Inactive
Eastmaque (Teck)	Au 42A01NE00043	2 132 500 tons of tailings of 0.035 oz per ton Au	Hecla Mining Company (Eastmaque to Equinox Resources Ltd to Hecla in 1994) (CMH 1996-97, p.207-208)	CMH 1991-92, p.142	Inactive
Fenn-Gib (Guibord)	Au 42A09SE00054 42A09SE00187	40 700 000 tonnes of 1.33 g/t Au – Mineable resource of 1 950 000 tonnes of 5.13 g/t Au	Pangea Goldfields Inc. (70% Fenn, 100% Gib)(CMH 1997-98, p.360)	CMH 1997-98, p.360 and Sprott Securities Limited, Research Comment, July 11, 1997	Inactive
Fort Knox	Cu, Ni	750 000 tons	Fort Knox Gold Resources Inc. – Inco Limited (CMH 1997-98, p. 183)	AF	Active
Garrcon (Garrison)	Au 32D12SW00004	350 900 tons of 0.191 oz per ton Au	Moneta Porcupine Mines Inc. (75%) – Jonpol Explorations Limited (25%)(OFR 5735, p.766, CMH 1997-98, p.258)	Jonpol Explorations Limited News Release, February 2, 1988	Active
Golden Harker (Harker)	Au 32D05NW00159	500 000 tons of 0.16 oz per ton Au	Golden Harker Explorations Limited (CMH 1997-98, p.204)	NM, March 7, 1988	Inactive
Gordon Lake	Au	225 000 tons of 0.20 oz per ton Au to 750 feet	Duncan Gold Resources Inc. – Dalhousie Oil Company Ltd. (AF)	AF	Inactive
Hislop Mine (Hislop)	Au 42A08NW00108	334 882 tons of 0.178 oz per ton Au proven & probable, 118 074 tons of 0.155 oz per ton Au possible	St Andrew Goldfields Ltd. (CMH 1997-98, p. 428)	CMH 1997-98, p. 428	Active
Hislop West (Hislop)	Au 42A09SW00033	19 230 tons of 0.59 oz per ton Au	Battle Mountain Gold Company (CMH 1997-98, p.67)	OFR 5735, p.1070	Inactive
Iris (Harker)	Au - W 32D05NW00021	769 756 tons of 0.07 oz per ton Au	The Alberta Gold Corporation (55%) - Perrex Resources Inc. (45%) (CMH 1995-96 p.289)	AF KL-3170	Inactive
Leckie (Leckie)	Au	405 000 tons of 0.2 oz per ton Au	Stroud Resources Ltd. (CMH 1997-98, p. 434)	CMH 1997-98, p. 4	Inactive
Ludgate (Michaud)	Au 42A08NE00159	463 000 tonnes of 5.91 g/t Au	Pentland Firth Ventures Ltd. (60%) - QSR Ltd. (40%) (CMH 1995-96, p.312)	The Ontario Prospector Vol.1 Issue 1, p. 41	Inactive

Table 7. cont'd. Mineral deposits not being mined in the Kirkland Lake Regional Resident Geologist's District - 1997.

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Matachewan (Powell)	Au 41P15NE00014 41P15NE00017	13 253 000 tons of 0.067 oz per ton Au mineable, 1 976 000 tons of 0.139 oz per ton Au additional	Royal Oak Mines Inc. (CMH 1996-97, p.375)	CMH 1996-97, p.375	Inactive
McBean (Gauthier)	Au 32D04SW00060	2 943 900 tons of 0.18 oz per ton Au	Queenston Mining Inc. (50%) - Franco-Nevada Mining Corporation Limited (50%) (Press Release April 27, 1996)	Queenston Mining Inc. 3rd Quarter Report, September 30, 1997	Active
Michaud(MIchaud)	Au C 0445 C 2562 C 2563 C 2564 C 2578 C 2579 C 2580 C 2581	2.4 million tonnes of 6.07 g/t Au	Moneta Porcupine Mines Inc. (Barrick Gold Corp. will earn 60% by spending $3.5 million on exploration) (CMH 1996-97, p. 286)	Mining in Ontario 1997 p.7	Active
Newfield (Garrison)	Au 32D12SW000042	450 000 tons of 0.28 oz per ton Au	Jonpol Explorations Limited (64.3%) - T&H Resources Ltd. (35.7%) - Agreement with Hillsborough Resources Limited to share mining profits (CMH 1996-97, p.243)	CMH 1996-97, p.243 and Jonpol Explorations Limited, Project Progress Report, April 10, 1997	Active
Omega (McVittie)	Au 32D04SE00017	300 000 tons of 0.16 oz per ton Au	Greater Lenora Resources Corp. (CMH 1997-98, p.216)	CMH 1997-98, p.216	Inactive
Ross (Hislop)	Au 42A08NW00005	1 055 000 tons of 0.125 oz per ton Au	Preston Electrical and Mechanical Ltd. (sold by Giant Yellowknife Mines Limited in 1989 CMH 1990-91, p.188)	CMH 1989-90, p.188	Inactive
Taylor (Taylor)	Au 42A10SE00066 42A10SE00065	Taylor – 1 460 000 tons of 0.28 oz per ton Au Shoot – 1 150 000 tons of 0.157 oz per ton Au including proven & probable 530 579 tons of 0.178 oz per ton Au	St Andrew Goldfields Ltd. (CMH 1997-98, p.428)	CMH 1997-98, p.428	Active
Teck Hughes (Teck)	Au 42A01NE00020	375 000 tons of 0.2 oz per ton Au	Kinross Gold Corporation - Newfields Minerals Inc. (PC, 1996)	CMH 1991-92, p.270	Inactive
Temagami Copper	Cu, Ni	770 000 tons of 1.04% Cu, 0.46% Ni	Teck Corp. – Cominco Ltd. (AF)	AF	Inactive
Tyranite (Tyrrell, Knight)	Au	567 000 tons of 0.18 oz per ton Au	Mill City Gold Mining Corp. – Tyranex Gold Inc. (CMH 19987-98, p.310)	NM 06/93	Active
Upper Beaver (Gauthier)	Au 32D04SW00068	300 000 tons of 0.23 oz per ton Au	Royal Oak Mines Inc. (51%) - Queenston Mining Inc. (49%) (Queenston Mining Inc., Kirkland Lake Project, November 1995)	Queenston Mining Inc., Kirkland Lake Project, November 1995	Active

Table 7. cont'd. Mineral deposits not being mined in the Kirkland Lake Regional Resident Geologist's District - 1997.

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Upper Canada	Au 32D04SW00057	2 093 800 tons of 0.20 oz per ton Au	Queenston Mining Inc. (50%) - Franco-Nevada Mining Corporation Limited (50%) (Press Release April 27, 1996)	CMH 997-98, p.380	Inactive
Victoria Creek (Gauthier)	Au NEW	5 520 000 tons of 0.10 oz per ton Au	Sudbury Contact Mines Limited (CMH 199798, p.434)	CMH 1997-98, p.434	Active

Table 8. Summary of Activities of the Kirkland Lake Regional Resident Geologist's Office - 1997.

Activity	Number
Office Visits	2313
Office Visits - Drill Core Library	48
Telephone Inquiries	1916
Property Visits/Separate Sites	19
Field Trips Attended	5
Field Trips Given	0
Talks Given	3
Assessment Files & Donations Processed	340
OPAP/OMIP/Heritage Fund Reports Processed	42
Titles Added to Library Database	36
Drill Holes Added to Drill Core Library	0

Does not include office visits or telephone inquiries to Cobalt Resident Geologist's office.

Table 9. Gold production in the Kirkland Lake Regional Resident Geologist's District – 1997.

Mine	Township	Tons Milled	Production (oz.Au)	Grade (oz./T)	Years of Production
Aljo	Beatty	2333	42	0.018	1940
American Eagle	Munro	60	40	0.667	1911
Argyll	Beatty	25	30	1.200	1918
Armistice*	McGarry	8282	1035	0.125	1995, 97 (bulk sample)
Ashley	Bannockburn	157076	50123	0.319	1932-36
Barber Larder	McGarry	30118	3072	0.102	1988
Barry Hollinger	Pacuad	267741	77000	0.288	1918,25-36,44-46
Bidgood	Lebel	586367	160184	0.273	1934-51
Blue Quartz	Beatty	500	81	0.162	1923,26,28,34
Bourkes	Benoit	1298	277	0.213	1918,36-38
Buffonta	Garrison	117013	12139	0.104	1981,91-92
Canadian Arrow	Hislop	279593	17045	0.061	1980-83
Canamax (Matheson Project)	Holloway	38675	5391	0.139	1988
Cathroy Larder (Mirado)	McElroy	89719	10231	0.114	1941-44,47,57,87
Centre Hill**	Munro	327007	422	0.001	1967-70

Table 9. cont'd. Gold production in the Kirkland Lake Regional Resident Geologist's District – 1997.

Mine	Township	Tons Milled	Production (oz.Au)	Grade (oz./T)	Years of Production
Cheminis	McVittie	179013	17530	0.098	1991-
Chesterville	McGarry	3260439	358880	0.110	1930-52
Croesus	Munro	5333	14859	2.786	1915-18,23,31-36
Eastmaque (tailings)	Teck	1051744	28740	0.027	1988-91
Gateford (Swastika)	Teck	103684	30068	0.290	1910-47***
Glimmer*	Hislop	214000	40334	0.188	1997 (bulk sample)
Golden Summit	Maisonville	737	57	0.077	1936-37,45
Gold Hill	Catharine	4616	660	0.143	1927-28
Gold Pyramid	Guibord	175	36	0.206	1911
Hislop Mine (Hislop East)	Hislop	205125	31270	0.152	1990-91,93-95
Holloway Mine*	Holloway	715167	112611	0.157	1993,95(preproduction),96-
Holt-McDermott*	Holloway	4622948	677922	0.147	1988-
Hudson-Rand	Teck	6496	483	0.074	1922
Kerr	McGarry	40336512	10457441	0.259	1911,38-96
Kirkland Lake	Teck	3140283	1172955	0.374	1916-60
Kirkland Townsite	Teck	4230	1921	0.454	1958-59
Laguerre	McVittie	40514	7568	0.187	1937-39
Lake Shore*	Teck	17136741	8581174	0.501	1918-65,82-87,97
Macassa*	Teck	7701479	3453081	0.448	1933-
Macassa (Tailings)*	Teck	2681236	142149	0.053	1987-
Matachewan Consolidated	Powell	3525200	378101	0.107	1934-54
McBean	Gauthier	557621	45900	0.082	1984-86
Miller Independence	Pacaud	31	59	1.903	1918
Moffat-Hall	Lebel	16388	4780	0.292	1934-35
Morris Kirkland	Lebel	127253	16999	0.134	1936-38,40-42
New Telluride	Skead	104	62	0.596	1931-32
Newfield*	Garrison	55000	9680	0.176	1996(bulk sample)
Omega	McVittie	1615081	214098	0.133	1913,26-28,36-47
Queenston	Gauthier	1054	177	0.168	1941
Ross	Hislop	6714482	995832	0.148	1936-89
Ryan Lake**	Powell	188790	1352	0.007	1948-57,62-64
Stairs	Midlothian	15835	3573	0.226	1965-66
Sylvanite	Teck	5049536	1674808	0.332	1927-61
Teck Hughes	Teck	9565302	3709007	0.388	1917-68
Toburn	Teck	1186316	570659	0.481	1917-68***
Upper Beaver	Gauthier	580562	140709	0.242	1913-72***
Upper Canada	Gauthier	4648984	1398291	0.301	1938-71
White-Guyatt	Munro	50	10	0.200	1911
Wright Hargreaves	Teck	9934327	4821296	0.485	1921-65
Young Davidson	Powell	6213272	585690	0.094	1934-57
Total including tailings		**133311467**	**40037934**	**0.300**	
Total excluding tailings		**129578487**	**39867045**	**0.308**	

EXPLANATION (Figure 1)

Producing Mines, 1997

1. Barrick Resources Corporation
   Holt-McDermott Mine — Au, Ag
2. Battle Mountain Gold and Teddy Bear Valley Mines Limited
   Holloway Mine — Au
3. Extender Minerals of Canada Ltd.
   Yarrow Township Mine — barite
4. Hedman Resources Ltd.
   Hedman Mine — hedmanite (serpentine filler)
5. Kinross Gold Corporation
   Crown Pillar Project — Au, Ag
6. Kinross Gold Corporation
   Lake Shore Tailings Project — Au, Ag
7. Kinross Gold Corporation
   Macassa Mine — Au, Ag

Advanced Exploration Projects

1. Armistice Resources Ltd.
   Armistice Property — Au
2. Exall Resources Limited and Glimmer Resources Inc.
   Glimmer Mine — Au
3. Extender Minerals of Canada Ltd.
   North Williams Township Barite Deposit — barite
4. Hillsborough Resources Limited, Jonpol Explorations Ltd. and T&H Resources Ltd.
   Joint Venture — Au
5. Royal Oak Mines Inc.
   Matachewan Project — Au
6. Sudbury Contact Mines Limited
   Victoria Creek Gold Zone — Au

Producing Quarries

1. Miller Minerals
   Bucke Quarry — limestone
2. Tundra Granite and Marble
   Teck Quarry — marble ("green-carbonate")

Location of O.G.S. Field Party

1. Geological compilation of the Abitibi greenstone belt (J.A. Ayer, and N.F. Trowell)
2. Geological along Highway 101, east of Matheson (B.R. Berger)
3. Reappraisal of the geology of the Shining Tree area (Tyrrell Township) (G.W. Johns)
4. High denisty lake sediment and lake water geochemistry survey of the Shining Tree area (S.M. Hamilton)
5. An evaluation of peat and shallow groundwater for the detection of deeply buried mineralization: case studies from the Shoot Zone and Victoria Creek gold deposits (S.M. Hamilton, M.B. McClenaghan, A.F. Bajc and G.E.M. Hall)

KIRKLAND LAKE REGIONAL RESIDENT GEOLOGIST'S DISTRICT

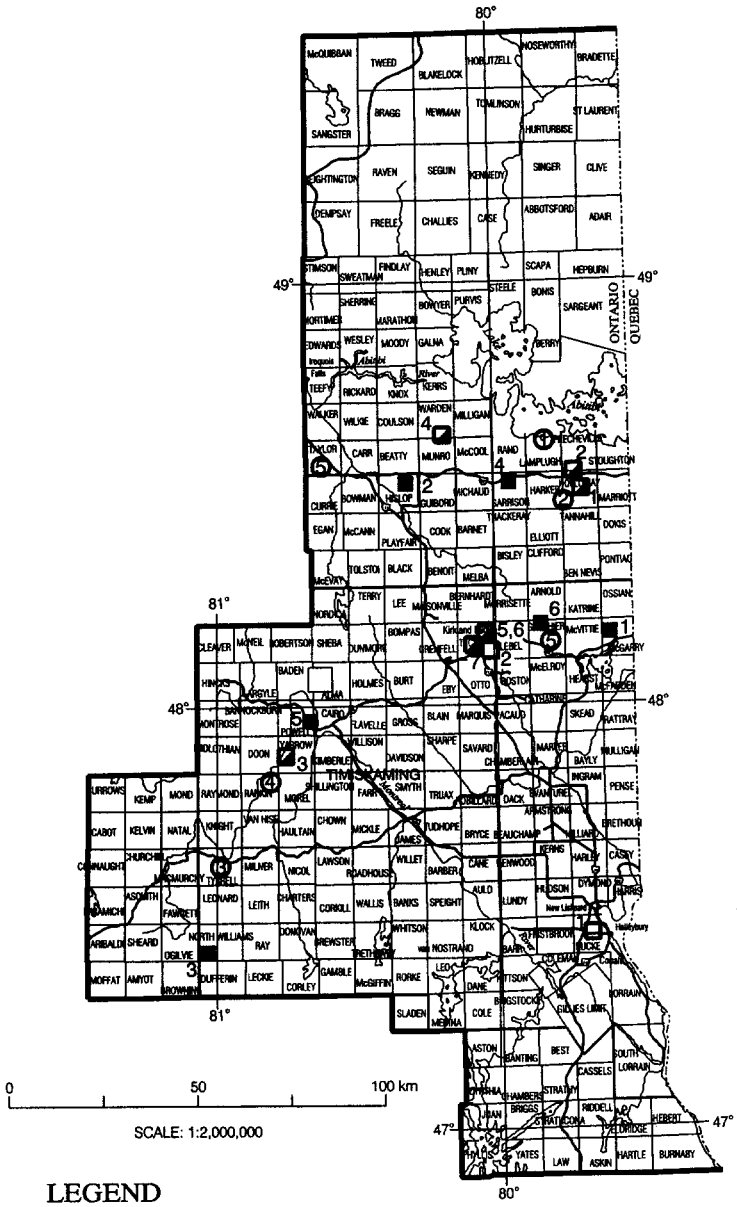

Figure 1. Mining and exploration in the Kirkland Lake Regional Resident Geologist's District – 1997

KIRKLAND LAKE REGIONAL RESIDENT GEOLOGIST'S DISTRICT

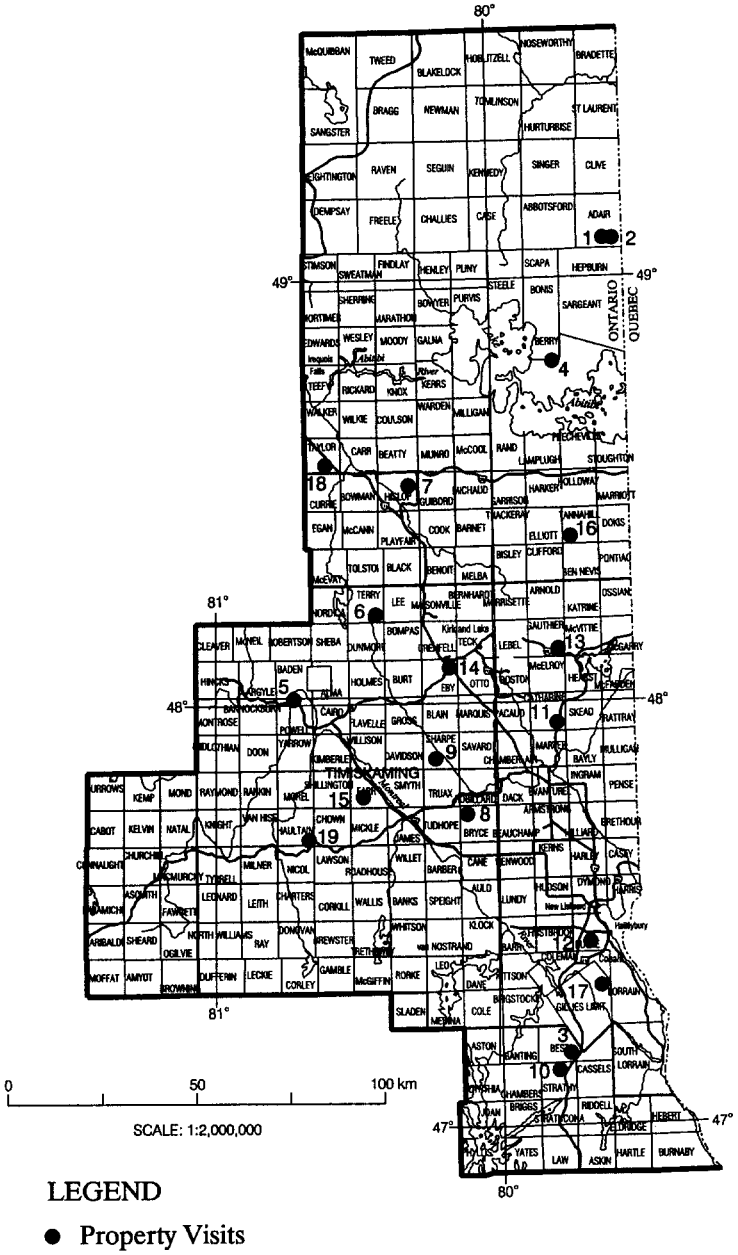

Figure 2. Property visits in the Kirkland Lake Regional Resident Geologist's District - 1997

Ontario

ONTARIO GEOLOGICAL SURVEY
Resident Geologist's Program – 1997

Sudbury Resident Geologist's District

by

M. Cosec and S. Buckley

1998

Sudbury District – 1997

M. Cosec[1], S. Buckley[2]

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Introduction

The Sudbury District extends from Spanish in the west to the Quebec border in the east, and from 90 km north of Sudbury to Port Severn in the south, across to Deep River. The district covers parts of 5 different geological environments, offering a wide range of attractive exploration challenges in an area of established mining, good communication lines, stable communities, and a skilled workforce.

The district gained an area equivalent to approximately 40 geographic townships, primarily along the upper Ottawa Valley.

The production of nickel and copper by Inco Limited and Falconbridge Limited dominate mining activities in the Sudbury District. Other major sources of production are 2 large industrial minerals quarrying operations, one for silica near Killarney, the other for dolomite on Manitoulin Island.

At the end of 1997 there were 11 257 claim units in good standing in the Sudbury Mining Division.

Sixteen prospectors in the district received Ontario Prospectors Assistance Program (OPAP) grants.

Mining Activity

Mining and mine exploration continued at relatively the same level as 1996.

At the beginning of 1997, a growing number of metal analysts and market strategists were predicting an excellent year for nickel prices. Nickel inventories were perceived to decline and the price of the metal could rise as high as US$6.00 per pound in the second half of the year (The Globe and Mail, January 22, 1997). Yet, during 1997, nickel traded in the range of US$3.69 to US$2.65 per pound. The average price of nickel in 1997 was US$3.14 per pound, compared with US$3.54 per pound in 1996. Copper traded in the range of US$1.23 to US$0.77 per pound; its average price in 1997 was US$1.03 per pound, the same as in 1996. The depressed metal prices are believed to be caused by the dumping of nickel by Russian producers, in an effort to obtain hard currency to repair outdated technology at their own metal operations. Other reasons could be an increased supply of stainless steel scrap and the collapse of Asian markets at the end of the year.

Inco Limited and Falconbridge Limited operated 17 underground mines and 1 open pit mine in the district in 1997.

In this report, nickel, copper, and the platinum group metals will be abbreviated to Ni, Cu, and PGM, respectively.

INCO LIMITED

In the Sudbury area in 1996, Inco Limited operated 11 underground mines, 1 open pit mine, 2 mills, 1 smelter, 4 refineries, 3 sulphuric acid plants, 1 liquid sulphur dioxide plant, and 1 oxygen plant (refer to Figure 1).

Production figures for the company's Ontario Division in 1996 were 230 million pounds Ni and an equivalent amount Cu. In 1997, that number is expected to be 214 million pounds of Ni and an equivalent amount Cu. This is due, in part, to a 26-day strike by United Steelworkers of America Local 6500 followed by a 21-day maintenance shut down. The strike is estimated to have cost the company US$20 million (The Sudbury Star, August 27, 1997).

The operating mines and their rated ore production capacities are as follows: Copper Cliff North Mine, 2625 tons per day; Copper Cliff South Mine, 2900 tons per day; Crean Hill Mine, 2100 tons per day; Creighton Mine, 3850 tons per day; Frood Mine, 3300 tons per day; Little Stobie Mine, 4875 tons per day; McCreedy East Mine, 1800 tons per day; McCreedy West Mine, 2275 tons per day; Garson Mine, 2000 tons per day; Stobie Mine, 10 800 tons per day; Lower Coleman Mine, 2675 tons per day; and Whistle Mine, 5000 tons per day (MNDM 1997).

Late in 1997, Inco Limited launched a major restructuring effort. The company will phase out high cost operations and reduce employment levels at its Ontario and Manitoba divisions. No layoffs are expected as 500 Sudbury area employees will leave through normal attrition. Three local mines will close or be placed on stand-by in 1998. These include the Levack, McCreedy West, and Little Stobie mines (The Sudbury Star, November 19, November 24, 1997).

Operations at the Whistle open pit mine were placed on stand-by late in 1997, but production is expected to resume in 1998 as the orebody has yet to be exhausted (G. Morrison, Inco Limited, personal communication, 1998)

All the Inco Limited Sudbury ore is milled at its Clarabelle Mill, at a rated capacity of 45 000 tons per day. Here, the ore is upgraded from 1.2% Ni and 1.2% Cu to a combined total of 7% concentrate..

The Copper Cliff Mill provides flotation facilities used to separate bulk Ni–Cu concentrate produced by the Clarabelle Mill and upgrades the concentrate to 20% combined Ni and Cu. An additional precious–PGM refinery is located at Port Colborne, Ontario.

The company employs 6400 people locally.

FALCONBRIDGE LIMITED

Falconbridge Limited produced nickel, copper, platinum group metals, and other by–product commodities from 6 operating mines in the Sudbury area (refer to Figure 1). Production from the company's Sudbury Division in 1996 was 42 000 t Ni and 16 500 t Cu (smelter output) from 2 814 000 t of ore milled (Falconbridge Limited, Annual Report 1996, 1997). The company also produces approximately 300 000 t of sulphuric acid per year from its sulphuric acid plant.

During 1996 (1997 figures were unavailable at the time of writing), the mines, and corresponding production rate for each are as follows: Fraser Mine, 788 000 t/yr; combined Craig and Onaping mines, 1 297 000 t/yr; Lockerby Mine, 92 000 t/yr; Strathcona Deep Copper Mine, 449 000 t/yr; and Thayer–Lindsley Mine, 188 000 t/yr. The average ore grade was 1.77% Ni and 1.93% Cu. Total proven ore reserves remaining were given as 14 215 000 tonnes at 1.63% Ni and 1.53% Cu, in early 1997 (Canadian Mines Handbook, 1997–98).

Ore from all Falconbridge Limited mines is concentrated at the Strathcona Mill, which has a milling capacity of approximately 10 000 tons per day. The concentrate is trucked to the company's smelter in Falconbridge. Copper–nickel matte is then shipped from the Falconbridge smelter to the company's nickel refinery in Kristiansand, Norway. Concentrate from Raglan Mine in northern Quebec is expected to arrive at the Falconbridge smelter in April 1998.

A 24–day strike by CAW/Mine Mill Local 598 in August cost the company approximately $18 million (The Sudbury Star, October 18, 1997).

The company's Sudbury Division workforce in 1997 was 2100. It expects to reduce its workforce by 24% as it trims its operating costs from US$2.02 per pound Ni in early 1997 to US$1.30 per pound Ni in the year 2000 (Canadian Mining Journal, October 1997, p.8,9).

INDUSTRIAL MINERALS PRODUCTION

Several industrial mineral commodities were produced throughout the district in 1997. These included dolostone, silica, flagstone, landscape stone, and sundry varieties of coloured aggregate.

Unimin Canada Limited operates the Badgeley Island high–grade silica quarry, located 4 kilometres west of the village of Killarney. Annual production is approximately 430 000 tons. The coarse silica is shipped to Midland, Ontario and to Ashtabula, Ohio for further processing into silica sand for the glass industry.

Lafarge Canada Incorporated operates a large quarry on the Mississagi Strait, Dawson Township, on the western tip of Manitoulin Island. Massive dolostones of Amabel Formation are excavated in a single lift of approximately 17 m. In 1997, the company shipped more than 3 million tonnes, of which 70% was used for construction aggregate and 30% for metallurgical purposes.

OCL Trucking and Excavating Limited provided Inco Limited with smelter flux from the Rolston silica quarry in Sheguiandah on Manitoulin Island and from the Alexander quarry in Baldwin Township. Annual production is expected to be approximately 80 000 tons with grades of 95 to 99 percent SiO_2.

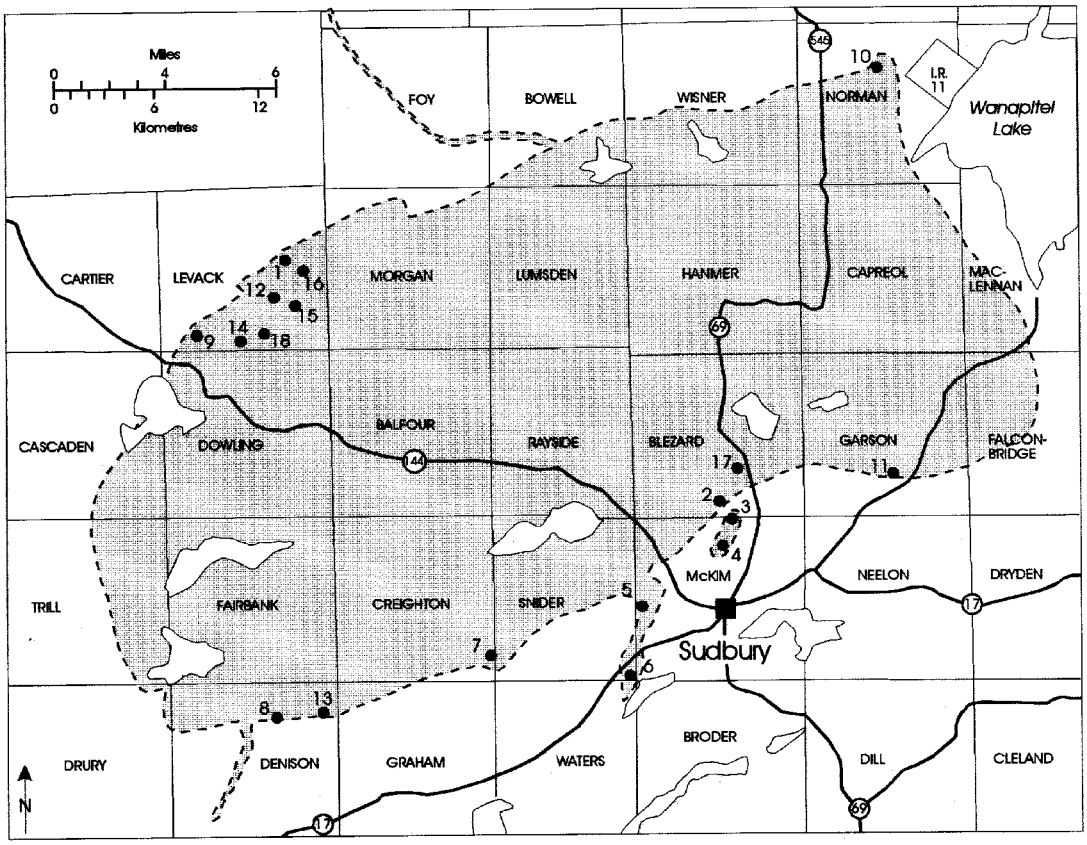
Allstone Quarry Products Limited removed approximately 1500 tons of migmatitic gneiss from its landscape stone quarry in Bigwood Township. The material is shipped to the company's stoneyard in Schomberg, where it is sandblasted and partially dressed for use as decorative landscape material.

Canadian Colour Rock Incorporated (formerly Hercules Stone Limited) extracted several hundred tons of Silurian Manitoulin Formation limestone from the Foxey Quarry in Gordon Township on Manitoulin Island. The rock is used as curbing stone, for walkways, and in landscaping. Several tons of breccia from Aylmer Township were also extracted. This breccia consists of relatively small, angular fragments of buff-coloured Gowganda Formation siltstone in an orange-coloured hydrothermal quartz and carbonate matrix. This material has previously been used locally as an ornamental facing stone. The company recently purchased new equipment for its plant on Manitoulin Island.

Flagstone is produced from several seasonal operations in the Parry Sound and Huntsville areas, the largest of which is Mill Lake Quarry Limited. This quarry has been in operation for more than 80 years.

L. Alarie and Sons Limited opened a trap rock quarry in Neelon and Dryden townships. This property was previously evaluated for the Canadian Pacific Railway Company Limited as hosting 40 to 50 million tons of trap rock as railway ballast (Scalia, P.R. 1993).

Several companies produced coloured aggregate for decorative landscape material. Most of this stone is shipped to southern Ontario or U.S. markets. Considerable amounts of sand and gravel were also extracted by numerous companies throughout the Sudbury District for various purposes.



Inco Limited

(Ni,Cu,Co,Au,Ag,PGM,Se,Te,SO_2,H_2SO_4)

1) Lower Coleman
2) Little Stobie
3) Stobie
4) Frood
5) Copper Cliff North
6) Copper Cliff South
7) Creighton
8) Crean Hill
9) McCreedy West
10) Whistle
11) Garson
12) McCreedy East

Falconbridge Limited

(Ni,Cu,Co,Au,Ag,PGM,H_2S)

13) Lockerby
14) Onaping
15) Fraser
16) Strathcona
17) Thayer Lindsley
18) Craig

----- Outline of the base of the Sudbury Igneous Complex, showing some of the Offset Dikes

Figure 1. Producing Mines in the Sudbury area, 1997.

Advanced Exploration

Underground exploration and development work continued at most of the producing mines in the Sudbury area throughout the year. Development properties of notable interest are mentioned below.

FALCONBRIDGE LIMITED

The majority of work performed during the year consisted of definition drilling to upgrade previously known probable and possible reserves to proven reserve status.

The company conducted significant underground exploration from its Onaping and Craig mines in the North Range of the Sudbury Igneous Complex.

Development continued at the Lockerby Mine in order to bring the mine into full production by 1998. It will be expected to yield 8000 t Ni and 3,500 t Cu annually (Giancola, 1997).

INCO LIMITED

Open pit development continued at the Gertrude deposit. Work consisted primarily of stripping waste rock throughout the year. All the capping has been removed and the ore has been exposed. Some development muck has been stockpiled at the Creighton Mine. The mine is currently on stand-by status (G. Morrison, Inco Limited , personal communication, 1998).

Shaft-sinking to a depth of 5000 feet was completed at the Victor Mine in March of 1997. Drilling stations have been established every 1000 feet. Recent drilling discovered a new zone of mineralization apart from the Main Zone and the Deep Footwall Zone. The new zone is located 600 feet south of the Main Zone, has a dip extension of 1200 feet, and is open at depth. Approximately 125 000 feet of underground exploration diamond drilling is expected.

Exploration of the WD 16 property, Wisner Township; and the Foy property, Bowell Township, have been completed. Development of these mines is expected to occur in 1998 in order to replace lost production from the Whistle Mine, when it is exhausted.

Exploration Activity

The Sudbury Resident Geologist's District encompasses approximately 45 000 square km and includes over 340 townships. Please refer to Figure 2.

Geologically, the area is underlain by rocks of Archean, Proterozoic and Paleozoic ages. The Grenville Front bisects the districts into fairly equal, yet dissimilar parts.Exploration by major mining companies concentrated on nickel, copper and precious metals hosted in the Sudbury Igneous Complex. Several junior mining companies were active in the area and focussed their attention primarily on gold exploration. Prospecting activity centred on gold, base metals, and industrial minerals.

Table 1. Exploration activity in the Sudbury District in 1997 (keyed to Figure 2).

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

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1	Alex W. Clark and associates	Papineau Tp. (garnet)	Samp, Pr
2	Blake, F.	Belfast, Le Roche tps.	Pr
3	Boulard, V.	Parkin, Fraleck, Grigg tps. (stone)	Pr
4	Brady, J.	Aylmer, Rathbun, Hutton, Parkin tps. (Au, base metals)	Pr
4	Brady, J.	Hart Tp. (skarn-Co, Zn)	Str, Tr, Samp
5	Club Resources	Louise Tp. (Ni, Cu, PGM)	Pr, Str, Tr, GC
6	Currie Rose Resources Incorporated	Davis, Scadding tps. (Au, Cu)	DD, Assays
7	D. & H. Consulting Services Incorporated	Afton Tp. (Au, Co)	Pr
8	Ditem Explorations Incorporated	Mattawan, Antoine tps. (diamond)	Pr, AM
9	Falconbridge Limited	Norman Tp. (Ni, Cu, PGM)	DD
10	Fielding, C.	Broder Tp. (Ni, Cu, PGM)	Str, Tr, Samp, Lc, GM, GEM
11	Fielding, R., Fielding, T.	Maclennan, Scadding tps. (Au)	Pr, GEM, GM

Table 1. cont'd. Exploration activity in the Sudbury District in 1997 (keyed to Figure 2).

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
12	Flag Resources (1985) Limited	Mackelcan Tp. (Au, Cu)	DD, Assays
12	Flag Resources (1985) Limited	McNish Tp. (Au, Cu)	DD, Lc, Grav
13	Fudge, D.	Widdifield Tp. (sand, gravel)	Pr
14	Gervais, R.	Roberts Tp. (base metals)	Pr
15	Gorgichuk, G.	Porter Tp. (skarn)	Pr
16	Hill, A.	Stull, Tp. (barite)	Str, Tr, GC
17	Ike Burns Exploration	Nairn Tp. (Ni)	Pr
17	Ike Burns Exploration	Venturi Tp. (carbonatite)	Pr, Str, Bulk
18	Inco Limited (Dowling North)	Dowling Tp. (Ni, Cu, PGM)	DD
18	Inco Limited (Trillabelle)	Trill Tp. (Ni, Cu, PGM)	DD
18	Inco Limited (south of Murray Mine)	McKim Tp. (Ni, Cu, PGM)	DD
18	Inco Limited (Copper Cliff Offset)	Broder Tp. (Ni, Cu, PGM)	DD, magnetolluric EM, Assays
18	Inco Limited (Victor Deposit)	MacLennan Tp. (Ni, Cu, PGM)	UG
19	Jarvis Resources Limited	Scadding Tp. (stone)	Pr
20	Kosy, R.	Ulster Tp. (Cu)	Str, Tr, GC
20	Kosy, R.	Munster Tp. (Ni, Cu)	Str, Tr
21	Lahaie, G. (Black Crystal)	Struthers Tp. (stone)	Samp
22	Lake Superior Resources	Flett Tp. (Ti, stone)	Pr
22	Lake Superior Resources	Turner Tp. (Au)	Pr
23	Lashbrook, R.	Stewart Tp. (stone)	Pr
24	Leblanc, A.	Janes Tp. (Ni, Cu)	VLFEM
25	Leclair, A.	Stralak Tp. (Cu, Ni)	VLFEM, GM
26	Loney, T., Loney, M.	Wanapitei Lake Area (Au)	Pr
27	Loney, M., Loney, T., Wright, B.	Scadding Tp. (Cu, Au)	Str, Tr, GC
28	Mantha, H., Mantha, P.	Widdifield Tp. (stone, Ti)	GM, GL
29	Meridian Resources Incorporated	Parkin Tp. (Au)	Bulk
30	Millstream Mines Limited	Falconbridge Tp. (Ni, Cu, PGM)	Pr
31	Orchard, R., Hall, M.	Marquette Tp. (stone)	Pr
32	Owen, J.	Nairn, Baldwin tps. (trap rock)	Bulk
33	Racicot, F.	Janes and adjacent tps. (Ni, Cu, PGM)	Pr
34	Rainbow Petroleum Corporation	Falconbridge Tp. (Cu, Ni, Co, Au)	DD, DGP, GEM
35	Richland Mines Incorporated	Butler Tp. (vermiculite)	Str, Tr, GC
36	Richland Mines Incorporated and Highpoint Resources Incorporated	Waters Tp. (Au, Cu)	Pr, DD
37	Salo, G.	Truman, Dieppe tps. (Au, Co, Cu, Ni)	Pr
37	Salo, G.	Hutton, Parkin, Wisner, and Norman tps. (Au)	Pr
38	Shouinard, G., Montreaux, R.	Mattawan, Antoine tps. (Ni, Cu)	Pr, Tr, GC
39	Smith, G.	Antoine Tp. (kyanite)	Str
40	Stringer, E.	McKinnon Tp. (Au)	Pr
41	Sumic Exploration	Benny Belt Area (base metals)	Pr, Lc, GM, GEM
42	Sven, D.	Baldwin Tp. (Ni, Cu)	Pr

Table 1. cont'd. Exploration activity in the Sudbury District in 1997 (keyed to Figure 2).

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
43	Temex Resources Limited	Clement, Scholes, Macbeth tps. (Au, base metals)	Pr
44	Tenajon Resources Corporation	Macbeth, McNish, Clement, Pardo, Turner tps. (Au)	Pr, GC
45	Weiss, W.	Gilbert Tp. (base metals)	Tr, GC
46	Wright, B.	Kelly, Janes, Davis, Crerar tps. (Ni, Cu, PGM)	Pr
46	Wright, B.	Janes Tp. (Ni, Cu)	Str, Tr, Samp

J. BRADY

J. Brady had several exploration targets in 1997. He conducted stripping, trenching, and lithogeochemical sampling on the Iron Mask skarn occurrence in Hart Township. It is hosted in Espanola Formation limestone and Serpent Formation arenite intruded by Nipissing gabbro. Ore minerals present include sphalerite, pyrite, galena, chalcopyrite, and cobalt arsenides. Work has also continued on properties in Harty and Hess townships, which are underlain by a possible extension of the Foy offset dike of the Sudbury Igneous Complex. As well, several OPAP-funded exploration programs in Aylmer, Rathbun, Hutton, and Parkin townships continued.

MERIDIAN RESOURCES INCORPORATED

Meridian Resources Incorporated continued exploration work on its Golden Pine property in Parkin Township.

In particular, the company completed a 500 ton bulk sample from the "A" and "A-1" zones, and was shipped to the St. Andrews Goldfield Limited mill near Timmins. Gold mineralization on the property is hosted in lenses of disseminated, fine-grained pyrite in silicified Archean intermediate metavolcanic rocks.

FLAG RESOURCES (1985) LIMITED

Flag Resources (1985) Limited spent much of the year focussing their exploration efforts on their Wolf Lake gold-copper bearing breccia in Mackelcan Township, located in the area of the Wanapitei magnetic anomaly. The breccia occurs in a 1000-foot long structure along the west shoreline of Wolf Lake. Diamond drilling, core logging, and lithogeochemical sampling were conducted. Assay results released by Flag from diamond drill holes in the Campsite Zone at Wolf Lake ranged from 2.3 g/t Au with 0.422% Cu (over 3 feet) to 7.8 g/t Au with .865% Cu (over 29.5 feet). A later program of definition drilling was initiated to more precisely delineate the location of the structure. Exploration extends north and southeast (where similar structures have been identified), and is similarly continuing in McNish Township, where a coincident magnetic and gravity anomaly exists in an inlier of Archean-aged rocks.

Future exploration is also expected from Golden Briar Mines Limited, which, in a recent agreement with Flag Resources (1985) Limited, has committed to long term exploration programs on claims owned by the latter in Rathbun, MacBeth, and McNish townships.

CURRIE ROSE RESOURCES INCORPORATED

Currie Rose Resources Incorporated completed 8000 feet of diamond drilling on its Brady option in Davis Township. This 25-claim group lies immediately southeast of the former Norstar gold and

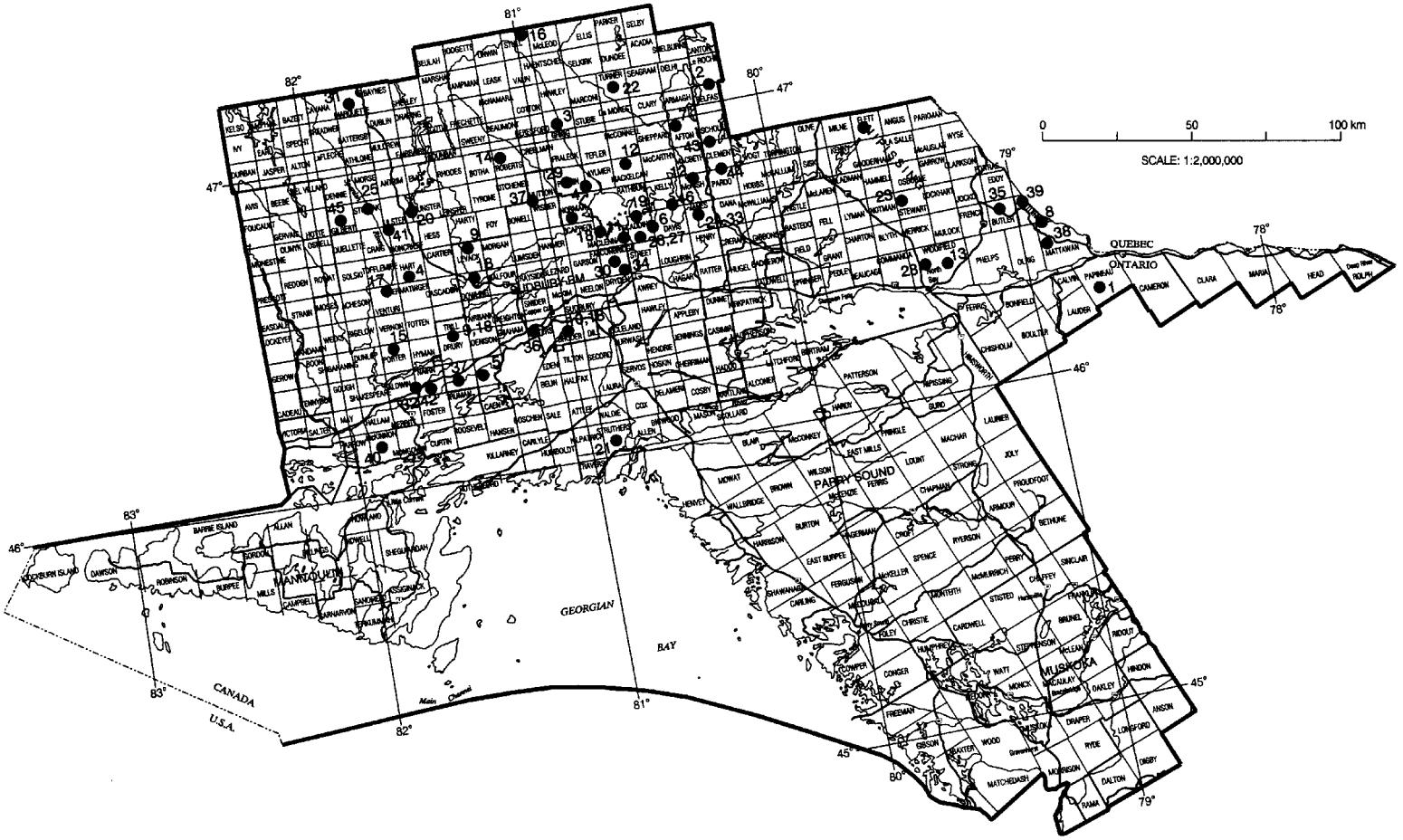


Figure 2. Exploration activity in the Sudbury District.

copper mine. The discovery gossan returned assays grading 0.42 ounce Au per ton , 0.39 ounce Ag per ton, and 4.46 percent Cu (George Cross Newsletter Limited, No. 14, January 1997). The company identified a shallow dipping gold zone truncated by a fault. Subsequently, the diamond drilling program was relocated to the former Scadding gold mine in Scadding Township, which had recently been acquired from Central Asia Goldfields Corporation. To date, diamond drill core of several holes contained visible gold from a zone south of the Scadding Mine South Zone. The program is expected to continue until April 1998 (P. McLean, Consulting Geologist, personal communication, 1997).

RICHLAND MINES INCORPORATED

Richland Mines Incorporated completed stripping, trenching, and sampling on its vermiculite option in Butler Township. On the "A" Zone, reserves calculated to a depth of 50 feet, total 144 000 tons with the deposit remaining open at depth. Initial testing returned grades of 50 to 90% vermiculite with milling recovery rates of 95% (Richland Mines Incorporated, press release, July 1997). Results of exploration and beneficiation tests from the "B" Zone were unavailable at the time of writing.

FALCONBRIDGE LIMITED

The company conducted diamond drilling on 9 targets on the Sudbury Igneous Complex, for a total of 43.3 km. These properties include the North Range Depth, Clear Lake, Trill, Drury, Norman West, Lockerby Depth East, Wisner, Bowell, and Creighton. Diamond drilling in excess of 50 km is expected to continue on these properties in 1998 (D. Duff, Falconbridge Limited, personal communication, 1998).

INCO LIMITED

Inco Limited conducted exploration on several of its Sudbury holding throughout 1997, but results were especially notable from diamond drilling programs on the Copper Cliff Offset dike. In July, the company announced it had intersected over 30 m of greater than 2% Ni at its Kelly lake property in Broder Township. The bulk of the mineralization is above 1200 m in depth. In October, a second zone at 1370 m depth, 13 to 28 m in thickness, with grades varying from 1 to 2.8% Cu and 1 to 2.2% Ni was intersected in four diamond drill holes. Assay results also included high concentrations of Au and PGM. The second zone was drilled over 355 m of strike length and 400 m down dip. It is open to the south. Another discovery was made while diamond drilling 1800 m north of the Copper Cliff South Mine, at a depth of 900 m. Widths of 7.8 m grading 4.2% Cu and 5.9% Ni, and 8.4 m of 6.8% Cu and 1.7% Ni were intersected. More exploration will be conducted from a drift being developed at the 975-m level of the Copper Cliff South Mine.

Deep diamond drilling programs were also conducted on the Trillabelle property , Trill Township, in the west end of the Sudbury Igneous Complex; south of the former Murray Mine, McKim Township; and the Dowling North property, in Dowling Township.

Table 2. Assessment files received in the Sudbury District 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
Foucault	Ardiel, M.	1994	Lc	9670.000161	SP002
Baldwin	Barry, A.	1995	Lc, VLFEM, GM	2.16997	SP009
Baldwin	Barry, A.	1995	Samp, VLFEM, GM, GC	OP95-257	SP010
Norman	Barry, L.	1996	Str, Tr	2.17195	SP024
Shakespeare	Blue, P.	1996	Samp, GC	2.17150	SP003
Shakespeare	Blue, P.	1995	Pr, Samp, GC	2.16895	SP002
Hart	Brady, J.	1997	Str, Tr	2.17883	SP004
Hess/Harty	Brady, J.	1997	Str, Tr	2.17346	SP010
Hess	Brady, J.	1996	Str, Tr	9670.00173	SP009
Janes	Brady, J.	1997	Bulk, Samp	2.17347	SP007
Parkin/Aylmer	Brady, J.	1996/97	Str, Tr, Samp	9770.00009	SP054
Parkin	Brady, J.	1996	Tr, Str	2.17146	SP055
Hart	Brady, J., Brady, M.	1995	Pr, Tr, Str, Samp	OP95-206, OP95-207	SP003
Hutton	Brisson, A.	1996	Str	2.17099	SP030
MacL:ennan	Brisson, A.	1996	Str, Tr	2.17196	SP015
Curtin	Brunne, D.	1995	Str, Samp, GC, Pr	OP95-250	SP019
Curtin	Brunne, D., Stringer, R.	1995	Str, Samp, GC, Pr	2.17084	SP017
Falconbridge	Charron, R., Jerome, E.	1997	Lc, GM	2.17317	SP021
Davis	Currie Rose Resources Inc.	1996/97	DD, GC	2.17748	SP048
Baldwin	D & H Consulting Services Inc.	1994	Samp, GC	2.16797	SP008

Table 2. cont'd. Assessment files received in the Sudbury District in 1997.

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Widdifield (West)	DBC Aggregates Limited	1995-97	Bulk, GC	2.17331	SP002
Neelon	DBC Aggregates Limited	1995	Str, GC, DD, Bulk	2.17130	SP002
Street	Emerald Isle Res. Inc./ Stralak Res. Inc.	1995	Str, DD, Bulk	OMIP95-053	SP015
Clary	Falconbridge Limited	1996	GL, VLFEM	2.17012	SP001
Macbeth	Falconbridge Limited	1996	GL, VLFEM	2.17011	SP002
Mackelcan	Flag Resources (1985) Limited	1996/97	DD, GC	2.17073	SP014
Mackelcan	Flag Resources (1985) Limited	1997	DD, GC	2.17250	SP016
Mackelcan	Flag Resources (1985) Limited	1996/97	DD, GC	2.17106	SP015
McNish	Flag Resources (1985) Limited	1997	Lc, Grav, DD	2.17133	SP005
McNish	Flag Resources (1985) Limited	1996	Lc, Grav	2.16951	SP004
McNish/Kelly	Flag Resources (1985) Limited	1996	DD	9670.00169	SP003
Rathbun	Flag Resources (1985) Limited	1996	DGP	2.16925	SP028
Conger et al.	Forster, J.	1995	Pr, GL, Str	OP95-152	Conger-9
Scadding	Graham, R.	1995	DD, Pr, Samp, GC	OP95-004	SP028
Scadding	Graham, R.	1995	DD, Pr, GC	2.16866	SP026
McAuslan	Hardie, D.	1996	VLFEM, GRA, Samp, Lc	2.17304	SP001
McAuslan/Parkman	Hardie, D.	1995	Lc, VLFEM plan outline, Samp, Pr	OP95-293	SP002
Norman	Inco Limited	1996	DD, GC	2.17135	SP023
McKinnon	Jarvis Resources Ltd./ Ike Burns Exploration Corp.	1997	DD, GC	2.17328	SP009
Poitras et al.	Komarechka, R.	1995	GL, Samp, GC, garnet benefication, Beep, GL	OP95-269	SP001
Stralak	Leclair, A.	1996/97	Pr, GM, GC	2.17572	SP001
Laurier et al.	Mandziuk, Z.	1995	Str, Samp, DD	OP95-340	SP001
Antoine et al.	Marum Resources Inc./Ditem Exploration Inc.	1996	AM	2.17302	SP001
Foster	Naples, K.	1997	Lc, Samp, GC	2.17548	SP013
Davis	Pelangio Larder Mines Ltd.	1996	Pr, Samp, Lc	2.16926	SP046
McKinnon et al.	Racicot, F.	1995	Pr, Samp, GC	OP95-291	SP010
Waters	Rauhala, J.	1996	Tr, GC	9670.00172	SP008
Rhodes	Rieux, M.	1995/96	Str, Tr, Samp, GC	2.17561	SP012

Table 2. Cont'd. Assessment files received in the Sudbury District in 1997.

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Ratter et al.	Rose, E.	1995	Pr, GL, Samp	OP95-094	0011
Gladman	Roy, T.	1996	Str, Tr	2.17275	0011
Hutton et al.	Salo, G.	1996/97	Pr, GC, Samp	2.17131	SP031
Hutton et al.	Salo, G.	1995	Samp, Pr	OP95-230	SP032
Truman/Dieppe	Salo, G.	1996	Pr, Str, Tr, Samp, GM, VLFEM, Petrography, GRA, GC	2.17159	SP010
Dieppe	Salo, G.	1995	Tr, Str, GM, GL, Samp, GC, Petrography	OP95-230	SP011
Mattawan	Shouinard, G.	1996	Tr, Str, GC, Pr	2.17145	SP001
Antoine	Smith, G.	1997	Pr	2.17540	SP002
Sinclair	Stewart, R.	1997	GL, Lc	2.17638	0010
Franklin	Stewart, R.	1995-97	GL	2.17318	0010
Mongowin	Stringer, E. (Garson Resources Ltd.)	1996	Lc, VLEM	2.17103	SP014
Curtin	Stringer, R., Brunne, D.	1996	Pr, DD, GC	2.17316	SP018
Curtin	Stringer, R.	1995	Str, Samp, GC, Pr	OP95-249	SP020
Bonfield et al.	Surmacz, S., Hauseau, M.	1995	Samp, GC	OP95-15, 16	SP001
Burton	Trusler, J.	1995/96	GL	OP95-210	SP006
Davis	Van Lith, G.	1995	Pr, Str, Tr, Samp	OP95-259	SP047
Boon	WMC International Limited	1997	GP, Lc	2.17560	SP010
Salter et al.	WMC International Limited	1995	AM, Pr, Samp, GC	OM95-079	0023
Scadding	Wright, B., Kirkland Wright Gold Ltd.	1996	Lc, IP survey	2.16810	SP027
Botha	1074101 Ontario Incorporated	1997	GC	2.17559	SP006

Land Use Planning Activity

The purpose of this Ministry's involvement in Land Use Planning is to identify for other agencies, sites of past mining activities which may be hazardous, areas of high mineral potential, so that hazards and mineral potential can be considered in planning issues.

Land use issues in 1997 included providing background geological data for the deregulation of part of Wanapitei Provincial Park to permit mineral exploration, as well as several municipal official plans and forest resource management plans. Late in the year, the Ministry of Natural Resources "Lands for Life" initiative commenced. In 1998, this office will provide input on many candidate sites within the Great Lakes – St. Lawrence planning area.

District Office Staff and Activities

As a result of restructuring within the Resident Geologist program in 1997, the Sudbury District off ice is now staffed by M. Cosec, District Geologist, and S. Buckley, Geological Assistant. W. Meyer, former Resident Geologist, left the Ministry in June. During the year, the office was ably assisted by Experience Students R. Cecchetto, K. Holland, and B. Gammon.

Miss Buckley assumed the position of geological assistant for the district in the Fall of 1997. She was previously employed as a research assistant to M. Easton, Precambrian Geoscience Section, Ontario Geological Survey. She obtained her Bachelor of Science degree in geology from Carleton University in 1996.

W. Meyer was involved in several land use planning issues. These included a proposed expansion of Killarney Provincial Park, the deregulation of part of Wanapitei Provincial Park for mineral exploration, and submissions to several municipal plans. W. Meyer was an advisory member to Local Citizens Committee (formerly the District Advisory Committee) of the Sudbury district of the Ministry of Natural Resources. M. Cosec assumed the position on this committee in September 1997.

W. Meyer assisted in research with the Freshwater Ecology Unit of the Ministry of Natural Resources and the Department of Biological Sciences at Laurentian University to determine reasons behind pH anomalies in lakes within Killarney Provincial Park (Meyer et al., 1997).

In March, W. Meyer and M. Cosec attended the annual meeting of the Prospectors and Developers Association of Canada annual meeting in Toronto.

W. Meyer and T. Livingstone, former administrative assistant, along with R.P. Sage of the Ontario Geological Survey Precambrian Geoscience Section, completed plans to host the 1997 Institute of Lake Superior Geology conference, held at Laurentian University, May 6 through 11.

S. Buckley presented several posters at the GAC/MAC Conference held in Ottawa,May 19–21.

W. Meyer and M. Cosec frequently attended talks held by the Sudbury chapters of the Prospectors and Developers Association and Canadian Institute of Mining, Metallurgy, and Petroleum (Sudbury Geological Discussion Group).

M. Cosec presented a talk on Sudbury area geology and ore deposits to the Sudbury Rock and Lapidary Club January 14.

M. Cosec was appointed to the Sudbury/Manitoulin/Parry Sound Regional Economic Development Team. The purpose of the team is to identify, stimulate, and guide potential economic initiatives by sourcing funding through the Northern Ontario Heritage Fund Corporation. The Regional Economic Development Conference in Sault Ste. was attended on October 18 and 19. Advice was provided on four mineral development proposals.

M. Cosec attended the Institute of Lake Superior Geology conference April 7 through 10 in Sudbury, and the Northeast Regional Geoscience Symposium held April 21 and 22 in South Porcupine.

S. Buckley attended the Sudbury Geological Discussion Group Current Research Forum held at the Willet Green Miller Centre October 17.

Staff responded to approximately 2600 telephone inquiries and 2500 office inquiries. The increase in office inquiries is attributed to centralization of Mining Recorders offices to the Provincial

Recording Office at the Willet Green Miller Centre. Requests for information included geological information on a host of topics, exploration techniques, rock and mineral identification, mineral collecting, grant programs, staking and exploration activities in the district, prospector classes, geological tours, mineral potential evaluations, land use issues and land value questions.

Basic prospector training classes, held this year under the auspices of Cambrian College, attracted 12 students.

Throughout the summer, various field trips of the Sudbury Structure and other sites of interest were conducted. The groups ranged from Cambrian College, University of Michigan, University of Leicester, Fort Hayes State University, Upper Canada College, The Bishop Strachan School, to various employees from major companies.

Mining Week presentations of the theme “Minerals in Our Life” were delivered to several elementary schools.

Property Examinations

Table 3. Property visits conducted by the Sudbury District Office in 1997.

Number (keyed to Figure 3)	Property/Occurrence
1	G. Shouinard and associates, Mattawan Township (mafic intrusive)*
2	Inco Ltd., Whistle Mine, Norman Township (Ni, Cu, PGM)
3	R. Kozy, Ulster Township (Au, Cu)
4	Lake Superior Resources Corp., Flett Township (Ti, Va, Ni, Cu, stone)
5	Richland Mines Limited, Butler Township (vermiculite)
6	C. Fielding Property, Broder Township (Ni, Cu, PGM)*
7	Inco Ltd., Copper Cliff Offset, Broder Township (Ni, Cu, PGM)*
8	Club Resources Inc., Louise Township (Ni, Cu, PGM)*
9	W. Weiss, Gilbert Township (base metals)
10	Hotte Township (unmapped Archean felsic metavolcanic rocks)
11	H. & P. Mantha Property, Widdifield Township (Ti, stone)
12	T. & M. Loney, Scadding Township (Au)
13	A. Hill, Stull Township (barite)*
14	B. Wright, Janes Township (Ni, Cu)

**Properties visited more than once*

C. FIELDING PROPERTY

by S. Buckley

Mineral occurrences within the Nipissing gabbro are not uncommon. A large irregular body of gabbro in Broder Township south of Kelly Lake locally carries several small, high grade occurrences of Ni, Cu, PGM and Au.

The property belongs to C. Fielding, Sr., and occupies the majority of Lots 10 and 11, Concession V, Broder Township, $46^{0}25'38"$N latitude, $81^{0}03'05"$W longitude; UTM coordinates 496050E/5141370N. The Mineral Deposit Index Number is 41I06NE0892.

Access to the property from Sudbury is gained via Highway 17 west, turning onto Southview Road, thence southeast onto Jarvi Rd. (see inset, Figure 4). Continue on Jarvi Rd., which cuts through the property, for about 1.5 km. To access the mineral occurrences, turn southwest onto a narrow road, which can be identified by the "Jarvi Exploration" sign.

Previous work by C. Fielding includes outcrop stripping, trenching, lithogeochemical sampling, and geological mapping. Most recently, grid lines were cut and a ground magnetic geophysical survey was conducted.

Past exploration on the property (on file in the Sudbury Resident Geologist's Office) has been done by M.J. Fielding in 1974/75, in Lot 11, Conc. V, NE1/2, SE1/4. At this time, a geological survey was conducted on the claim, in addition to diamond drilling (1 DDH,167 feet). The showings discussed in this report are located east of this claim.

Broder Township is shown on Map P.57 and on various OGS compilation maps, including the Sudbury Mining Area (Map 2170), the Sudbury–Cobalt Geological Compilation (Map 2361), and Broder, Dill, Neelon and Dryden Townships (Map 2017). In addition, geological reports, GR9 and GR116 cover the area.

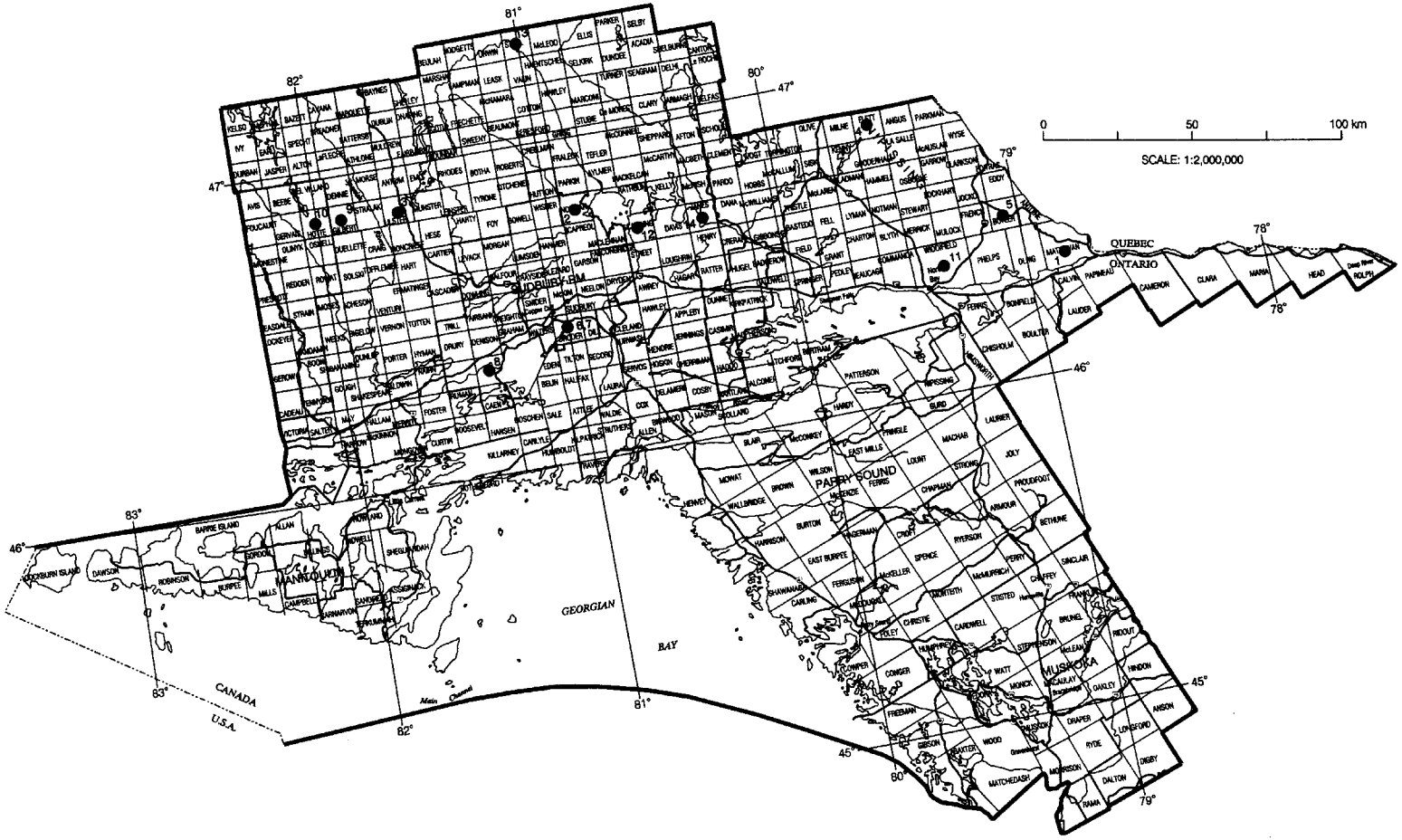


Figure 3. Sudbury District, Property visits conducted.

Regionally, the area is underlain by a large irregular-shaped body of Nipissing gabbro (see inset, Figure 4) and is located approximately 10 km south of the Sudbury Structure. The gabbro intrudes northeast-trending Mississagi quartzites of the Huronian Supergroup. To the south, the gabbro body is partially truncated by the Murray Fault.

On the property, the gabbro generally has a grey, weathered surface and a dark greenish-grey fresh surface. The rock is fairly equigranular, and has a medium-grained, gabbroic texture. Visible minerals present include: chlorite, greenish sub- to euhedral prismatic clinopyroxene, pinkish-white anhedral plagioclase, and minor biotite and actinolite. Chlorite is most common in 1-2 mm veinlets developed in variously oriented fractures which criss-cross the rock. Sulphides (mainly pyrrhotite) occur in trace amounts disseminated throughout the gabbro, however, there are several high grade occurrences (see locations 1 and 2 on inset, Figure 4).

The first occurrence is southwest of the creek which drains Kelly Lake (see Figure 4). Here, semi-massive to massive pyrrhotite and minor chalcopyrite mineralization occur within altered Nipissing Gabbro. The zone of mineralization, which appears to dip steeply to the west, is best exposed along the northwest wall of a pit (unit 3a). The rock has a dark red to purple weathered surface and a metallic, pinkish-grey fresh surface. Trace to minor amounts of chlorite, blue quartz and plagioclase are also present. Lying above this zone is a red to purplish weathered rock that has a gossan-like crumbly texture in places and blue quartz, along with some pyrrhotite (unit 3b). The contact with the higher grade mineralized zone below appears to be relatively sharp. Within 1-2 metres of the mineralized zone (units 3a and 3b), the gabbro is altered to a more felsic rock containing substantial amounts of blue quartz and disseminated pyrrhotite (unit 1b). The contact with the more common Nipissing gabbro (unit 1a) is gradational over tens of centimetres.

A 20-30 cm wide trondhjemitic dike (unit 2a), oriented 210°/46°W, intrudes the gabbro and appears to be truncated by the mineralization. It is most easily recognized by it's pinkish-white weathered surface. Minerals present include albite, quartz, and trace potassic felspar. In addition, the dike contains greenish inclusions (about .5 to 1 cm in size) of Nipissing gabbro, comprised mainly of chlorite and actinolite. Inspection of this dike in hand sample did not reveal any pyrrhotite, however. Hematite alteration was observed along fractures in the rock.

Another mineralized zone is located on the western end of the same outcrop and is likely a subsurface extension of the previously discussed zone. Minor rusty staining occurs on the surface between the two areas. One unique feature about this second zone is that a patch of whitish-weathered igneous rock (unit 2b) very similar to the trondhjemitic dike (unit 2a) occurs around the edge of part of the mineralization. A hand sample (CF-10) taken from here reveals minor amounts of disseminated pyrrhotite, which seems to have an affinity for the mafic minerals in the rock (chlorite and amphibole). The trondjemite here may be genetically related to the dike. A detailed petrographic and geochemical study should be carried out to determine this.

Showing #2 (see inset on Figure 4) is located on a different outcrop about 150 metres to the northeast, across the creek. Here, massive pyrite and pyrrhotite mineralization occur within a red to purplish weathered vein (about 20- 30 cm wide) oriented about 236°/65° NW. The vein is approximately 30 m long before it disappears under overburden. A narrow (15 cm wide), pinkish-white, weathered dike resembling the trondjemite from the previous showing (although slightly more mafic) is in contact with the north, and parts of the south sides of the vein. Sample CF-9, taken from this showing contains trace to minor amounts of disseminated pyrite and pyrrhotite. Several unmineralized dikes branch off from the main dike associated with the mineralized vein. The Nipissing gabbro at this showing is very similar to the previous one (unit 1a). However, the chloritic veinlets appear to be more numerous in this outcrop. Pyrite, with lesser amounts of pyrrhotite and chalcopyrite, were observed at this locality. Assay results obtained by C. Fielding have also revealed elevated amounts of gold. (Assays from this study were unavailable at the time of writing.)

It is not known at present the genetic relationship, if any, between the trondjemitic dikes and the mineralization. However, future exploration on the property and elsewhere in this gabbroic body

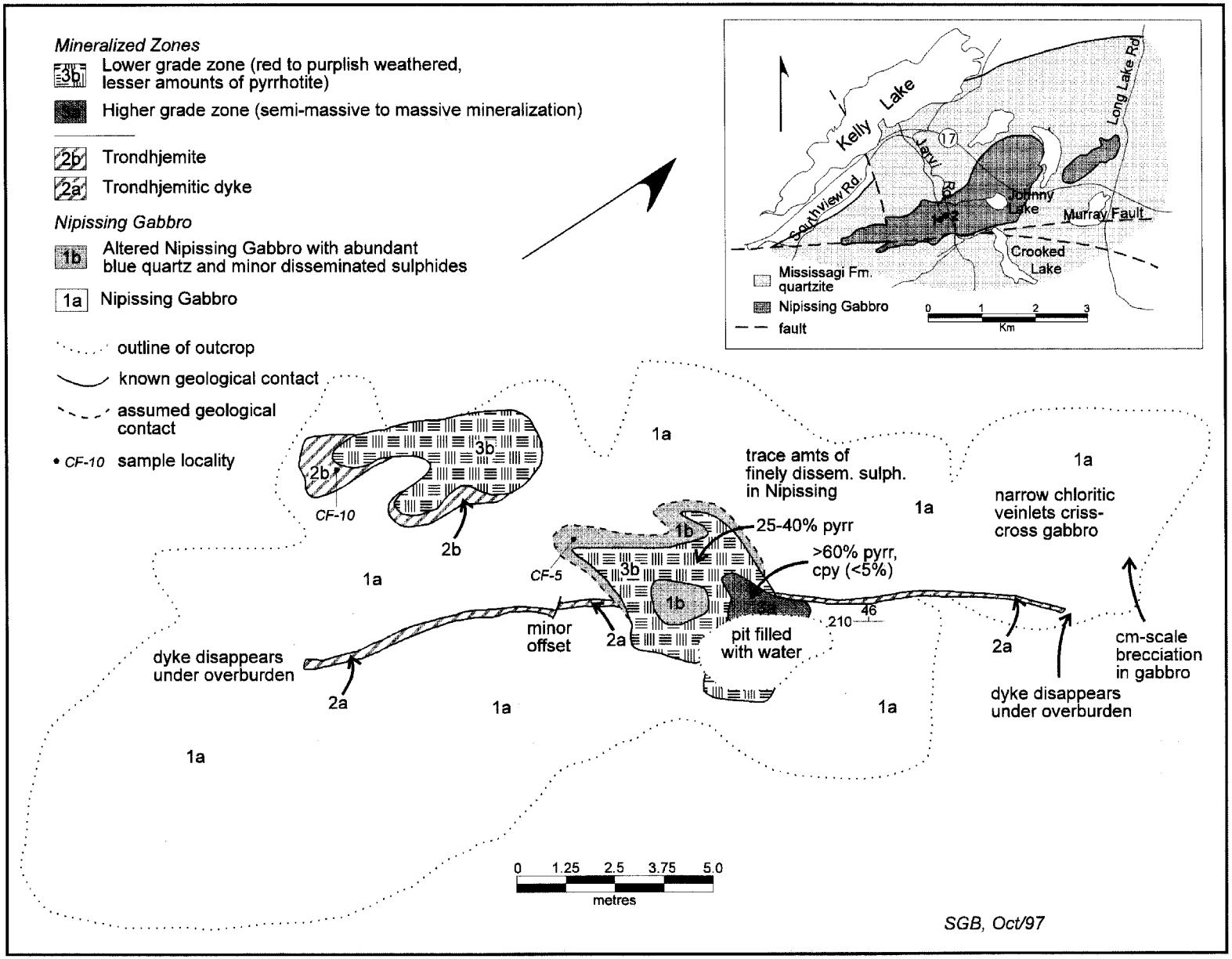


Figure 4. Geology of Showing #1 on the C. Fielding Property, Broder Township

should include a closer look at any dikes that are found. It must be noted that the Copper Cliff Offset dike is truncated by faulting about 1200 m to the east–northeast of the main showing, and its possible subsurface expression should also be examined.

G. SHOUINARD PROPERTY

by M. Cosec

Over the past three years, several differentiated mafic to ultramafic intrusions have been examined for nickel, copper, PGM, and dimensional stone. One such intrusion is located in north-central Mattawan Township. G. Shouinard and R. Montreuil, both of Mattawa, hold approximately 380 ha of staked and patented claims in the area. R. Komarechka of Sudbury, also holds several claim-units on the intrusion. Recent exploration efforts centred on lots 19 and 20, Concession XII, Mattawan Township, 46°25'00"N latitude, 78°50'00" W longitude; UTM coordinates 666000E/5142000N. No MDI number has yet been assigned.

Access to the property is gained by taking Highway 533 north and west of Mattawa for a distance of 10 km, thence north on a gravel road for approximately 6.5 km. At this point, the gravel road ends. An all-terrain vehicle trail leads into the property for approximately 4 km. The northern part of the property is easily accessed by a gravel road to Ducharme Lake, from Highway 533.

Hudson Bay Exploration and Development Company Limited conducted overburden sampling, ground geophysical surveys, and a limited amount of diamond drilling in the area from 1985 to 1987. Anomalous gold in the overburden was encountered. Subsequently, R. Komarechka conducted minor exploration intermittently from 1993 to 1996. In 1996, Marum Resources Incorporated and Ditem Exploration Incorporated completed an airborne magnetometer geophysical survey, covering an area of approximately 1800 km^2 over parts of 8 townships. This work was performed in order to identify potential diamond-bearing structures. Based on this program, G. Shouinard and R. Montreuil commenced property acquisition, prospecting, trenching, and lithogeochemical sampling on several promising outcrops.

Regionally, the area is part of the Mesoproterozoic Tomiko Terrain of the Grenville Province. It is underlain predominantly by paragneiss with subordinate orthogneiss. These are intruded by gabbroic rocks, which may have in turn been intruded by granitic rocks (Easton 1992). The Lake Timiskaming Fault System, a bifurcation of the Ottawa-Bonnechere Graben, is located immediately east of the Tomiko Terrain.

The terrain on the Shouinard property is hilly and undulating, yet outcrop exposure is generally less than 5 percent.

The ultramafic unit on the property is a medium-grained peridotite. In hand specimen, the fresh surface is black to green-black. The weathered surface displays a 5-mm thick, brown weathering rind, typical of similar rocks observed in the Grenville Province. In thin section, the rock is composed primarily of olivine with intersertal serpentine. The olivine crystals are subhedral to anhedral. Minor minerals include orthopyroxene, clinopyroxene, and hornblende. Opaque minerals (magnetite) account for approximately 3 percent of the rock. This unit may be classified as a lherzolite.

Another ultramafic unit is a coarse- to medium-grained pyroxenite. This unit lays adjacent to the peridotite. However, no contacts were observed due to overburden. In hand specimen, the fresh surface is black while the weathered surface is brown-black, with minimal weathering. Thin section analysis shows the rock is composed almost entirely of pyroxene with the ratio of orthopyroxene to clinopyroxene approximately 3 to 7. The texture is a mosaic of anhedral grains. Accessory minerals include very fine-grained interstitial opaque minerals. This rock appears to be a websterite. Another phase of the pyroxenite contains minor amounts of serpentinized olivine. Both phases contain accessory pyrrhotite in veinlets and elongated blebs, up to 1.5 cm wide. Selected outcrops of this unit were subject to trenching and lithogeochemical sampling by G. Shouinard and R. Montreuil throughout 1997. Assay results of samples taken by the author for Ni, Cu, and PGM were unavailable at the time of writing.

In the northern section of the claim group, in the vicinity of Ducharme Lake, the composition of the intrusion differs. On the north boundary of claim 1214650 a series of outcrops with rocks composed essentially of plagioclase feldspar and olivine was found. The rock appears medium- to fine-grained, and is black on both fresh and weathered surfaces. The plagioclase is euhedral, prismatic, and oriented. Plagioclase comprises approximately 70 percent of the rock. The olivine is anhedral with a double kelphytic rim, and never in direct contact with the plagioclase. Secondary clinopyroxene and biotite are also present. The rock appears to be a troctolite.

On the western side of the claim group, and along Highway 533, a large area of garnet clinopyroxenite is exposed.

The rock is fine to medium grained, and red-black on both the weathered and fresh surfaces. Major minerals consist of garnet, clinopyroxene (diopside), amphibole (hornblende), quartz, and minor biotite. The garnets are subhedral, fractured, and inclusion-free. It exhibits textural disequilibrium with the clinopyroxene. Nowhere in thin section was the garnet in contact with the clinopyroxene. Rather, the two minerals were always separated by quartz and/or plagioclase. The garnets comprise 30 to 40 percent of the rock. The clinopyroxene is anhedral and displays a symplectic texture with plagioclase. This constitutes approximately 30 percent of the rock. The hornblende is medium grained, anhedral to subhedral, and in places appears to be replacing the clinopyroxene. It comprises approximately 30 percent of the rock. Fine-grained opaque minerals consistently appear as inclusions within the hornblende. This rock may originally have been a basalt which was later metamorphosed to an eclogite. Subsequent retrograde metamorphism accounts for the present mineral assemblage and textures (Davidson, 1990).

The mafic and ultramafic rocks found on the Shouinard property and surrounding area appear to be highly and variable. Although no zones of greater than 2 percent sulphides were encountered on surface, subsurface Ni, Cu, and PGM occurrences may yet be present, given the poor outcrop exposure. It is recommended that the area be geologically mapped in detail, with further geochemical studies.

Recommendations for Exploration

The Sudbury District includes areas of granites and greenstones of the Archean Superior Province, shelf sedimentary and volcanic rocks of the Paleoproterozoic Huronian Supergroup, the enigmatic Mesoproterozoic Sudbury Structure, high grade metamorphic rocks of the Mesoproterozoic Grenville Province and Paleozoic limestones and dolostones on Manitoulin Island, which are part of the northern shelf of the Michigan Basin. This geological diversity, established communities, good infrastructure and a highly skilled workforce make for many attractive exploration opportunities in the district. Parts of the following section have been appended from Meyer et al. (1997) and may have previously been published elsewhere.

ARCHEAN

The district is not well endowed with volcanic–sedimentary belts of Archean age. These make up only about ten percent of the exposed Archean, the remainder being granite. The largest volcanic–sedimentary belt is the Benny belt, which is about 45 km long in an east–trending direction, and up to 5 km wide. It contains one past base metal producer, the Geneva Lake Mine, and one unmined base metal deposit. Oddly, the main elements are zinc and lead, not copper and zinc. This also applies to several base metal occurrences in small inliers of Archean greenstone belts north of the Sudbury Igneous Complex. Iron has been produced from the Moose Mountain Mine north of Capreol, and zinc is known to occur nearby. One Archean inlier in Afton Township has produced small amounts of gold from Archean iron formations.

HURONIAN SUPERGROUP

Uranium–bearing, pyritic quartz pebble conglomerates at Elliot Lake have made the Huronian Supergroup world–famous. In many respects it resembles the Witwatersrand of South Africa, however, only uranium has been found in economic amounts. The gold content in Elliot Lake conglomerates is so low (low ppb range), that no attempts were ever made to recover gold during uranium mining operations. Exposed Huronian Supergroup conglomerates have periodically been explored for gold in all formations and over the entire strike length from Sault Ste. Marie to Cobalt. The results have been disappointing. Even so, the potential for finding gold in pyritic conglomerates in the Huronian Supergroup remains good, but new conceptual models of sedimentology and ore genesis will have to be developed to guide the search for hidden deposits.

Several thick gabbroic anorthosite intrusions occur at the base of the Huron Supergroup. These intrusions have the potential to host magmatic segregation nickel, copper and precious metals deposits along their basal contacts.

Disseminated chalcopyrite, bornite and, chalcocite in arkoses and quartz arenite of the Lorrain Formation in the western margin of the Cobalt Plate continue to attract attention. The mineralization occurs in parts of the Cobalt Plate where the Lorrain Formation is strongly folded and faulted, perhaps into graben structures. Base metal occurrences in arenites are common worldwide, but large and economic deposits are few indeed. The sulphides in the Cobalt Plate are erratically distributed, and their potential has not been fully evaluated. However, due their high silica content, even if low grade and uneconomic as base metal deposits, the rocks may be useful as smelter flux.

Numerous zones of intense albite alteration are found in an area broadly coincident with that part of the Sudbury Structure which lies outside the Sudbury Igneous Complex, and is characterized by intense brecciation thought to be related to a meteorite impact 1850 Ma. The albite alteration affects mostly Huronian Supergroup sedimentary rocks and intrusive Nipissing gabbro. The alteration has been dated at 1700 Ma, and is thus younger than the Sudbury event by about 150 Ma years. The alter-

ation zones are mostly fine grained and pink or tan coloured. They are easily recognized visually. The albite alteration is variably associated with brecciation, sometimes of several ages, and may itself be metasomatically replaced by coarse calcium-magnesium-iron carbonates (often as large rhombohedral phenocrysts or coarse grained massive carbonates), chlorite and sulphides. Anomalous, and somewhat enigmatic, metal concentrations in the albitized rocks may be gold, copper, nickel, cobalt and chromium. Two small deposits in albite alteration zones were mined 10 years ago, one for gold, and the other for gold and copper. These zones of albitization continue to offer challenging exploration targets.

Two Killarney age (1750 Ma) granitic plutons, 75 km apart, the Cutler pluton near Spanish and the Eden Lake pluton east of Lake Panache, intrude folded Huronian rocks. Both plutons have an east-trending elongation and may be connected at shallow depth. Several unusual metamorphic and metasomatic rocks and odd mineral occurrences occur along this line, making it an attractive exploration target, particularly for tungsten, cobalt and gold. For details, see Meyer and Cosec (1996).

Nickel, copper and precious metals sulphide accumulations are common in Nipissing gabbro. Nipissing gabbro intrudes Huronian Supergroup rocks from Sault Ste. Marie to near Kirkland Lake. Yet, for inexplicable reasons, these sulphide and PGM occurrences are limited to an arc around the Sudbury Igneous Complex that is about 30 km wide. The sulphides occur most frequently in small pockets, and may be accompanied by abundant biotite and blue quartz. It is not clear if they are magmatic segregations, hydrothermal accumulations, or related to the local mixing of a mafic magma with quartz rich sedimentary rocks. A systematic investigation of these sulphide occurrences is warranted to see if exploration guides for the discovery of large economic deposits can be developed.

THE SUDBURY STRUCTURE

The Sudbury area is a mature nickel, copper, cobalt and precious metals mining camp, with a production history of over 100 years. Sulphides occur in the Sublayer along the base of the Sudbury Igneous Complex and in offset dikes. The geology is well known and the majority of high mineral potential areas are held by two companies, Inco Limited and Falconbridge Limited.

During the past few years, the two companies have explored deeper and deeper into the footwall of the Sudbury Igneous Complex. This search has been quite successful with economic deposits now being mined to 600 m below the Sublayer contact zone. Footwall ore tends to be high in copper and platinum group metals, and low in nickel. What is not known is how deep into the footwall rocks this mineralization extends, making the footwall beyond the Sublayer contact zone a prime target for exploration.

One enduring mystery of Sudbury geology is the Wanapitei magnetic anomaly and its relationship to the Sudbury Structure. The centre of the anomaly lies about 60 km northeast of Sudbury. Its size, about 60 by 30 km, and oval shape are similar to the size and shape of the magnetic anomaly that accompanies the Sudbury Structure. However, the intensity is several times greater than that of the Sudbury Structure. Due to an extensive cover of Paleoproterozoic Huronian Supergroup sedimentary rocks, the anomaly can not be explained by any rocks exposed at surface. Being so similar in size and shape, and close to the Sudbury Structure, suggests that the anomaly may be caused by a mafic intrusion at depth which may be genetically related to the Sudbury event, and which, similarly, may host rich nickel-copper-precious metals deposits. Despite its depth, the source of the anomaly presents an attractive target.

THE GRENVILLE PROVINCE

South of the Grenville Front Tectonic Deformation Zone, the rocks belong to the Central Gneiss Belt of the Grenville Province. These rocks are high grade metamorphic, and have potential for the discovery of feldspar, garnet, kyanite, graphite, quartzite (as smelter flux), nepheline syenite, flag-

stone, landscaping stone and dimensional stone (granites and gneisses, suitable for the extraction of large blocks and mass production of tiles).

More recently, ultramafic- to mafic intrusive complexes have been discovered in the upper Ottawa Valley. These intrusions, whose, extent has previously been unmapped, deserve added interest.

THE PALEOZOICS OF MANITOULIN ISLAND

Manitoulin Island hosts the potential for the discovery of large tonnage, high grade dolomite deposits and landscaping stones in Ordovician and Silurian rocks. All land on Manitoulin Island is held privately. As such, there is no Crown land available for staking. Property agreements must be made with the landholder.

Table 4. Mineral deposits not being mined in the Sudbury District in 1997.

Abbreviations

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

Deposit Name/NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Geneva Lake Mine (MDIR 41I13SE00002)	Cu, Pb,Zn (Ag, Au)	170,000 T @ 11% Zn. (Small production - 80,588 tons high grade ore)	Natural Resource Holding & Consulting Inc.	Properties with Mineral Inventories, Ontario, Canada, February 1996	Inactive, past-producer 1940s
Spanish River Mine (MDIR 41I05SW00014)	Cu, PGM	Estimate 0.9 million tons @ 0.5% Cu + PGM	D&H Consulting Services Inc.	as above	Inactive, past-producer 1969-70. 14,500 T stockpile on surface
Sudbury Shakespeare (MDIR 41I05SW00076)	Ni, Cu, PGM	Estimate 2.7-3.6 million tons @ 0.34% Ni, 0.40% Cu, + V, Pt, Pd, Re	Falconbridge Limited	as above	Inactive
Stralak Deposit (MDIR 41I13SE00044)	Zn, Cu, Pb (Ag)	800,000 tons @ 4% Zn, 0.3% Cu, 0.5% Pb, 2.0 opT Ag	Stralak Resources Inc.	as above	Inactive, last active 1993, diamond drilling
Falcon Gold (MDIR 41I10SE00003)	Au	Estimate 60,000 tons @ 0.23 oz/Au ton	Pentland Firth Ventures Ltd.	E. Stringer, prospector, PC 1995	Inactive, underground development early 1900's
Fostung (Texas) (MDIR 41I04NE00036)	W, Mo	F33-10 zone, 100,000 tonnes/vertical m @ 0.214% WO_4 with 81,200 tonnes/vertical m @ 0.23% WO_4 and 0.016 % MoS_2	Breakwater Resources Limited	Ginn, R. M. and Beechan, A. W., CIM Bulletin, V. 77, No. 863, p. 60, 1984	Inactive, extensive work by Sulpetro Minerals Limited in late 1970's, early 1980's
Lawson Quarry (MDIR 41I04SE00014)	Si	Significant but unpublished	Inco Limited	n/a	Inactive, Bar River Formation orthoquartzite; past producer of smelter flux
Wikwemikong (MDIR 41H13SE00012)	dolomite	Undetermined but possibly significant	Wikwemikong Unceded Indian Reserve	n/a	Inactive, some widely spaced diamond drill holes. Feasibility and several reports completed

Table 4. cont'd. Mineral deposits not being mined in the Sudbury District in 1997.

Deposit Name/NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Kidd Copper (MDIR 41I06NW00012)	Ni, Cu, Co, PGM	Estimated 498,000 tons averaging 0.71% Cu, 0.62% Ni in Robinson Zone (No. 1 Shaft area); 275,000 tons @ similar grade in the Rosen Zone (No. 2 Shaft area)	J. P. Sheridan	Canadian Mines Handbook, 1969-70	Inactive, past producer, 1966 to 1968
Parkin Calcite (MDIR 41I15SW00041)	$CaCO_3$	147,460 probable and possible tons of "good, fair and poor" calcite	J. Brady	AF Parkin SP025	Inactive
Graphite Lake Mine (MDIR 31E11NE00004)	graphite	Sheehan zone remains unmined, 6.4 million tons proven @ 2% graphitic carbon (part of 30 million tons, p, p, & p)	Applied Carbon Technology Inc.	OFR 5892	Inactive, past producer, closed in 1994 (possibly '93)
Errington/Vermilion Mines (MDIR 41I11SW00006)	Zn, Cu, Pb	4.4 million tons @ 1.33% Cu, 1% Pb, 4% Zn; 9 million tons @ 1.14% Cu, 1% Pb, 3.8% Zn (more recent diamond drilling by Falconbridge Limited has increased these figures)	Falconbridge Limited, Royal Oak Mines Inc.	MRC 12	Inactive, past producer
Cummings Lake Prospect (MDIR 41I16NE00036)	Fe	327.9 million tons @ 26.9% soluable Fe total	Ownership unknown	MRC 11	Inactive, underground exploration and bulk sampling
Burwash Lake Prospect (MDIR 41P02SW00006)	Fe	15 possible pit areas outlined containing indicated or inferred reserves of 450,000 tons per vert. foot, aver. 20.7 % Fe. Potential tonnage est. @ 100 million tons. Preliminary concentration tests - concentrate grading 68.2% Fe, 5.0% SiO_2 with recovery of 93%	Ownership unknown	MRC 11	Inactive
Brazeau Prospect (MDIR 31L02NE0010)	Va, Ti, Fe, (garnet)	110 000 T @ 0.76% V_2O_5, 7.9% TiO_2, 35.2% Fe for two lenses to 100 ft.; 950 000 T for 6 lenses to 100 ft.	A. H. Clark	MRC 11	Active, presently (1997-98) being evaluated
Belanger Bay (MDIR unassigned)	dolomite	Significant but unpublished	Donohue Incorporated	n/a	Inactive; area zoned for extraction
Angus deposit (MDIR 31L14SW00014)	Ti, Fe	141 000 000 T @ 34.58% Fe, 15.64% TiO_2 to 1000 feet depth	Titan Iron Mine Ltd.	AF Angus Tp.	Inactive patents
Bissett Creek deposit (MDIR 31L01SE00002)	flake graphite	26 038 000 T @ 1.86% flake graphite; 4 744 000 T @ 2.99% graphite	North Coast Industries Ltd.	AF Maria Tp.	Active staked claims
Butler (Crocan Lake) prospect (MDIR 31L11SE00012)	kyanite	50 000 000 T @ 13-17% kyanite	Kyanite Mining Corp.	AF Butler Tp.	Active leases
Butler Vermiculite deposit (MDIR 31L11SE00003)	vermiculite	"A" zone: 144 000 T @ 50-90% vermiculite	Richland Mines Inc.	company press release, July 1997	Active

OGS Activities and Research by Others

The Sudbury Structure continues to be a popular focal point for research.

A.P. Dickin, McMaster University, is completing an isotopic and geochemical study of parts of the Sudbury Igneous Complex (SIC).

D. Watkinson, Carleton University, is continuing his research into the alteration and mineralization associated with the footwall ore deposits of the Sudbury Structure. In a related project, F. Molnar, Eotvos Lorand University in Budapest, is examining fluid inclusion characteristics of the footwall ore deposits from the South Range of the Sudbury Structure.

A number of theses at Laurentian University are focussed on the Sudbury Structure. C. Gauld, is currently completing a masters thesis dealing with the distribution and chemistry of sulphide mineralogy on the Inco Limited WD 16 property. M. Reich, also a masters student, is examining the chemistry and relationship to mineralization of phyllosilicates at the Whistle Mine. M. Moore is completing her master's thesis on ultramafic rocks which are exposed in the Fraser and Levack West mines located on the North Range. The thesis will focus on the geochemistry and geochronology of the ultramafics (which lie within Levack gneiss), and how they relate to the Sudbury Igneous Complex. K. McCormick is completing a post-doctoral study of rock fragments and shock features in breccias at the Fraser mine.

The University of New Brunswick Sudbury Research Program is comprised of a team of four students and one supervisor. The aim of the program is to study the radial and concentric offset dikes of the Sudbury Structure (Spray et al., 1997). Three concentric offsets are currently being studied in detail: C.R. Wood is studying the Hess Offset in the North Range; R.G. Scott is examining the Frood-Stobie Offset in the South Range; and J.P. O'Connor is studying the Manchester Offset, also in the South Range. Spray et al. (1997) have indicated that detailed mapping of the Hess Offset has resulted in it being extended approximately 8 km west of its previously determined limit by Card and Innes (1981). Additional work will commence in 1998 on the Whistle-Parkin radial Offset. As well, H.M. Gibson is nearing completion of her study on shatter cones (mainly in the South Range).

S.Prevec, Q. Xie, and R.R. Keays (Laurentian University) are continuing to work with P. C. Lightfoot and others from Inco Limited utilizing radiogenic isotopic and PGM geochemistry to investigate the origins of the SIC Sublayer and its relationship to the SIC Main Mass and to pre-existing basement rocks.

In conjuction with the Large Meteorite Impacts and Planetary Evolution Conference in September, P.C. Lightfoot, A.J Naldrett, and G. Morrison completed OGS Open File Report 5950, Sublayer and Offset Dikes of the Sudbury Igneous Complex-an Introduction and Field Guide.

There are also several research projects on rocks belonging to the Southern Province. L.S. Jobin-Bevans is currently working on a doctoral thesis at the University of Western Ontario under the supervision of R.R. Keays, and N.D. MacRae. The thesis will examine the potential for economic concentrations of Cu-Ni-PGM hosted in Nipissing gabbro. Geological mapping, as well as lithogeochemical sampling of specific Cu-Ni-PGM occurrences will be completed. One of the aims of this study is to develop a useful exploration model for gabbroic ores that may be used by prospectors, as well as junior exploration companies.

Z. Magyarosi, Carleton University, is currently completing a masters thesis under the supervision of G. Skippen on metamorphism at selected localities in the Southern Province and Sudbury Structure.

M. Easton, S. Buckley and F. Ford presented a poster at the GAC/MAC Conference in Ottawa in May on the chemistry and significance of scapolite in some layers in the Espanola Formation. The

goal of the study was to determine whether the scapolite-bearing layers represented halite-rich sediments, or whether they were formed from NaCl rich brines related to Nipissing gabbro intrusions. Samples were taken from near the infamous "clastic dyke locality", south of Espanola. Easton et al. (1997) argued in favour of an evaporitic origin for the scapolite-bearing layers.

Research is also targeting the Grenville Province, where a number of projects are being completed. E. Murphy, Laurentian University, is completing a masters thesis on the structure and metamorphism of rocks across the Grenville Front in the northeastern part of Street Township, east of Sudbury. In a related study, S. Buckley, M. Easton, F. Ford, and E. Murphy presented a poster at the GAC/MAC Conference in Ottawa (in May) dealing with P-T Conditions on the Grenville Front, also in Street Township. L. Hubbard, Laurentian University, is completing her Bachelor's thesis on the nature of the unusual ultramafic dykes observed in the Grenville Province in Street and nearby townships.

Mike Easton, Ontario Geological Survey, presented several posters (at the GAC/MAC in Ottawa) which examined the geochemistry of amphibolites and paragneisses located in the Grenville Front Tectonic Zone between Sudbury and Crerar. The aim of the study was to use geochemistry to determine if these rocks are the high-grade metamorphic equivalents of Huronian Supergroup and Nipissing suite rocks.

F. Schrader, University of Toronto, is continuing his research into oriented large garnets along the Grenville Front to determine mineral rotation during thrust movement.

A. Davidson, Geological Survey of Canada, is continuing his research and mapping along the Grenville Front. In May, he led an informative field trip to selected localities along the Front as part of the Institute on Lake Superior Geology conference in Sudbury. He has most recently published a paper in the Canadian Mineralogist with K. Bethune (Queen's University). The paper details a study of the tectonic significance of the Sudbury diabase dikes in the Tyson Lake area (southwest of Sudbury) and how this relates to the evolution of the Grenville Front. Much of the work summarizes K. Bethune's PhD thesis, completed in 1993.

An aggregate resources assessment of the eastern part of the Regional Municipality of Sudbury was undertaken by the Sedimentary Geosciences Section of the Ontario Geological Survey. The main goal of the study, outlined by Rowell (1997) is to "delineate the aggregate deposits within the study area and to assess the quality and quantity of the sand and gravel resources". Preliminary results from Rowell (1997) suggest that the area has several potential sources of aggregate, including gabbroic and granitic rocks, as well as nickel slag. Furthermore, sand and gravel from glaciofluvial ice-contact features, as well as outwash and deltaic deposits in the Sudbury region (such as in the area around the Sudbury airport) also comprise potential supplies of aggregate.

Table 5. Publications received by the Sudbury District Office in 1997.

Title	Author	Type and Year of Publication
Sublayer and Offset Dikes of the Sudbury Igneous Complex- an Introduction and Field Guide	Lightfoot, P.C., Naldrett, A.J., and Morrison, G.	Ontario Geological Survey, Open File Report 5965, 37p., 1997
Geochemistry of the Main Mass, Sublayer, Offset, and Inclusions from the Sudbury Igneous Complex, Ontario	Lightfoot, P.C., Doherty, W., Farrell, K., Keays, R.R., Moore, M., and Pekeski, D.	Ontario Geological Survey, Open File Report 5959, 231p., 1997
Prospector's Guide to Drift Prospecting for Diamonds, northern Ontario	Morris, T.F., and Kaszycki, C.A.	Ontario Geological Survey, Miscellaneous Paper 167, 63p., 1997
Canadian Mines Handbook, 1997-98	Giancola, D.	Southam Mining Publications Group, 1997
Chilean Mining Legislation	Chilean Mining Ministry and Foreign Investment Review Board	Ministerio De Mineria De Chile, 1996
Atlas of Alteration	Thompson, A.J.B., and Thompson, J.F.H., editors, (Dunne, K.P.E., MDD Series Editor)	Geological Association of Canada, 1996
Securities Law Reporting Requirements for Ore Reserves	W.S. Vaughan and Michael J. Bourassa, Chairmen	Prospectors and Developers Association of Canada Short Course, 1997
In addition, the office receives copies of *The Sudbury Star, The Globe and Mail, Canadian Mining Journal, CIM Bulletin, The Northern Miner, Nickel, Economic Geology, and the Society of Economic Geologists Newsletter.*		

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Scalia, P.R., 1993. Coniston North 1992 exploration program, Clifton Associate Limited; Sudbury Resident Geologist's office, Dryden Township, assessment file Dryden SP001, 29p. with accompanying maps.

Spray, J. G., Gibson, H. M., O'Connor, J. P., Scott, R. G., and Wood, C. R., 1997. Geological setting of offset dikes and allied hypervelocity impact studies within the Sudbury Structure--UNB Sudbury research program, *in* Summary of Field Work and Other Activities, Ontario Geological Survey, Miscellaneous Paper 168, p.89-92.

Metric Conversion Table

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

OTHER USEFUL CONVERSION FACTORS

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

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

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