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Mineral Resources and Mining Properties
in the
Kirkland Lake-Larder Lake Area

By

W. S. SAVAGE

Mineral Resources Circular No. 3

TORONTO

Printed and Published by Frank Fogg, Printer to the Queen's Most Excellent Majesty

1964

Publications of the Ontario Department of Mines are obtainable through the
Publications Office, Department of Mines, Parliament Buildings,
Queen's Park, Toronto 5, Ontario, Canada

Mineral Resources Circular No. 3, paper-bound only: \$1.00

Orders for publications should be accompanied by cheque, money order, or postal note, payable in
Canadian funds to Provincial Treasurer, Ontario. Stamps are not acceptable.

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GEOLOGICAL CHART

Chart A — Mineral resources and mining properties, Kirkland Lake -
Larder Lake area, Scale, 1 inch to 2 miles.

**MINERAL RESOURCES AND MINING PROPERTIES
IN THE
KIRKLAND LAKE – LARDER LAKE MINING AREA**

BY

W. S. SAVAGE¹

INTRODUCTION

The Kirkland Lake–Larder Lake mining area is a section of the great gold-producing belt that extends for more than 150 miles from Kirkland Lake, eastward to Larder Lake, and across northwestern Quebec to and beyond the Malartic–Cadillac area. The town of Kirkland Lake, which is the largest community in the area, is situated in Teck township at latitude 48° 09' north and longitude 80° 03' west. It is the business centre of the area and is well-connected by highway and railway with other parts of Ontario and Quebec. The township of Teck has a population of about 16,000, most of whom are directly or indirectly dependent upon the gold-mining industry for their living.

On any map outlining the geology of northeastern Ontario, a long and comparatively narrow belt of rocks of Timiskaming age can be seen extending from Kenogami Lake in Grenfell township, eastward through Teck, Lebel, Gauthier, McVittie, and McGarry townships, to the Interprovincial (Ontario–Quebec) boundary. The area under consideration in this report consists of these 6 townships and the contiguous 6 townships south, namely: Eby, Otto, Boston, McElroy, Hearst, and McFadden.

History

The Larder Lake area was the scene of the first gold rush in the northeastern part of Ontario. The discovery of rich silver ores at Cobalt in 1903 stimulated widespread prospecting that extended farther and farther afield until, in August 1906, a

¹Resident Geologist, Ontario Department of Mines, Kirkland Lake.

gold discovery was made on ground now owned by Kerr-Addison Gold Mines near the northeast arm of Larder Lake. News of the find caused a stampede of prospectors into the area during the late autumn and winter of that year, and a large part of the country was indiscriminately staked. Development work on this ground during the following summer failed to uncover any important gold showings. The resulting disappointment of prospectors and investors gave the camp a serious setback for many years. It was not until 1936, when the Omega mine commenced milling operations and a large tonnage of ore was found at the Kerr-Addison mine, that Larder Lake began to become an important camp.

At the time of the gold rush into Larder Lake in 1906, many claims were staked for gold around Swastika and northeast to the lake which became known as Kirkland Lake, but most of them were allowed to revert to the Crown. Gold was first discovered at Kirkland Lake by W. H. Wright in 1911, on what is now the east claim of the Wright-Hargreaves mine. The following year, gold was found on the Tough-Oakes claims and shipments of high-grade ore from that property (later the Toburn mine) in 1913, started a great prospecting rush, following which the mines of the camp were gradually developed. Production began at Teck-Hughes mine in 1917, at the Lake Shore mine in 1918, at the Kirkland Lake Gold mine in 1919, at the Wright-Hargreaves mine in 1921, at the Sylvania mine in 1927, and at Macassa mine in 1933.

The records show that most of the mines at Kirkland Lake encountered considerable discouragement in the early stages of development,

and it was only through the courage, tenacity, and hard work of the pioneer developers that success was finally achieved.

The 7 gold mines in the Kirkland Lake camp are on contiguous properties extending over a length of about $3\frac{1}{2}$ miles along the main ore zone, which passes through the town of Kirkland Lake. From west to east the mines are Macassa, Kirkland Minerals, Teck-Hughes, Lake Shore, Wright-Hargreaves, Sylvanite, and Toburn. Only 4 of these mines were still in operation at the end of 1961. All of the mines are located on a continuous gold-bearing structure, a strong fault that is commonly referred to as the Kirkland Lake "Main break". The productive portion of this ore zone lies largely in the eastern part of Teck township, but extends a short distance into Lebel township.

Production

Kirkland Lake ranks as the second largest gold-producing camp in the Province of Ontario and in Canada, being second only to the Porcupine camp in the total amount of gold produced. Some of the mines at Kirkland Lake have been in continuous operation for about 50 years. Most of the mines have been opened to great depth and, at present, the camp holds the record for the deepest underground development on the North American continent. To the end of 1962, the 7 mines mentioned above had milled 47,849,594 tons of ore and produced 21,507,928 ounces of gold and 4,009,754 ounces of silver, valued at \$680,962,150. From 1915 to 1962, inclusive, the total dividends paid amounted to \$241,137,100. (Figures supplied by statistician, Ontario Dept. of Mines.)

The production of such mineral wealth made Kirkland Lake one of the most flourishing communities in Ontario during the decade immediately preceding World War II. Throughout the war years, however, operations were greatly hampered by the shortage of labour. Since the end of the war, mounting costs have overtaken and in most cases wiped out the operating profit. Toburn closed down in 1953, followed by Kirkland Minerals in 1960, and Sylvanite in 1961. Macassa is the only one of the 4 mines still operating that made a profit in 1961. Teck-Hughes, Lake Shore, and Wright-Hargreaves were able to continue operations only because the Canadian Government subsidized them through the Emergency Gold Mining Assistance Act of 1948.

In 1961, in a move to offset declining employment and production in the mines of the area, briefs requesting assistance were submitted by the

municipal authorities and the mine managers at Kirkland Lake to the Ontario Department of Mines. Negotiations resulted in arrangements being made for the Kirkland Lake mines, the Canada Department of Mines and Technical Surveys, and the Ontario Department of Mines to participate in a comprehensive program with the ultimate objective of finding new ore bodies within the general area. Preparation of this Inventory of Mineral Resources is one of several projects that are being undertaken in this connection by the Geological Branch of the Ontario Department of Mines.

Sources of Information, and Acknowledgments

A report of this nature must, by definition, consist mostly of information obtained from outside sources. Some descriptions listed are of properties personally examined by the writer, but much the greater part of the information has been compiled from government reports, technical publications, and the records in the files of the Resident Geologist at Kirkland Lake obtained from mining companies, property owners, and individuals.

Descriptions of mineral occurrences in the Kirkland Lake-Larder Lake area have been made by geologists and engineers at intervals dating back to the first prospecting activity north of Lake Timiskaming. A bibliography listing a wide selection of references is at the end of this report.

The writer wishes to acknowledge with appreciation the information obtained from the above-mentioned sources for this Inventory. He is particularly indebted to the geologists of the Ontario Department of Mines who, since 1936, have taken part in a detailed investigation of the entire Kirkland Lake-Larder Lake gold belt. Their reports have provided the information that is summarized under the title of General Geology and Structure, as well as a wealth of detail used in describing the mining properties of the area.

General Geology and Structure

Experience gained from widespread exploration throughout the Kirkland Lake-Larder Lake gold belt has shown that ore bodies have a closer relationship to structures than to rock types. The main ore zone of the Kirkland Lake camp is an outstanding example of the close association between ore and a fault system. In the early days,

the syenite and syenite porphyry were regarded as the favourable host rocks for ore, and the so-called "lamprophyre" was believed to be unfavourable. In recent years, excellent ore has been found in the once-despised "lamprophyre" (augite syenite). In fact, ore is now found in all rock types of the camp with the exception of a few late

era and consist of volcanics, sediments, and intrusives. In Grenfell township to the west, and in McGarry township to the east, relatively flat-lying sediments of the later Cobalt Series (Huronian) cover the older folded formations with great unconformity. The deposits of sand, gravel, and clay, which form a thin mantle over the bedrock

TABLE OF FORMATIONS

QUATERNARY

PLEISTOCENE Clay, sand, gravel.

PRECAMBRIAN

HURONIAN (COBALT SERIES) Conglomerate; arkose, greywacke, slate.

Great Unconformity

POST-ALGOMAN Diabase, lamprophyre.

Intrusive Contact

ALGOMAN Syenite porphyry, quartz-feldspar porphyry, alaskite.
Quartz porphyry.
Basic syenite, augite syenite, and lamprophyre; augite porphyrite.
Hornblendite, biotite, diorite.
Granite and syenite.
Carbonate rock or "dolomite".
Diorite and gabbro; quartz diorite and quartz gabbro.

Intrusive Contact

TIMISKAMING Trachyte; trachytic breccia.
Tuff and agglomerate; tuffaceous conglomerate.
Conglomerate, greywacke, basal grit.

Great Unconformity

KEEWATIN

Tuff, and iron formation.
Altered basic volcanics.
Intermediate and basic volcanics (greenstone).

diabase dikes, and the operators are willing to explore any promising pre-ore structure regardless of the nature of the country rock.

ROCK FORMATIONS

The bedrocks of the Kirkland-Larder mining area are Precambrian in age; the formations of economic interest belong to the earlier Precambrian

in depressions, were laid down during the continental glaciation of Pleistocene time.

The rock formations with their different members may be classified as in the following Table of Formations, the oldest being placed at the bottom of the list. This table, and the text under the headings *Keewatin-Timiskaming Unconformity*, *Larder Lake "break"*, *Algoman Intrusives*, *Structural Control of Ore Deposition and Post-ore*

Faulting, and Ore Occurrences, are excerpted from the Guide Book for Field Trip No. 8 of the G.S.A.-G.S.C. in November 1953.

KEEWATIN-TIMISKAMING UNCONFORMITY

The oldest rocks exposed in the Kirkland Lake area are the Keewatin series, a group of volcanic rocks that is widespread and practically devoid of sedimentary members. Long and relatively narrow bands of diorite and gabbro are associated with the lava flows. Some of these are probably intrusive sills; other narrow bands may be only the coarse-grained portions of thick flows. Overlying the Keewatin lavas with great unconformity is the Kirkland Lake belt of predominantly sedimentary rocks. This sedimentary-volcanic group, generally known as the Timiskaming series, occurs in a long and relatively narrow belt. Conglomerate, greywacke, tuff, and trachyte are the most widespread rock types in this series.

Before the deposition of the Timiskaming series, the Keewatin lavas were subjected to pressure in a north-south direction, which resulted in intensive folding. This folding was followed by a long period of erosion. On the erosion surface the sediments, tuffs, and trachytes were laid down. Further pressure downfolded the Timiskaming series into a synclinal structure. Continuing pressure, which could obtain no further relief by folding, caused the rocks to fracture and produced a great overthrust fault dipping steeply to the south, which is known in the area as the Larder Lake "break".

LARDER LAKE "BREAK"

The Larder Lake "break" is the outstanding faulted zone in the area and is now considered to be the westerly extension of the Malartic-Cadillac fault, giving it a known length of more than 100 miles across northwestern Quebec and the Larder Lake and Kirkland Lakes areas. It is a strong wide carbonatized shear zone, characterized by the presence of green mica and quartz stockworks.

This "break" may be regarded as the most important structural feature of the Larder Lake camp, for it or its branches appear to have had some influence on the localization of most of the ore bodies. It has been traced at intervals on surface from a point beyond the Chesterville mine westward across McGarry and McVittie townships and part of Gauthier. In the western half of Gauthier township it is heavily drift covered, and in the south-central part of Lebel township later syenitic intrusives appear to have cut out most of the structure. The Larder Lake "break" is exposed

again in Teck township about a mile to the south of the Kirkland Lake fault on which the producing mines are located. From the southern part of Teck township it has been traced southwestward to where it is overlain by the later Cobalt series in Eby township.

The amount of displacement along the Larder Lake "break" is not known. It cannot even be definitely stated whether the displacement is measurable in hundreds of feet or in miles. Nevertheless, the length of the fault zone, combined with the alteration along it and the deformation of adjoining formations, strongly suggests that the total displacement has been very great. There is evidence to show that the south side moved upward and eastward with respect to the north side.

ALGOMAN INTRUSIVES

The rocks of both the Keewatin and Timiskaming series were then invaded by Algonian intrusives, which occur in the form of stocks, dikes, and irregular-shaped bodies ranging in composition from granite to diorite or lamprophyre. The syenite intrusive, which occupies most of the southern half of Lebel township and cuts out the Larder Lake "break" in that vicinity, has already been mentioned.

In Teck township the most important of the intrusives are the syenite, augite syenite, and syenite porphyry, the longer axes of which roughly parallel the strike of the sediments. The syenite (A2)¹ is in the form of an irregular pipelike body 1,600 by 900 feet at surface, where it is seen at the Teck-Hughes, and plunges westward at 43° through the Kirkland Lake Gold on to the Macassa. The augite syenite (A5)¹ at surface extends westward from the centre of the Lake Shore into the Macassa and the syenite porphyry (A9)¹ extends at surface from the centre of the Lake Shore eastward through the Wright-Hargreaves and Sylvanite on to the Toburn. Both the augite syenite and syenite porphyry stocks are characterized by a steep dip on the north side with a flatter dip at the south contact, so that the widths of these stocks increase with depth. Each has a general westerly plunge.

STRUCTURAL CONTROL OF ORE DEPOSITION AND POST-ORE FAULTING

Following the emplacement of the intrusives, hot circulating solutions produced carbonate replacements along pre-existing faulted zones, of

¹See O.D.M. map No. 1945-1.

which the Larder Lake break is the most important. This carbonatization was followed by the faulting which opened up channelways for the later solutions that produced the gold-bearing veins in the Kirkland Lake camp. The principal vein structure, known as the "Main break" or Kirkland Lake fault, is a thrust fault of some magnitude, striking N.67°E. with a steep southerly dip. The south side has moved up. Further movement took place on the Larder Lake "break" at this time, and it is possible that the Kirkland Lake fault branches away from the Larder Lake "break" in the vicinity of Kenogami Lake.

The "Main break" or Kirkland Lake fault passes through all the 7 producing mines and has been identified to a depth of 7,000 feet. It has cut through the Timiskaming sediments and the various intrusive rocks, and geological sections enable the formations on either side of the fault to be matched, thus giving the amount of movement that has taken place. The south side moved up almost vertically for 1,400 feet relative to the north side.

The fault is represented in some places by a single plane, in others by 2 or 3 planes spaced within a few feet or by fault planes, forming bows in the structure, which may be separated over distances of several hundred feet. Where more than one plane is present the ground between the faults is fractured by cross-over faults, and regions where these are plentiful provide the widest ore bodies.

Two important faults, on which the North and South veins occur, branch off the "Main break" in the centre of the camp. These faults are also thrust faults with the south side moved up relative to the north side. The South vein fault branches off on the hanging-wall side at the Wright-Hargreaves and is traced westward through the Lake Shore, Teck-Hughes, Kirkland Lake Gold, and probably as far as Macassa. The North fault branches off on the footwall side of the "Main break" at the Lake Shore and is traced eastward through the Wright-Hargreaves and Sylvanite to the Toburn, where it is seen to die out. Other minor faults in this series branch off the "Main break" and have been important sources of ore.

Besides the thrust-fault vein structures just described, veins are found on numerous subsidiary structures. Some on the minor faults formed coincidentally with the larger ones and others on tension fractures that were formed during release of the compressive forces. The tension fractures may parallel the major faults or may angle between these structures with dips varying from vertical to flat. Favourable locations for tension fractures are

in the wedge-shaped blocks between the main faults.

The veins in which the ore deposits are found are associated with the structures just described. It is due to the fact that this 3-dimensional latticework of thrust faults, cross-over faults, and tension fractures was formed in the east half of Teck township following the emplacement of the intrusives that Kirkland Lake owes its gold mines.

An apparent feature of the structure of the ore zone is the transfer of subsidiary veins from one side of the "Main break" to the other in the east and west halves of the camp. One theory suggests that torsional strains across the camp may be responsible for this transfer of vein fractures from the hanging-wall to the footwall of the main plane of movement, going eastward. On the other hand, if the vein-fracture pattern at the east end of the camp is considered to be related to a branching-fault system rather than to a single fault plane, the entire picture is changed and any transfer of subsidiary veins to a footwall is not noticeable. The vein-fracture pattern of the north vein and its flatter southern subsidiaries in the east end of the camp is generally similar to that of the "Main break" and the southern subsidiaries at the west end of the camp. It is also a fact that ore shoots are more concentrated along the North vein zone than the main line of displacement in the Wright-Hargreaves, Sylvanite, and Toburn mines. There is no appreciable change in the dip of the main shear plane at either end of the Kirkland Lake camp, as would be expected if there had been torsional movements.

If no further rock movements had taken place, outlining and mining the Kirkland Lake ore bodies would have been a very straightforward proposition, but following the introduction of the gold-bearing veins, faulting again took place. The earliest post-ore faulting appears to be the horizontal movements that are evidenced by the offsetting of later diabase dikes on the "Main break" and South vein fault. The later faults are mainly distributed in the eastern half of the ore zone. At the Lake Shore and the mines to the east, post-ore strike faults, both northward- and southward-dipping, and major and minor transverse faults are recognized.

The Lake Shore post-ore fault is the largest transverse fault and has been traced from surface to the deepest workings. This fault dips steeply to the southeast. The east side moved down and north relative to the west side. The horizontal component of the movement is about 650 feet, and the vertical component is more than 300 feet.

The displacements occurring in the ore bodies

as a result of these later movements necessitate very close co-operation between the geological and production departments in all of the Kirkland Lake mines. The mining engineer, who in the past was inclined to scoff at the geologist as a visionary, is having demonstrated to him every day the practical value of geological interpretation.

The foregoing description has outlined in a general way the structural control that influenced the deposition of the Kirkland Lake ore bodies and the displacements brought about by post-ore faulting. The mines elsewhere along the belt owe their existence to structural deformation of the same periods followed by economic mineralization coincidental in time with the vein formation at Kirkland Lake.

The faults at the Bidgood and Upper Canada tend to converge with the Larder Lake "break" and could be subsidiary branches of this structure formed during the later period of deformation that produced the Kirkland Lake fault.

The Amikougami Creek, Sylvanite, Long Lake, and Misema River faults probably belong to the same period of post-ore transverse faulting as the Lake Shore fault.

The main ore bodies in the Larder Lake camp appear to be associated structurally with the periods of deformation that followed the carbonatization of the Larder Lake "break". Only a fraction of the ore bodies lies within the original zone of intense shearing. The remainder lies in adjacent hard competent rocks, which failed under tension during different periods of movement along or near this line of weakness. It is thus important to note that, unless there is some evidence of post-carbonate deformation, the fracturing tends to be weak and the gold content is low. Another important structural control over the localization of ore bodies is the presence of folds or gentle bends in the adjacent strata. In the Kerr-Addison and Chesterville ore zone, which is a single geological unit, the ore bodies on the south side appear to be localized in part within a pitching anticlinal fold, although the structure is badly broken up by faults. In places the ore zone at the Omega mine showed a gentle swing in strike, and the ore bodies lay near the apex of the arching.

No genetic relationship has been established between the gold deposits of the Larder Lake area and any particular type of intrusive. Gold occurs in a variety of rock types at different properties, and even within the limits of one mine's workings. Ore bodies are found in: (1) carbonate rock (dolomite), (2) basaltic lava, (3) dacitic lava, (4) syenite dikes and stocks, (5) tuffs, and (6) talc-chlorite schist with interfingering dikes. It will thus be

apparent that structural deformation with accompanying rock alteration is of prime importance in the search for new ore bodies and that the rock types present are of secondary importance.

In the Kirkland-Larder mining area the exceedingly rough topography produced during the various periods of faulting just described has been eroded during the passage of hundreds of millions of years by weathering and glaciation to the relatively level surface that exists today. The south half of the syncline of Timiskaming sediments, which was moved up when the Larder Lake "break" occurred, is almost completely gone. The sediments exposed in McElroy, McVittie, and Hearst townships, south of the Larder Lake "break", are shallow remnants of the bottom of the syncline, and another small remnant can be seen in the northeast corner of Eby township.

ORE OCCURRENCES

In the Kirkland Lake camp, fissure veins are the commonest type and are responsible for the larger ore bodies on the various faults. Other structures are representative of stockworks, breccia, and gash veins. Quartz is the principal gangue mineral, though its proportion in the ores milled is relatively small. Some calcite is usually associated with the quartz. Other minerals in small amounts are albite, orthoclase, ankerite, barite, tourmaline, actinolite, and apatite. Secondary minerals are represented by sericite, carbonates, chlorite, and pyrite.

Gold, last to be deposited, is found native in the gangue and in fractures in the wall rocks and earlier-formed vein minerals, and is present in calaverite (AuTe_2) and petzite, $(\text{AgAu})_2\text{Te}$. It is also associated with fine pyrite, which mineral constitutes about 2 percent of the ore by weight. Silver is associated with the gold and is also present in the petzite. Other minerals in the ores are chalcopyrite, hematite, galena, sphalerite, molybdenite, graphite, and the tellurides altaite (PbTe), coloradoite (HgTe), and melonite (Ni_2Te_3).

The longest stoping length of ore is at the 3,000-foot horizon, where a length of 6,400 feet of ore was shared by the Teck-Hughes, Lake Shore, and Wright-Hargreaves. Of this, 2,600 feet lies on the "Main break" and the remainder on the North vein fault.

The gold deposits in the Larder Lake camp occur as fissure or composite quartz veins, quartz stockwork deposits in the carbonate zone, quartz-sulphide deposits in lavas and tuffs, sulphide bodies without much quartz, and in talc-chlorite schists and mineralized dikes.

Explanation of Descriptive Notes on Properties

LISTING

Properties are divided into groups according to the chief metal present or sought. Within each group the properties are listed alphabetically under the name by which they are best known in the area. If the claims that constitute the property have not been brought to patent, the mining recorder can provide the name of the present owner. A fee of 25¢ is charged for the search. On the other hand, if the property is patented ground, present registered ownership will have to be ascertained from the local Master of Titles at Haileybury. There is a general index of mining companies, mines, and properties at the back of the report (pp. 103-108).

LOCATION

The claim numbers that constitute the group or property are in most cases listed, and the main showing is located by the number of the claim on which it occurs. For most large properties, the location of important showings or mine shafts can be obtained by consulting the references listed. Many of the properties described in this Inventory are located on the Ontario Mineral Map No. 2024, and on the Timmins-Kirkland Lake Compilation Map No. 2046, both published by the Ontario Department of Mines.

Chart A (*back pocket*), used in conjunction with the Map List beginning on p. 97, will enable the reader to quickly locate any property of interest to him.

HISTORY AND DEVELOPMENT

In the early days of mining in this area, numerous small developments were undertaken of which only scanty records now exist, but every effort has been made to collect and record any available information.

SAMPLING RESULTS, ORE-RESERVES DIMENSIONS, GRADE, PRODUCTION

Wherever possible the authority for a statistical statement is given with the date it was made.

REFERENCES

If a description of the property in question has been given in an O.D.M. annual report, the report is listed as a reference. Such reports usually contain a list of earlier reports on the property. More recent supplementary information may often be found in such publications as the Northern Miner, the Canadian Mines Handbook, the Financial Post's Survey of Mines, and others.

Reports to which the public may refer in the office of the O.D.M. Resident Geologist at Kirkland Lake are filed in alphabetical order under the name of the property. The name of the author and the date when the report was written are included in the reference.

DESCRIPTION OF MINES AND PROPERTIES

Precious Metals (Gold Alloyed With Minor Silver)

ALSCHBACH GOLD MINING CO. LTD.

- Location** The property consists of a group of 11 patented claims in the east-central part of Grenfell township northwest of Goldthorpe on the O.N.R. The claim numbers are: L.4125, L.6369, L.7423, L.7424, L.7585, L.8037, L.11779, L.13909, L.13910, L.14811, L.14993.
- Chief Metal Present** Gold.
- History and Development** Alschbach Gold Mining Co. Ltd. was incorporated in 1922. A shaft was started in 1928, and when the mine closed in 1929 it had reached a depth of 150 feet with 200 feet of lateral work on the 125-foot level. In 1933, Hudson Bay Gold Mines Ltd. optioned the property for a few months and did more drifting on the 125-foot level. Underground operations were resumed early in 1934; by the time they were discontinued in November, the shaft had been deepened, and the lateral work amounted to 875 feet on the 125-foot level and 40 feet on the 250-foot level. The mine was de-watered and re-examined in the fall of 1936. The company was reorganized in 1937 and became Alschbach Kirkland Gold Mines Ltd. In 1944 this name was changed to Mylake Mines Ltd., and about 9,000 feet of surface diamond-drilling was done in 1945. The underground workings were pumped out again and sampled in 1958.
- Geology** Volcanic rocks of Keewatin age underlie the property. They consist of inter-banded pillow lavas, massive coarse basalt flows, and occasional narrow bands of agglomerate. The flows face north except where folded and have a general trend of N60°W. The volcanics are cut by a narrow syenite porphyry dike striking east-west on claim L.11779, and by a number of later north-south-trending diabase dikes.
- Surface work was done on 12 quartz veins erratically mineralized with fine pyrite. The shaft was sunk on the No. 3 vein in an outcrop close to the centre of claim L.4125 where there was a concentration of these veins. The No. 3 vein was vertical and showed gold values to a depth of 63 feet where it flattened and dipped into the south wall of the shaft. At 65 feet a parallel vein dipping 40° to the north was exposed. The best values were obtained at and above the junction of these 2 veins. The strike of the veins in general conforms to that of the lava flows.
- Sampling Results** G. L. Holbrooke, reporting on the 1945 surface diamond-drilling, stated that the results showed that none of the outlying veins that were drilled warranted further development. Referring to the shaft-area drilling he said: "All of these holes cut the three, main, steep veins and, in the shaft section, intersected four parallel flat veins across a width of 95 feet. Practically all of the main vein intersections were reasonably strong and well-mineralized but, as will be noted, all assays were very low with the exception of one assay from the intersection of No. 4 flat vein in hole 27 that returned 6.80 dwts. across 0.8 feet."

References

O.D.M. Vol. XLIV, 1935, pt. 1, p. 68.
Canadian Mines Handbook, 1944, pp. 247, 248.
Canadian Mines Handbook, 1959, p. 152.
Reports by G. L. Holbrooke (1945) and J. W. McBean (1945) in O.D.M. Resident Geologist's files, Kirkland Lake.

AMALGAMATED KIRKLAND MINES LTD.**Location**

Teck township; south of the Main ore zone.

Chief Metal Present

Gold.

History and Development

Amalgamated Kirkland was formed in 1939 and acquired 17 claims adjoining Teck-Hughes, Kirkland Lake Gold, and Macassa properties on the south. The property includes the former Kirkland-Kalgoorlie, Canadian Kirkland, and Kirkland-Hunton ground, on all of which shafts were sunk and underground work done in the early 1920s. Surface diamond-drilling was done along a "break" in the northern part of the property in 1939, and in 1944 two drillholes were extended to the south into Amalgamated Kirkland ground from the end of a crosscut on the 3,000-foot level of the Macassa mine. The property has been idle since 1945.

Geology

The rocks exposed on Amalgamated Kirkland ground consist of Timiskaming sediments and tuffs intruded by syenite, syenite porphyry, basic syenite, and diabase dikes. An elongate irregularly shaped body of syenite porphyry and basic extends across the northern part of the property. The north margin of a syenite stock lies near the south boundary of the claims. Between these intrusive masses the interbedded sediments and tuffs have been greatly dragfolded and faulted. (See O.D.M. map No. 1945-1)

References

O.D.M. Vol. LVII, 1948, pt. 5, pp. 34-36.
Diamond-drilling information, geological plans, etc., in O.D.M. Resident Geologist's files, Kirkland Lake.
Northern Miner, 7 July 1960.

Remarks

Control of Amalgamated Kirkland by the Little Long Lac group was acquired in 1960.

AMALGAMATED LARDER MINES LTD.**Location**

Along the Larder Lake "break" in the southeastern part of McVittie township and the southwestern part of McGarry.

Chief Metal Present

Gold.

History and Development

Amalgamated Larder was incorporated in 1941, and combined a number of adjoining mining properties in the above-mentioned location. In addition to several small claim groups the properties taken over included Fernland, Cheminis, and Sarcee. In 1942, the Barber Larder property was also purchased.

During the period 1937-1940, Consolidated Mining and Smelting Co. of Canada Ltd. sank a shaft and opened several levels on each of the 3 properties, Barber Larder, Cheminis, and Fernland. Considerable surface and underground diamond-drilling was done by this company.

Amalgamated Larder drilled 19 holes in 1942 to prospect certain sections of

virgin ground along the gold-bearing horizon. Some mineralization and low gold values were obtained, but no ore was reported from these operations.

- Geology** On the Amalgamated Larder ground the rock formations strike in a general east-west direction and consist of interbanded sediments and volcanics of the Timiskaming series cut by an occasional narrow dike of diorite or lamprophyre. The gold-bearing horizon lies within a band of highly sheared and carbonate basic lavas and tuffs of Keewatin age along the Larder Lake "break". The schists within the "break" have been replaced by the carbonate rock or "dolomite", which usually contains a network of barren white-quartz veins. The gold is present in scattered sulphide bodies that occur as irregular patches, in veinlets, or in banded zones running parallel to the schistosity.
- The sulphides replace either flows, flow breccias, or tuffs. This favourable lava-tuff-carbonate horizon that extends westward from the Kerr-Addison to the Omega mine strikes across the Amalgamated Larder ground for more than $3\frac{1}{2}$ miles.
- Ore Reserves** In the Cheminis mine, 247,383 tons averaging 0.154 ounces of gold per ton, cut grade; in Barber Larder, 21,700 tons, grade not stated; in Fernland, 24,667 tons averaging 0.196 ounces per ton, uncut. (Canadian Mines Handbook, 1947)
- References** O.D.M. Vol. L, 1941, pt. 7, pp. 45, 56.
O.D.M. Resident Geologist's files, Kirkland Lake.
- Remarks** Amalgamated Larder was financed by 4 mining companies, each participating equally in the venture: Anglo-Huronian Ltd., Noranda Mines Ltd., Ventures Ltd., and Consolidated Mining and Smelting Co. of Canada Ltd.
- The original property has been dormant since 1947. Since January 1959, Amalgamated Larder has been active in the exploration field.

ANOKI GOLD MINES LTD.

- Location** Adjoining the property of Queenston Gold Mines Ltd., in Gauthier township. Shaft is on claim L.3894.
- Chief Metal Present** Gold.
- History and Development** Anoki Gold Mines Ltd. was organized in 1938, and acquired the property of Oriole Mines Ltd., which in 1927 had taken over the claims of Elstone-Kirkland Mines Ltd. Gold was first discovered on these claims in 1916, and since then development work and diamond-drilling have been carried on at different times by various companies.
- A shaft was sunk to a depth of 500 feet in 1938, and deepened to 754 feet in 1939-40. Four levels were opened, and an ore shoot of marginal grade was outlined on the 350- and 475-foot levels, but nothing of any consequence was found on the deeper levels. Operations were suspended in December 1940.
- Geology** Most of the property is covered by heavy overburden. In the vicinity of the shaft are exposures of basic lava that are cut by a variety of intrusives including syenite porphyry, gabbro, lamprophyre, and diabase.
- The Larder Lake "break" that occupies the low ground north of the outcrops dips about 30° to the southwest where it was encountered in the Anoki shaft close to the 725-foot level. This sheared zone is about 300 feet wide

and is underlain by conglomerate. It contains a central core of "green carbonate" bordered by talc-chlorite schist.

The ore shoot that dips to the northeast at about 60° and rakes to the south-east at about 35° lies within a mass of light-coloured rock that is probably an altered intrusive. The rock is mineralized and silicified and is cut by quartz stringers. Values are reported to be confined to certain patches of sulphides that are largely pyrite.

References

O.D.M. Vol. L, 1941, pt. 8, pp. 13-15.
Canadian Mines Handbook, 1947.

Remarks

Property sold to Queenston Gold Mines Ltd. in May 1946. Additional diamond-drilling from surface and underground at the Anoki Mine was done by Queenston in 1947.

ARJON GOLD MINES LTD.

Location

The property consists of a group of 5 patented claims in the west-central part of the McGarry township, adjoining Kerr-Addison Gold Mines. The claim numbers are: L.899, L.25194, L.25195, L.25196, L.25477 (L.935).

Chief Metal Present

Gold.

History and Development

Arjon Gold Mines Ltd. was incorporated in 1937 to develop the above-mentioned group of 5 claims. Claim L.25195 (H.F.39) was the former Cockshutt-McCallum property that was known as the Christie claim when it was first staked in 1920. Early work consisted of pitting and trenching. Arjon Gold Mines explored the property by surface-trenching and diamond-drilling in 1937, and additional drilling was done in 1938. Eighteen holes, comprising 8,880 feet, were put down to investigate veins, sheared zones, and carbonate bodies on different parts of the property. No ore was found, and before the end of 1938, work was discontinued. Some additional surface diamond-drilling was done in 1945-46. Arrangements were made with the adjoining Kerr-Addison Gold Mines, in 1949, to drive an exploratory crosscut into Arjon ground from Kerr-Addison's 2,500-foot level. Underground diamond-drilling was done from the crosscut, but the project was abandoned in 1951 when no gold values of importance were found.

Geology

The south contact of the regional belt of Timiskaming sediments, volcanics, and pyroclastics with the older Keewatin lavas extends across the south boundary of the north claim (L.25196.) The greater part of this claim is underlain by trachyte, agglomerate, and tuff, with a narrow band of greywacke at the Timiskaming-Keewatin contact. Southward the rocks on the remaining 4 claims consist of basic lavas, greywacke, syenite porphyry, and carbonate bodies. The carbonates are localized along pre-existing sheared zones. The syenite porphyry forms irregularly shaped masses that intrude the lavas. Many of the porphyry outcrops show strong shearing as the result of faulting movement in their vicinity. The carbonate band in the southeastern corner of the property is localized along the Larder Lake "break".

Production

None.

References

O.D.M. Vol. XXXIII, 1924, pt. 3, p. 24.
O.D.M. Vol. XLVII, 1938, pt. 1, p. 48.
O.D.M. Vol. L, 1941, pt. 7, pp. 44, 45.
Canadian Mines Handbook, 1952, p. 11.

Report by J. C. Rogers (1937) and diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks Arjon Gold Mines Ltd. continues to be active in outside exploration and as a holding company.

ARMISTICE GOLD MINES LTD.

Location The property consists of a group of 16 patented claims bordering on the east, north, and west shores of Barber Lake in McGarry township. The claim numbers are: T.1886, T.1932, L.25255, L.25256, L.25257, L.25258, L.25259, L.25260, L.25475, L.25476, L.25477, L.25478, L.25481, L.25482, L.25483, L.25489.

Chief Metal Present Gold.

History and Development Exploration and development work on the property has been concentrated in the southeast corner of claims T.1886 and T.1932. The latter, which adjoins the property of Kerr-Addison, was staked by W. Petkethly in 1906 and patented in 1910. The claim west of it, T.1886, also was staked in 1906, and patented in 1910, by M. T. Culbert. The remaining 14 claims were staked in 1933 for Minefinders Ltd. Armistice Gold Mines Ltd. was incorporated in 1937, and acquired claim T.1932 and the Minefinders claims. In that year over 6,000 feet of diamond-drilling was done on claim T.1932. Additional drilling, totalling over 8,000 feet, was done in 1941. Claim T.1886 was acquired in 1943; following a program of diamond-drilling, a shaft was started on that claim late in 1945. Underground development work and diamond-drilling was carried on until all operations ceased, before the end of 1948. At that time the shaft was 1,281 feet deep and 8 levels had been opened. One diamond-drillhole was deepened in 1951.

Geology On the claims in the vicinity of Barber Lake, Keewatin lavas and Timiskaming sediments are intruded locally by irregular masses of syenite porphyry. A carbonatized fault zone along the contact between sediments and lavas strikes N.65°E. across the middle of claim T.1886 and the northwestern part of claim T.1932. This vertical fault zone is the Larder Lake "break". A parallel sheared and faulted zone lies about 400 feet south. The shaft was sunk in the east-central part of claim T.1886 on the southeast side of the carbonatized Larder Lake "break".

Sampling Results It appears reasonably certain, from the extensive amount of drilling and underground work, that there is not a sufficient concentration of gold values to make an orebody between the surface and the 1,250-foot level, in the shaft area. (Annual report, 1948, Armistice Gold Mines Ltd.)

References O.D.M. Vol. LV, 1946, pt. 2, p. 6.
O.D.M. Vol. LVIII, 1949, pt. 2, p. 5.
Canadian Mines Handbook, 1949, pp. 18, 19.
Diamond-drilling records in the O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks Armistice Gold Mines Ltd. was taken over in 1954 by Pardee Amalgamated Mines Ltd., which in turn was absorbed by Rio Algom Mines Ltd. in 1961.

BALDWIN CONSOLIDATED MINES LTD.

Location The main property is in the northeast corner of Eby township, and consists of 4 patented claims and the patented N½ of lot 2, concession VI. Claim numbers are L.17658, L.17659, L.17990 and L.18683. Another nearby

property held by the company consists of 3 patented claims numbered L.14192, L.40218, and L.24029 in Teck township, and 2 water claims in the Blanche River which are L.O. 42119 in Teck and L.O. 42120 in Grenfell township. The main shaft, known as the Kelmec, is near the centre of the N $\frac{1}{2}$ of lot 2, concession VI, Eby township.

Chief Metal Present Gold.

History and Development

The property, first known as the Baldwin, has been intermittently active since 1911 when gold was first found there by a prospector from whom the old company took its name.

Baldwin Consolidated Mines Ltd. was incorporated in 1946, and acquired property from Baldwin-Kirkland Gold Mines Ltd., Lucky Kirkland Gold Mines Ltd., Kelmec Mines Ltd., and Sylvanite Gold Mines Ltd.

Exploration and development by previous owners consisted of surface-trenching, about 12,000 feet of surface and underground drilling, and underground exploration from the Kelmec shaft. The 2-compartment shaft was sunk 420 feet, and 4 levels were opened at 100-foot intervals. About 4,000 feet of drifting and crosscutting was done, mostly on the 200- and 300-foot levels. This work covered a 500-foot length of the contact zone between Keewatin lavas and Timiskaming sediments. Crosscuts were driven on the second and third levels; an ore shoot 60 feet in length was found on the third level and was stoped to a height of 45 feet. A 20-foot length of ore on the second level is considered to be the upward extension of this ore shoot.

After acquiring the property in 1946, Baldwin Consolidated Mines dewatered and sampled the old workings; the surface and underground geology was mapped in detail, and a series of short underground holes, totalling 1,300 feet, were drilled.

Geology

Sediments of the Timiskaming series cover most of the northern part of the claims, and Keewatin volcanics and intrusive diorite lie to the south. The sediments consist mainly of interbedded conglomerate and greywacke. The volcanics are andesitic in composition and locally show poorly-developed pillows. Bodies of syenite, basic syenite, and syenite porphyry are found along the lava-sediments contact zone. The Larder Lake fault may be the structure that leaves this contact east of the shaft and continues along the railway cut (*see* O.D.M. Map No. 1946-1) or it may be the strong east-west fault that underlies the Blanche River to the north. Additional development work will be necessary before it can be definitely stated which of these structures is the main fault zone.

According to G. L. Holbrooke, there are 2 different ages of vein-material in the mine workings. The earlier occurrences consists of numerous irregular quartz-carbonate veinlets in a sheared zone. The later and more important veins occur as a system of narrow quartz veins trending N.65°E. and dipping south at about 70°. The best values were found in the principal vein of this system where there was considerable fracturing and faulting.

Production

In the years 1929 and 1938, a total of 81 tons of ore yielded gold valued at \$1,247. (O.D.M. Vol. LVIII, 1949, pt. 1, Table II)

References

O.D.M. Vol. LVII, 1948, pt. 5, pp. 36, 37.
Report by G. L. Holbrooke, 1946, in O.D.M. resident geologist's files, Kirkland Lake.

Remarks

The property has been dormant since 1947.

BARRY-HOLLINGER GOLD MINES LTD.

- Location** The property consists of a group of 9 patented claims occupying all of lot 3, concession VI, and the SE $\frac{1}{4}$ of the N $\frac{1}{2}$ of lot 4, concession VI, Pacaud township. The claim numbers are: L.12277, L.12278, L.12279, L.12313, L.17930, L.17931, L.17982, L.17983, L.17984.
- Chief Metal Present** Gold.
- History and Development** The property was first known as the Boston-Hollinger and consisted of the 2 claims, L.17930 and L.17931, on the north boundary of lot 3, concession VI. It was taken over by the Patricia Syndicate in 1917, and mining and milling in 1918 resulted in 1,502 tons of ore producing gold to the value of \$10,051. Barry-Hollinger Gold Mines Ltd. was incorporated in 1919 and took over the Patricia property, and by 1927 had acquired the remainder of the claims in the group. The mine shaft and buildings are on claim L.17930 (NW $\frac{1}{4}$ of N $\frac{1}{2}$, lot 3, con. VI). The original buildings were destroyed by a forest fire in 1919. Operations were resumed in 1925, and production was continuous until 1936 when the mine closed. The company was reorganized in 1927 and the name was changed to Barry-Hollinger Mines Ltd. The property lay dormant from 1936 to 1944 when a clean-up of the mill was started. These operations resulting in a small production during the years 1944-45-46.
- The mine workings were serviced by a shaft to the 1,000-foot level and a winze from the south crosscut on the 1,000-foot level to the 2,250-foot level.
- Geology** The property is underlain by 2 series of Keewatin volcanics that are in faulted contact. The fault, known as the Pacaud fault (*see* O.D.M. Map No. 1957-14), is assumed to strike southeast through the middle of the property and separates a series of sheared and altered tuffs and tuffaceous sediments on the southwest from a thick series of basic lava flows lying northeast of the fault. A compound sill, which is believed to be Haileyburian in age, strikes northwest across the northeast corner of the property. It is composed of hornblendite and serpentinite, and is offset by a number of transverse and diagonal faults, some of which strike southwest and west into the property. Similar faults that preceded ore deposition are present in the mine workings. The younger intrusive rocks consist of a few dikes and small masses of Algoman syenite porphyry.
- Burrows and Hopkins reported that 12 veins were found on the property, but L. V. Bell, who examined the mine in 1928, stated that the entire output up to that time had been derived from one vein, known as the No. 7, which strikes N.57°E., and dips southeast at 70°. This vein was described as varying considerably in width and having a well-defined fault plane on the hanging wall. Quartz was found in the vein as irregular lenses, and because the presence of gold was shown to be largely dependent on the quartz, the values were not consistent.
- Geology** The mine workings are in the Keewatin basic lavas and several diorite porphyry and syenite porphyry dikes were encountered underground.
- Total production, including the 1,502 tons mined by Patricia Syndicate in 1918, amounted to \$1,622,118 from 267,741 tons of ore milled. (O.D.M. Vol. LVIII, 1949, Table I in pocket)
- References** O.D.M. Vol. XXX, 1921, pt. 6, p. 14.
O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 98.
O.D.M. Vol. XLVI, 1937, pt. 1, p. 101.

O.D.M. Vol. LXVI, 1957, pt. 5, pp. 45, 46.
Canadian Mines Handbook, 1947, p. 181 (Lebon).

Remarks Lebon Gold Mines Ltd. was incorporated in 1945 and acquired the Barry-Hollinger property.

BIDGOOD KIRKLAND GOLD MINES LTD.

Location The property, which consists of a group of 22 patented claims, lies between Mud Lake and McTavish Lake in the northeast quarter of Lebel township. The claim numbers are: LS.6, LS.221, L.3094, L.3095, L.6781, L.6796, L.7407, L.7592, L.7593, L.7760, L.7761, L.7762, L.7763, L.7764, L.8005, L.8006, L.8027, L.8086, L.9031, L.9882, L.9886, L.9891.

Chief Metal Present Gold.

History and Development Bidgood Gold Mines Ltd. was incorporated in 1919 to prospect and develop 8 claims, which were the nucleus of the above-mentioned group. A number of veins found on the surface had a northeast-southwest strike with steep dips to the northwest. A shaft was started on the No. 9 vein on claim L.6796 close to the north shore of Mud Lake. By 1923, this No. 1 shaft had been sunk to a depth of 600 feet, and levels had been opened up at the 300-, 400-, and 600-foot horizons. In that year the mine closed, and the company was reorganized under the name of Bidgood Consolidated Mines Ltd. The mine was dewatered in 1927, and diamond-drilling and lateral work underground was carried on for 2 years. In 1928, the No. 1 shaft was deepened to 725 feet, and a second shaft was started on claim L.9882, $\frac{3}{4}$ mile northeast. This No. 2 shaft, which was to become the producing mine, had been sunk to a depth of 500 feet when operations were again suspended in 1931. The western claims of the present group were acquired in 1929 from Cambro-Kirkland.

Bidgood Kirkland Gold Mines was incorporated in 1933 to take over the property, and mining was resumed at the No. 2 shaft. Production from this mine began in 1934, and was continued until 1949, the ore having come from many levels to a depth of 2,075 feet.

Geology The Bidgood Kirkland property lies wholly within the Timiskaming series of interbedded sedimentary and volcanic formations. The rocks exposed at surface are conglomerate, greywacke, tuff, and trachyte, intruded by masses of feldspar porphyry, quartz porphyry, diorite, and syenite.

Almost all ore produced came from 7 veins; these veins are in the diorite stock that occupies a considerable part of claim L.9882 and extends south into the Moffat-Hall ground. The veins are gold-bearing quartz veins (with associated pyrite and molybdenite) that occupy northeast striking and northwest-dipping thrust fault fractures. The strongest "break" of this series occurring in the mine working is known as the "Bidgood fault". O.D.M. Map No. 53a shows several similar faults with approximately the same strike crossing the property; all these faults are cut by later faults with a more northerly strike.

Within the mine this type of post-ore cross-faulting is common, and it caused a great deal of trouble; the difficulty was further complicated by the fact that many of the ore lenses were small, and vertical as well as horizontal movement had to be taken into consideration in searching for their extension.

In the underground workings at the No. 1 shaft on claim L.6796, the No. 9

vein is on or near the contact between a feldspar porphyry and a medium-grained hornblende syenite. The vein is usually in a fracture zone in the syenite, which could be the southwesterly extension of the Bidgood fault.

- Production** During the years 1934-49, and 1951, Bidgood Kirkland Gold Mines Ltd. produced gold to the value of \$5,917,133 from 586,367 tons of ore. (O.D.M. Vol. LXIV, 1955, pt. 1, p. 14)
- References** O.D.M. Vol. XXXII, 1923, pt. 4, pp. 73, 74.
O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 155, 156.
Structural Geology of Canadian Ore Deposits, Vol. I, C.I.M.M. Geology Division, 1948, pp. 653-658.
O.D.M. Vol. LIX, 1950, pt. 2, pp. 5, 6.
Report by G. E. Parsons (1950) in O.D.M. Resident Geologist's files, Kirkland Lake.
- Remarks** Bidgood Kirkland Gold Mines Ltd. was reorganized in 1956, and the name was changed to Bidcop Mines Ltd.

BLACK GOLD MINES LTD.

- Location** Group of 6 patented claims, 5 of which are in Teck township at Milepost III on the east boundary and one (L.1536) in the adjoining township of Lebel. Claim numbers in Teck township are: L.2728, L.1534, L.1535, L.1437, (L.9011), L.1439. (See O.D.M. maps Nos. 1945-1 and 53a.)
- More than half of the property is in the built-up residential section of the eastern part of the town of Kirkland Lake.
- Chief Metal Present** Gold.
- History and Development** The key claim (L.2728) of the group was acquired in the early days of the camp. Surface prospecting at that time discovered 3 parallel veins on a knoll of conglomerate in the northern part of this claim which adjoins the south boundary of the Wright-Hargreaves property. These veins, in which visible gold was reported, occur within a width of 180 feet and are numbered 1, 2, and 3 from north to south. They strike slightly north of east and dip to the south. Although the wallrock at the surface is conglomerate, drilling has shown that the No. 1 vein passes into a wide porphyry dike, and that the No. 3 vein lies close to another narrow porphyry dike.
- Work on the property has been largely confined to claim L.2728. About the year 1917, an inclined shaft was sunk 125 feet on the No. 1 vein, and about 40 feet of drifting was done. The No. 2 vein, 125 feet to the south, was opened on the surface for a distance of about 320 feet. In 1932, No. 1 drillhole was put down to section the claim from south to north, and revealed gold values in the No. 1 and No. 2 veins. In 1935, a crosscut was driven from the shaft to the No. 2 vein on the 125-foot level. The vein was drifted for 200 feet east of the crosscut and 95 feet west of it.
- A total of 13 drillholes were put down to search for the possible extension of the veins in the shaft-area and to investigate the nearby Murdock Creek fault. Most of this drilling was done in 1937.
- Geology** The claims are underlain by rocks of the Timiskaming series and consist of greywacke, conglomerate, tuff, and a small amount of trachyte. The

Murdock Creek fault strikes across the property in a northeasterly direction and dips to the northwest. This fault was indicated in hole No. 1 by a 39-foot width of broken rock replaced by quartz and calcite that carried low gold values.

Dimensions and Grades

In the drifting on the 125-foot level, most of the main vein (the No. 2) was narrow and consisted of fractured stringers containing auriferous pyrite. The pyrite contained gold values over an average width of 6 inches. According to Hopkins, the values were consistent over the exposed length of the vein but, when calculated to a mining width of 3 feet, gave the following very low average values:

Vein	Location	Length	Width	Assay
No. 2.....	East Drift	200 feet	3 feet	\$1.42
No. 2.....	West Drift	95 feet	3 feet	\$1.39

References

O.D.M. Vol. LVII, 1948, pt. 5, pp. 37, 38.
 Reports by H. Hopkins (1934) and J. A. Baker (1936-37) in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

The charter of Black Gold Mines Ltd. was cancelled in 1958, and the property reverted to the Crown. Claims L. 2728 and L.1535 were withdrawn from staking under Section 39B of the Mining Act. D. L. McKinnon restaked the remainder of the property and drilled 3 short holes on the claim in Lebel township (now L.71904) in 1961.

BROCK GOLD MINES LTD.

Location

The property consisted of a group of 8 patented claims that now occupy the northwest corner of the holdings of Upper Canada Mines Ltd. in Gauthier township. The claim numbers are: L.6317, L.6319, L.8113, L.8114, L.8371, L.8372, L.8590, L.9312.

Chief Metal Present

Gold.

History and Development

Brock Gold Mines Ltd. was incorporated in 1938 and acquired 5 claims formerly held by McIntyre-Montgomery and 3 adjoining claims to the east that had been Tobico ground. Following a program of diamond-drilling, a shaft was started late in 1940 on the north boundary of claim L.8371 in the southeast corner of the property. The shaft was sunk to a depth of 630 feet, with levels at 200, 325, 450, and 575 feet. Crosscuts were driven south on the 325-foot level, and both north and south on the 575-foot level. A small amount of drifting and underground drilling was done before the mine closed in 1941.

Geology

The rocks on the property are a complex assemblage of Timiskaming volcanics and sediments cut by irregularly shaped bodies of intrusives. In the vicinity of the mine workings, the Timiskaming rocks are trachyte, trachytic agglomerate and breccia, and tuff. The intrusives consist largely of Algoman syenite and syenite porphyry, and later diabase. Surface work and diamond-drilling revealed 2 more or less parallel zones of quartz veins and sulphide mineralization, trending slightly north of east, about 1,100 feet apart. The shaft was sunk approximately midway between the 2 zones.

Grade

Scattered gold values in the 2 mineralized zones; no ore reported from the underground developments.

References O.D.M. Vol. L, 1941, pt. 8, p. 18.
O.D.M. Vol. LI, 1942, pt. 1, pp. 18, 19.
Canadian Mines Handbook, 1947, pp. 314, 315.
Diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks Upper Canada Mines Ltd. acquired the property in 1946.

BURTHO GOLD MINES LTD.

Location Eby township, lots 6 and 7, concession VI. In 1947 the company acquired the land on these 2 lots and the following water claims on them north in Kenogami Lake: L.39107, L.41458, L.41459, L.48761, L.51580, L.52039, L.52040, L.52041, L.52042, L.52043.

Chief Metal Sought Gold.

History and Development Burtho Gold Mines Ltd. was incorporated in Manitoba in 1947 as a wholly-owned subsidiary of God's Lake Gold Mines Ltd. It was formed to acquire and develop properties in Ontario. Exploration work in 1947-48 on the Eby township property consisted of geological mapping and the drilling of 8 holes to investigate assumed fault zones that are shown crossing the property on O.D.M. Map No. 1946-1.

Geology Kenogami Lake occupies the greater part of lots 6 and 7, concession VI, Eby township. South of the lake, the predominant rock types are intermediate and basic volcanics of Keewatin age with minor intrusions of syenite and syenite porphyry dikes. Timiskaming sediments and tuffs lie north of the volcanics on the west boundary of lot 7. All the above-mentioned rock types are cut by narrow diabase dikes. Cobalt sediments form the promontories that project into the lake along the township line on the north boundary of the property.

O.D.M. Map No. 1945-1 shows 2 roughly parallel zones of shearing striking north of east across the south half of the property. The most northerly of these zones, indicated on the map by 2 closely-spaced converging faults, was cut in 4 holes, spaced at intervals over a length of 4,300 feet. This well-defined structure may be the Larder Lake fault. The second zone of shearing about 600 feet south and the adjoining porphyry and carbonate rock were probed by 2 holes. These fault zones were marked by shearing, brecciation, carbonatization, local mud seams, and some quartz veins and stringers.

Sampling Results No gold values were obtained in the drilling program.

References O.D.M. Vol. LVII, 1948, pt. 5, pp. 38, 39.
Diamond-drilling logs and location sketch in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks The charter of Burtho Gold Mines Ltd. was cancelled in 1959.

CASAKIRK GOLD MINES LTD.

Location Group of 14 patented claims in the central part of Teck township northwest of the property of Macassa Mines Ltd. Claim numbers are: L.1223, L.1340, L.1342, L.1343, L.1429, L.1432, L.5040, L.5041, L.6013, L.6014, L.6804, L.6805, L.9106, L.9107. (See O.D.M. Map No. 1946-1)

Chief Metal Present Gold.

History and Development Casakirk Gold Mines Ltd. was organized in 1936 to consolidate a group of claims that included the former Clark, Devellierrs, Belcher, Barney, Barnette Legris, and Abba properties. In earlier operations a shaft had been sunk to a depth of 127 feet on claim L.1429 of the Abba property. In 1940 Macassa Mines Ltd., in association with Hollinger Consolidated Gold Mines Ltd., undertook to drive a crosscut into the property from the 3,000-foot level of the Macassa mine. The crosscut was driven 721 feet into Casakirk ground, but no ore bodies were found, although a gold-bearing vein was intersected about 50 feet north of the Macassa-Casakirk boundary. This vein was investigated by drifting.

Geology The northern claims of the group are underlain by massive diorite and gabbro and a small amount of greenstone. South of these basic intrusives are horizons of tuffs and conglomerate followed by an irregularly shaped mass of syenite porphyry, basic syenite, and intermingled sediments and tuffs. In the general vicinity of the railway, prospecting has found several veins and shear zones. There is also some shearing immediately north of the old shaft on claim L.1429.

References O.D.M. Vol. XXXVII, 1928, pt. 2, *see* map facing p. 94.
O.D.M. Vol. LVII, 1948, pt. 5, p. 40.
Reports by J. K. Gustafson (1940-1941), and diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks Dormant since 1942.

CATHROY LARDER MINES LTD.

Location The main property consists of a group of 9 patented and 2 unpatented claims straddling the boundary line between McElroy and Catharine townships. The claim numbers are as follows:
McElroy township, patented claims: L.26272, L.26273, L.27303, L.31257, L.31377, L31378, L.31749.
McElroy township, unpatented claims: L.73125, L.73126.
Catharine township, patented claims: L. 24690 (NE. $\frac{1}{4}$ of N. $\frac{1}{2}$, lot 7, con. VI) and L. 24691 (NW. $\frac{1}{4}$ of N. $\frac{1}{2}$, lot 7, con. VI).

Chief Metal Present Gold.

History and Development Claims on this property were recorded as early as 1918. The present group was acquired in 1937 by Yama Gold Mines Ltd. Following considerable surface trenching and diamond-drilling, shaft-sinking commenced in 1938 in the southwest corner of claim L.26272. By March 1943, when all operations ceased, the shaft was 528 feet deep, and mining had been done on 4 levels. A 50-70 ton mill was put into operation late in 1941. Most of the Yama workings are confined to the shaft-area.

Cathroy Larder Mines Ltd. was incorporated in 1943 to succeed Yama Gold Mines Ltd. Surface diamond-drilling in 1945 outlined a new gold-bearing zone on claim L.24690 south of the Yama workings. Underground work by Cathroy Larder Mines was chiefly confined to this zone on the 250- and 500-foot levels. There was minor production in 1944 and again in 1947. Operations came to an end in 1948. Mirado Nickel Mines Ltd. optioned the claims early in 1961 and, after an extensive program of diamond-drilling from surface and underground, purchased the property later the same year through the company's subsidiary, Royado Mines Ltd.

Geology	<p>The country rock is largely Keewatin fragmental volcanics and rhyolite, cut by small dikes of syenite porphyry, diorite, and lamprophyre. In the vicinity of the mine are several sheared zones that strike parallel to the strike of the fragmental volcanics (S.70°E.) and dip steeply to the north. The ore shoots mined by Yama Gold Mines in the shaft-area occurred as a series of more or less parallel mineralized zones in moderately schistose fragmental volcanics. Each zone consisted of a number of narrow fractures heavily mineralized with gold-bearing sulphides.</p> <p>The new south zone explored by Cathroy Larder Mines is in sheared fragmental volcanics that have been strongly silicified, carbonatized, and mineralized. The gold is associated with sulphides that are in seams and irregular masses throughout the host rock. The sulphides consist chiefly of pyrite, with some chalcopyrite and sphalerite.</p>
Production	Total production from Cathroy Larder (formerly Yama) Mines Ltd. amounted to \$118,750 from 22,250 tons of ore milled. (O.D.M., Vol. LVIII, 1949, Table 1, in pocket)
References	<p>O.D.M. Vol. XLVIII, 1939, pt. 1, p. 218. O.D.M. Vol. LIII, 1944, pt. 1, p. 169. O.D.M. Vol. LVIII, 1949, pt. 2, p. 14. O.D.M. Vol. LIX, 1950, pt. 6, pp. 39-45. Canadian Mines Handbook, 1961, p. 47. Canadian Mines Handbook, 1962, p. 48. Reports by C. S. Johnston (1947-48), B. J. Keating (1948), and diamond-drilling information in O.D.M. Resident Geologist's files in Kirkland Lake.</p>
Remarks	Exploration by diamond-drilling from surface was continued in 1962 by Mirado Nickel Mines Ltd.

CHESTERVILLE LARDER LAKE GOLD MINING CO. LTD.

Location	The property consisted of a group of 17 patented claims extending in a north-easterly direction from about the centre of McGarry township. The claim numbers are: L.821, L.891, T.1860, T.1861, L.5413, L.5414, L.5415, L.6623, L.6624, L.6625, T.8188, L.24181, L.24371, L.25854, L.31550, L.31551, L.31552.
Chief Metal Present	Gold.
History and Development	<p>Chesterville Larder Lake Gold Mining Co. Ltd. was incorporated in 1907 during the first gold rush into the Larder Lake area. At that time the company sank 2 prospect shafts to a depth of 30 feet on a gold showing on claim T.1860 (H.F. 404) originally staked by J. T. Kearns. The property lay dormant for many years, but in 1937 a diamond-drilling program on claim T.1860 indicated more than a million tons of ore in the southern part of the claim. The group at that time consisted of 3 claims. In 1938, the 2 adjoining claims of Rose Gold Mining Co. Ltd. were acquired, and 10 claims were taken over from Shaver McGarry (Lucky Boy) Gold Mines Ltd. Two additional claims southeast of the holdings were acquired in 1940.</p> <p>Underground development started in 1938, and by the time all operations ceased in 1952, the shaft was 2,799 feet deep, and 20 levels had been opened. A 500-ton mill was built early in 1939, and the company went into production that was continuous until late 1952. The name of the company was changed to Chesterville Mines Ltd. in 1946.</p>

Geology	<p>The rock formations on the property have a regional strike of N.60°E. to N.70°E., but are locally contorted by close folds. The Larder Lake "break", with the same strike, crosses claim T.1860 and several other southern claims of the group. Keewatin lavas south of the break are in fault contact with Timiskaming sediments to the north. These sediments in turn are in fault contact with trachytic rocks and tuff in the northern part of the property. A few small irregular areas of intrusives were exposed in the mine workings.</p> <p>Kerr-Addison ground adjoins all 4 sides of claim T.1860 whose northeast corner is common with the southwest corner of claim L.891. All the ore bodies found on the Chesterville property were on claim T.1860. They occupied part of the gold-bearing horizon of carbonates and altered lavas in the Larder Lake "break" where it strikes into the property from the Kerr-Addison mine on the west. Certain ore bodies extended across the boundary between the 2 properties and were mined by both companies.</p>
Production	From 1939 to 1952, inclusive, the total production amounted to 3,260,439 tons of ore valued at \$13,307,581. (O.D.M. Vol. LXII, 1953, pt. 1, p. 15)
References	<p>O.D.M. Vol. XLIX, 1940, pt. 1, pp. 97, 98. O.D.M. Vol. L, 1941, pt. 7, pp. 59-63. Structural Geology of Canadian Ore Deposits, Vol. I, C.I.M.M. Geology Division, 1948, pp. 662-671. Canadian Mines Handbook, 1939, p. 54. Canadian Mines Handbook, 1959, p. 49. Diamond-drilling records in O.D.M. Resident Geologist's files, Kirkland Lake.</p>
Remarks	The original McGarry township property was turned over to Kerr-Addison in 1957. Outside properties were retained by the company, which was re-organized in 1959 and continues to be active in exploration.

CONTINENTAL-KIRKLAND MINES LTD.

Location	The property consists of a group of 27 patented claims that extends from the east boundary of the Toburn property for 3 miles across the north half of Lebel township at approximately N.70°E. The claim numbers are: L.2257, L.2430, L.2447, L.2448, L.2450, L.2452, L.2459, L.2676, L.2677, L.2790, L.2791, L.2807, L.2808, L.2886, L.2900, L.2901, L.7798, L.7799, L.3009, L.3010, L.3011, L.8819, L.8820, L.8821, L.8822, L.8823, L.8824.
Chief Metal Present	Gold.
History and Development	<p>Continental Mines Ltd. was organized in 1922 and acquired the group of 27 claims from 18 different owners. The last 9 claims listed above were formerly the Kirkland-Munro group. Considerable surface work was done and a shaft was sunk on the Post claim (L.2257) to a depth of 825 feet, with lateral work on several levels, before the mine closed in 1925. Continental-Kirkland Mines Ltd., which was incorporated in 1927, took over the property and sank the No. 2 shaft to below 500 feet on the Croteau claim (L.2807) about $\frac{3}{4}$ mile east of No. 1 shaft. Following lateral work on the 500-foot level, all operations were suspended in 1929.</p> <p>Control of the company was acquired jointly by Toburn Gold Mines Ltd., Premier Gold Mining Co. Ltd., and American Smelting and Refining Co., in 1936. Under the direction of Toburn Gold Mines, operations were resumed at No. 1 shaft, and considerable lateral work was done on the 800-foot level. A winze was sunk to open a level at 925 feet before the</p>

mine was allowed to fill with water in 1939. Some diamond-drilling from the adjoining Toburn property was done in 1947.

Geology

The rocks exposed on the property are sediments, tuffs, and trachytic flows of Temiskaming age, intruded by Algoman basic syenite, syenite, and feldspar porphyry. The eastern claims of the group are largely drift-covered. Mining operations were confined to the west half of the property, the northern claims of which are for the most part occupied by the intrusives. O.D.M. Map No. 53a shows the north branch of the Murdock Creek fault trending northeast across the centre of the property. It was to explore this structure that No. 2 shaft was sunk. The drifting on the 800-foot-level, serviced by No. 1 shaft, was done on 2 faults about $\frac{1}{4}$ mile apart that are parallel to the Murdock Creek fault. In No. 1 shaft-area, post-ore cross-faults with a northerly trend, associated with the O'Connell Lake fault zone on the neighbouring Toburn and Federal Kirkland properties, block-faulted sediments north into the intrusive zone, resulting in very complicated geological conditions underground. The gold-bearing quartz veins with associated sulphides that were explored underground could not be developed into commercial ore shoots.

References

O.D.M. Vol. XXXII, 1923, pt. 4, pp. 68, 69.
O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 154, 155.
O.D.M. Vol. XLVII, 1938, pt. 1, pp. 109, 219.
O.D.M. Vol. XLIX, 1940, pt. 1, pp. 105, 209.
O.D.M. Vol. LVII, 1948, pt. 2, p. 90.
Diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

A short program of diamond-drilling reported in 1962.

EASTWARD MINES LTD.

Location

The property consisted of a group of 11 patented claims in the west-central part of Gauthier township, now owned by Upper Canada Mines Ltd. The claim numbers are: L.9224, L.9225, L.9226, L.9227, L.9524, L.9525, L.9526, L.9527, L.9528, L.9529, L.9530.

Chief Metal Present

Gold.

History and Development

Eastward Mines Ltd. was incorporated in 1923, and the property subsequently was acquired by Noranda Mines Ltd. In 1941, a program of diamond-drilling, financed and directed by Noranda Mines, picked up the westward extension of the Upper Canada "break". Although zones of mineralization with low gold values were intersected, nothing of economic importance was found. Additional diamond-drilling was done by Upper Canada Mines Ltd. in 1949.

Geology

The property lies within the regional belt of Timiskaming sediments, volcanics, and pyroclastics but, with the exception of the northeast claim (L.9224), is almost entirely covered with overburden. Drillholes on claims L.9225 and L.9226 cut interbanded trachyte and sediments intruded by Algoman syenite and diorite, and a later north-trending diabase dike. (*See also* Upper Canada Mines Ltd.)

Sampling Results

Between 2 holes, earlier drilled by Eastward, another hole gave results of 9.2 feet at \$6.29, and 6.5 feet at \$12.10, indicating 2 veins 80 feet apart. (General Manager's report, 1949, Upper Canada Mines Ltd.)

References	O.D.M. Vol. XXXIII, 1924, pt. 1, p. 46. O.D.M. Vol. L, 1941, pt. 8, p. 18. O.D.M. Vol. LIX, 1950, pt. 2, p. 78. Canadian Mines Handbook, 1947, pp. 314, 315.
Remarks	Upper Canada Mines Ltd., acquired the property from Noranda in 1946. FEDERAL KIRKLAND MINING CO. LTD.
Location	Group of 10 patented claims, and one fraction in Teck and Lebel townships at O'Connell Lake. Claim numbers are: Teck township: L.2229, L.2260, L.2261, L.6526, L.6527, fraction of L.2490. Lebel township: L.1892, L.2449, L.2451, L.2502, L.2570. The property adjoins the Sylvanite and Toburn mines on the north. The shaft is on claim L.6527.
Chief Metal Present	Gold.
History and Development	Federal Kirkland Mining Co. Ltd., was organized in 1927 and took over claims of Kirkland Combined Mines Ltd., and Kirkland Federal Mines Ltd. Kirkland Combined Mines held the former Day and Wishman claims (L.6526 and L.6527) on which a shaft had been sunk to a depth of 200 feet. The shaft was deepened to 740 feet and lateral work was done on 3 levels. An exploratory crosscut was driven into Federal Kirkland ground from the 1,100-foot level of Toburn mine in 1938 and a similar crosscut was driven from the 2,475-foot level in 1944.
Geology	Basic syenite and lamprophyre cover much of Federal Kirkland ground. A band of syenite porphyry about 500 feet in width crosses the property in an east-west direction. Patches of Timiskaming sediments and tuffs occur around the intrusive bodies. According to Todd, the shaft is adjacent to a vein on which considerable trenching was done on the surface. This vein is a fracture zone occupied by quartz stringers and mineralized with pyrite and chalcopyrite. It is vertical at surface and dips 60° to the south on the 200-foot level where it is bounded on the north by porphyry and on the south by lamprophyre. On the 700-foot level this vein was reached by a crosscut, about 80 feet long, that passed through another unimportant southward-dipping fracture.
References	O.D.M. Vol. XXXII, 1923, pt. 4, p. 47. O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 150, 151. O.D.M. Vol. LVII, 1948, pt. 5, pp. 40, 41. Report by Erie Canadian Mines Ltd. (1935) in O.D.M. Resident Geologist's files, Kirkland Lake.
Remarks	The assets of Federal Kirkland Mining Co. Ltd. were acquired in 1958 by Cadamet Mines Ltd. FOUR NATIONS GOLD MINES LTD.
Location	The ground formerly held by this company is shown on O.D.M. Map No. 1946-1 to consist of a group of 11 claims in the southeast quarter of Grenfell township. The claim numbers were: Patented claims: L.7937, L.8215, L.8238½, L.8239, L.8785, L.8786, L.8787. Unpatented claims: L.10554, L.12178, L.14821, L.44645. The shaft is on claim L.14821.

Chief Metal Present	Gold.
History and Development	Four Nations Gold Mines Ltd. was incorporated in 1929. Prior to 1933 a shaft was sunk to 500 feet on claim L.14821, four levels were opened, and considerable lateral work was done. The company was succeeded by Four Nations Consolidated Gold Mines in 1933. Operations were resumed and continued until November 1934. During this time, an additional 1,965 feet of drifting and 1,451 feet of crosscutting were done. Four Nations Consolidated Gold Mines Ltd. was adjudged to be bankrupt in 1935.
Geology	<p>The northern part of the property, including the mine workings, is underlain by interbanded diorite and basic volcanics of the Keewatin series. South of the shaft the relatively flat-lying sediments of the Cobalt series cover the older rock formations. A sheared zone near the Blanche River on claim L.8239 strikes toward the shaft, but seems to be too far north to line up with the sheared zone explored underground on the 500-foot level unless there is some folding or faulting between the 2 points. Most of the underground exploration was done on the 500-foot level and the bulk of it was concentrated along the above-mentioned shear zone lying about 250 feet southeast of the shaft. This shear strikes about N.70°E. and dips steeply to the south. It is from 30 to 40 feet in width and contains some white quartz stringers, but the values found were generally low.</p> <p>In the vicinity of the shaft the veins strike N.55°E. to N.60E., and dip south at 65°-75°. Here the country rock is basic lava with horizons of porphyritic lava, especially at the east end of the workings. Narrow dikes of felsite and pyroxenite cut the volcanics. On the 250-foot level the No. 1 vein lies about 30 feet north of the shaft. It consists of a 4-foot width of quartz veinlets and pyritized wall rock, the quartz being from 1 to 2 feet in width and very sparsely mineralized.</p>
Sampling Results	An incomplete plan of the No. 1 vein on the 250-foot level showed practically all the assays to be less than 0.11 ounces of gold per ton across drift width. (M. E. Hurst)
References	<p>O.D.M. Vol. XLIV, 1935, pt. 1, pp. 94, 95. Field notes of M. E. Hurst, Provincial Geologist, who examined the property in 1934. O.D.M. Vol. LVII, 1948, pt. 5, pp. 39, 40. Miscellaneous surface and underground maps and assay plans in O.D.M. Resident Geologist's files, Kirkland Lake.</p>
Remarks	In 1944, A. E. Campbell of Stratford, owned 7 claims of the former Four Nations property, including claim L.14821 on which the mine is located.

GLENORA GOLD MINES LTD.

Location	The property consisted of 6 patented claims in the west-central part of Lebel township, east of the Toburn holdings. The southern claims took in part of the west arm of Gull Lake. The claim numbers were: L.2412, L.2426, L.2427, L.2428, L.2429, L.O.147.
Chief Metal Present	Gold.
History and Development	The northwestern claim of the group, L.2412, was staked by T. H. Tough in 1912. Most of the subsequent work was done on this claim, which in 1914 was acquired with adjacent claims by the Gull Lake Mining Co. This

company was superseded by London Gull Lake Mines Ltd., and a shaft 45 feet deep was sunk in 1924. Glenora Gold Mines Ltd. was incorporated in 1933 to take over the property from London Gull Lake Mines. Development work was largely confined to the Murdock Creek fault zone. Extensive trenching was followed by sinking a shaft to a depth of 465 feet, with levels at 150, 300, and 450 feet in 1936. The mine closed in July 1937. A surface diamond-drilling program was carried out in 1945.

Geology

The property, crossed by the Murdock Creek fault zone from northeast to southwest, is underlain by Timiskaming sediments and tuffs which have been intruded by basic syenite and feldspar porphyry dikes of Algoman age. Fragmental tuff lying southeast is in fault contact with sediments northwest along the Murdock Creek fault for $\frac{1}{4}$ mile in the south half of claim L.2412. The shaft was sunk on the most encouraging vein on the property which strikes N.85°E. and dips steeply to the south. This vein occurs on a tuff-conglomerate contact. To the west it enters Toburn ground, and to the east it is cut off by the Murdock Creek fault. This vein and several branches of the Murdock Creek fault were explored underground. The 1945 diamond-drilling explored the fault zone in 5 deep-angle holes drilled from the southeast.

Sampling Results

On surface the vein is reported to have assayed 0.259 ounces of gold per ton over 18 inches for a length of 265 feet. On the 150-foot level a length of 45 feet east from the Toburn boundary yielded 0.2 ounces over a width of 42 inches, but the rest of the vein gave low values. (Nelson Hogg)

References

O.D.M. Vol. XXXIV, 1925, pt. 1, p. 124.
O.D.M. Vol. XLVI, 1937, pt. 1, p. 136.
O.D.M. Vol. XLVII, 1938, pt. 1, p. 125.
Canadian Mines Handbook 1955, p. 259.
Reports by B. M. Shaub (1933), and N. Hogg (1951), with diamond-drilling information, etc., in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

Glenora Gold Mines Ltd. was reorganized in 1955 and became Glenn Uranium Mines Ltd. The claims reverted to the Crown in the spring of 1963.

GOLDBANKS MINES LTD.

Location

A group of 9 patented claims in the western part of Teck township. The claims, as shown on O.D.M. Map No. 1945-1, are: L.1218, L.2933, L.2934, L.23440, L.23441, L.24284, L.24285, L.24407, L.24408.

Chief Metal Present

Gold.

History and Development

Goldbanks Mines Ltd. was incorporated in 1937 to succeed the former Goldbanks-Kirkland Mines Ltd. Earlier development work consisted of surface trenches and 2 shafts. No. 1 shaft is 73 feet deep; about 200 feet of drifting and crosscutting was done on the 60-foot level. No. 2 shaft is 45 feet deep. Eighteen diamond-drillholes totaling about 6,000 feet were put down between 1937 and 1940. Most of the development work was concentrated along a zone of shearing and porphyry intrusives trending north of east across claim L.1218 and the southeastern part of claim L.24284. A geophysical survey was made in 1946.

Geology

The northern claims of the property are underlain by Keewatin volcanics. Timiskaming sediments and tuffs, intruded by syenite porphyry, lamprophyre, and diabase, occur on the southern claims.

Sampling Results

C. Foster Rice in his 1940 report on the Goldbanks property stated that the

No. 2 shaft was sunk in a strong shear containing lenses of quartz and a mud seam 1 inch in width. Samples taken across 2-foot widths of this shear zone in the shaft gave the following gold values:

- \$7.00 per ton at a depth of 20 feet.
- \$3.40 per ton at a depth of 25 feet.
- \$4.20 per ton at a depth of 30 feet.
- \$1.80 per ton at a depth of 35 feet.
- \$6.80 per ton at a depth of 40 feet.

References

O.D.M. Vol. LVII, 1948, pt. 5, p. 42.
Reports by T. L. Gledhill (1936), M. T. Barney (1938), and C. F. Rice (1940) in O.D.M. Resident Geologist's files, Kirkland Lake. Also diamond-drilling data.

Remarks

Claims reverted to the Crown in 1959 and were restaked. In 1962 the property was held by Hurd and Pollack of Kirkland Lake.

GOLDEN GATE MINING CO. LTD.

Location

A group of 23 patented claims in Teck and Otto townships, including the greater part of the village of Swastika.
Teck township claims: L.2692, L.2693, L.2696, L.2697, L.3749, L.4313, L.12088, L.12522, L.12619, L.12680, L.15971, L.16252, L.16418, L.16419, L.16523.
Otto township claims: L.9759, L.9760, L.9591, L.9592, and N½ of lot 8 in concession VI.

Chief Metal Present

Gold.

History and Development

Golden Gate Mining Co. was incorporated in 1934 and acquired the former Lucky Cross property previously held by Kirkland Gateway Gold Mines. The old workings of the Lucky Cross mine consisted of an inclined shaft to 250 feet and 2 levels. Kirkland Gateway Gold Mines deepened the inclined shaft in 1923 to the 350-foot horizon and opened another level. The property was leased in 1933 to the Lucky Cross Leasing Syndicate and was transferred to Golden Gate Mining Co. the following year.

Golden Gate Mining Co. sank a vertical shaft to a depth of 1,000 feet on claim L.2692. This shaft was connected to the old workings and levels were opened at intervals of 125 feet. A 150-ton mill was erected and commenced production in May 1938. It operated at 60-70 tons daily until the mine closed in the summer of 1942.

In June 1940, Golden Gate Mining Co. acquired the neighbouring property of Crescent Kirkland Gold Mines Ltd. where underground workings had previously been opened to a depth of 400 feet in the old Swastika mine on claim L.9592 in Otto township. A small amount of ore was milled from the Crescent Kirkland section in 1941 and 1942. The Crescent mine also closed in 1942. Considerable surface diamond-drilling was done on the Crescent Kirkland property from 1943 to late 1945 when the shaft was dewatered and underground work resumed. The shaft was deepened to 663 feet and lateral work was done on 2 levels which were driven eastward. Development work was carried on until April 1949 when the mine closed.

Geology

The rocks on the property consists of Keewatin volcanics, Timiskaming sediments and tuffs, carbonates, various types of acid intrusives, and later diabase and lamprophyre dikes. In the Golden Gate mine, the veins lie in an area where many irregularly shaped bodies of syenite porphyry intrude the basic volcanics. The veins have a general strike of about N.53°E. and dip steeply north. They have been cut off by a wide zone of faulting known

as the "A" fault which dips at 45°S. The productive veins have not been found on the footwall side of the "A" fault where another approximately parallel fault with a slightly steeper dip occurs. This fault, known as the "valley fault", was mapped at surface in the northern part of the property as a strong sheared zone with siliceous carbonate alteration at or near the Timiskaming-Keewatin contact. The "valley fault" is the continuation of the Larder Lake "break" west of the Amikougami Creek crossfault. Underground drilling intersected green carbonates and quartz stringers with low gold values in the "valley fault".

Geological conditions at the Crescent Kirkland mine are quite similar to those at the Golden Gate mine. The rocks in the mine workings consist of Keewatin lavas intruded by irregularly shaped bodies of diorite, granodiorite, and lamprophyre. Quartz veins intersect all these formations. The vein quartz is locally mineralized with pyrite and small amounts of galena and molybdenite. The entire vein zone has been badly disturbed by a system of post-ore faults; the strongest of these strike northeast and are close to vertical. Because gold values occur along certain of these structures, either some of the movement may have been pre-ore or some gold deposition occurred later than that of the main veins.

Production

In 1910, 1911, and 1913, the Swastika mine (it later became the Crescent Kirkland) produced gold to the value of \$11,457 from 2,190 tons of ore milled. In 1941 and 1942 a small amount of ore was mined from the Crescent Kirkland section including some gold from an adit on the shore of Otto Lake south of the Crescent shaft. This gold was obtained from small rich flat-lying veins near the surface. Production from the Crescent Kirkland valued at \$42,507 was recovered from 6,288 tons of ore milled in 1947.

Total production from the combined properties of Golden Gate Mining Co. Ltd. by the company and all previous owners from 1910 until milling ceased in 1947 amounted to \$1,062,619 from 103,693 tons of ore milled. (O.D.M. Vol. LXIII, 1954, pt. 1, pp. 13, 14)

References

O.D.M. Vol. LVII, 1948, pt. 5, pp. 47-49.

O.D.M. Vol. LXIII, 1954, pt. 1, pp. 13, 14.

Report by D. K. Burke (1940) and level plans in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

The name of the company was changed to Kirkland Golden Gate Mines Ltd. in 1946. A second reorganization took place in 1950 when the company became Gateford Mines Ltd.

GOLDEN SUMMIT MINES LTD.

Location

Three claim groups were held by Golden Summit Mines Ltd. in Maisonville and Grenfell townships. The main property consisted of 3 patented claims, L.5734, L.5735, and L.4393, in the south half of lot 6, con. I, Maisonville township, and the patented north half of lot 6, con I (formerly the Jensen farm).

Chief Metal Present

Gold.

History and Development

Gold was discovered in the east half of the Jensen farm in 1916 and the Golden Summit Mining Co. was incorporated to take over the property in 1919. A pit on the discovery vein was deepened in 1921 to a depth of 27 feet. The company was reorganized in 1924 and became Golden Summit Mines Ltd. A shaft was collared 450 feet west of the old pit, and underground operations were carried on in 1929, and again from 1932 to the closing of the

mine in 1937. A small mill was installed in 1935 and it produced in 1936 and 1937. There was a clean-up of the mill in 1945. When mining ended in 1937, the shaft had been sunk to a depth of 405 feet, with levels opened at 125, 250, and 375 feet.

Geology

The property is underlain by andesitic lava flows of Keewatin age, which generally show pillow structure. These rocks are cut by dikes of Algoman lamprophyre and porphyry. Several small diabase dikes are the youngest rocks on the claims.

The shaft was sunk in the vicinity of 2 narrow east-west-trending quartz veins about 40 feet apart, the south vein being the 1916 discovery vein. Immediately east of the shaft is a strong shear zone trending north-south parallel to the strike of the flows. The east wall of the shear is a lamprophyre dike about 50 feet wide. The most important vein encountered underground was exposed in the northwest crosscut on the 125-foot level. It was a high-grade quartz vein striking east-west and varying in width from 10 inches to 2 inches. It had been intersected and displaced by a flat fault dipping to the west. The wallrocks adjacent to the vein were highly fractured, and were veined with red feldspathic material; they contained gold values.

Production

Total production amounted to 737 tons of ore from which gold was extracted to the value of \$3,738 (O.D.M. Vol. LVIII, 1949, Table II in pocket).

References

O.D.M. Vol. XXX, 1921, pt. 2, p. 27.
O.D.M. Vol. XXXI, 1922, pt. 10, p. 30.
O.D.M. Vol. XXXIX, 1930, pt. 1, p. 97.
O.D.M. Vol. XLVII, 1938, pt. 1, p. 127.
O.D.M. Vol. LV, 1946, pt. 1, facing page 10.
Reports by N. E. Odell (1927, 1930), D. R. Derry (1934), in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

The charter of Golden Summit Mines Ltd. was cancelled in 1959.

GOODFISH GOLD MINES LTD.

Location

The original property consisted of a group of 7 patented claims, and one claim held under Licence of Occupation that includes part of the east bay of Goodfish Lake in the southwest corner of Morrisette township. The claim numbers are: L.2184, L.2194, L.2195, L.2202, L.2232, L.2571, L.2603, and L.O. 39100.

Chief Metal Present

Gold.

History and Development

Gold was found in 1912 on the Costello claim (L.2194). This claim was acquired by Goodfish Lake Mines Ltd., and in 1915 a small shaft was sunk on the mineralized zone. Later the Brennan claim (L.2603), the Martin claim (L.2232), and the remainder of the claims in the group were added; the name of the company was then changed to Goodfish Gold Mines Ltd. Before closing in 1923, work on the property had been concentrated on the Martin claim (L.2232) where an inclined shaft and vertical winze had been sunk to a depth of 350 feet and considerable lateral work had been done.

In 1927 the company took over an adjoining group of 8 claims from Providence Gold Mines Ltd. and started sinking a new shaft 400 feet east of the old shaft on the "Costello" vein. When work was suspended in 1929, the shaft had reached a depth of 620 feet with levels opened at 150-foot intervals. The company was reorganized in 1933 under the name of Goodfish Mining Co. Ltd., and again in 1937 when it became Miles-Martin Kirkland Mines

Ltd. The underground workings at the Costello shaft were dewatered and examined in 1937–38, but no further work was done. In 1941 the property was optioned by Kirkland-Hudson Bay Gold Mines Ltd. following the discovery of a new zone of fracturing and mineralization trending north-east-southwest across the northeast quarter of claim L.2194 and the southwest quarter of claim L.2603. Extensive surface work on this zone and 9 diamond-drillholes produced erratic but disappointing results.

Geology

The rocks exposed at the surface of the property consisted of generally massive Keewatin basic lavas and intrusive dikes and irregular masses of Algomian quartz and feldspar porphyries. The main "Costello" vein zone lies in a strong fracture in the Keewatin lavas close to the contact with a large mass of quartz porphyry. It strikes N.55°W. and dips about 75°NE. Underground, considerable shattering was evident in the wallrocks. Narrow quartz stringers containing pyrite and molybdenite, associated with gold, occur on the hanging-wall side of the break. Along the heavily fractured zone there are also several narrow lenticular masses of quartz containing patches of low-grade material.

Sampling Results

"Workings on the 300-ft. level (of the Costello or No. 1 shaft) consist of 1700 feet of crosscutting and drifting with scattered assays up to \$12.00 per ton, but nothing consistent.

"(On the 450-ft. level) a section of drifting for 90 feet gave \$4.14, \$113.00, \$7.48, \$2.06, and \$48.00 across 2 or 3 feet.

"On the 600-ft. level 2300 feet of lateral work has been done but nothing of value reported."

Excerpts by E. J. Lees (1940) from old records.

References

O.B.M. Vol. XXV, 1916, pt. 1, p. 263.

O.D.M. Vol. XXXII, 1923, pt. 4, p. 51.

O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 152, 153.

O.D.M. Vol. XXXVIII, 1929, pt. 1, p. 107.

O.D.M. Vol. XLIV, 1935, pt. 1, p. 97.

O.D.M. Vol. XLVIII, 1939, pt. 1, p. 167.

Canadian Mines Handbook, 1957, p. 176.

Reports by E. J. Lees (1940–41) and W. T. Robson (1941) with diamond-drilling information and surface plans in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

The Ontario charter of Miles Martin Kirkland Mines Ltd. was cancelled in 1956.

GORDON LEBEL MINES LTD.

Location

The property, as outlined on O.D.M. Map. No. 53a, consists of a group of 7 patented claims straddling the south shore of McTavish Lake in the north-eastern part of Lebel township. The Bidgood Kirkland property adjoins Gordon Lebel. The claim numbers are: L.9900 (L.14680), L.9901 (L.14678), L.9902, L.12129, L.14682, L.15832, L.15833.

Chief Metal Present

Gold.

**History and
Development**

Gordon Lebel Mines Ltd. was incorporated in 1927 and took over the 7 claims previously held by Pinelle-Kirkland Mines Ltd. A geological report on the property was made by A. C. Lee in 1936. Considerable diamond-drilling was done in 1936 and 1937, which was reported by H. M. Butterfield, mine manager. A subsequent development program, planned to include

sinking a shaft to 1,000 feet, was deferred following the outbreak of war in 1939. By the end of hostilities, the company had acquired 7 additional claims, and in 1946 arrangements were made with the neighbouring Bidgood Kirkland Gold Mines Ltd. to have part of the Gordon Lebel property explored at depth from the Bidgood underground workings. Two drifts on the Bidgood 2,025-foot level were extended across the boundary and a small stope was mined out on the Gordon Lebel property before Bidgood Kirkland Gold Mines closed in 1949.

Geology

O.D.M. Map No. 53a, dated 1944, shows the Keewatin-Timiskaming contact trending S.65°E. across the centre of the property. North of the contact, the outcrops adjacent to the south shore of McTavish Lake are Keewatin volcanics and pyroclastics intruded by diorite of Algomian age. The interbanded Timiskaming rocks south of the contact are sediments, pyroclastics, and trachyte flows striking parallel to the contact. They have been intruded by feldspar and quartz porphyries of Algomian age and a later diabase dike.

Several faults are shown crossing the property. The most important of these faults is the extension of the Bidgood "break" that enters Gordon Lebel ground from the southwest. Most of the diamond-drilling in 1936-37 was done along this fault in a search for ore bodies such as occurred on it in the Bidgood Kirkland mine. The results of the drilling indicated little possibility of finding ore at comparatively shallow depths on the extension of the Bidgood fault.

Production

A small tonnage of ore from the stope above the north drift on the 2,025-foot level, which was driven from the Bidgood mine, was included in the Bidgood production figures. The stope was abandoned when the grade became too low.

References

O.D.M. Vol. XLVI, 1937, pt. 1, pp. 140, 141.
O.D.M. Map No. 53a, dated 1944.
Canadian Mines Handbook, 1947, p. 127.
Canadian Mines Handbook, 1957, p. 114.
Report by H. M. Butterfield (1937) and diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

In 1956, Gordon Lebel Mines Ltd. took over the properties and assets of Kirkland Diorite Gold Mines Ltd.

(ED.) HARGREAVES KIRKLAND GOLD MINES LTD.

Location

The property consists of a group of 5 patented claims lying northeast of the Continental Kirkland ground in the north-central part of Lebel township. The claim numbers are: L.8082, L.8083, L.8084, L.8085, L.26334.

Chief Metal Present

Gold.

History and Development

Ed. Hargreaves Kirkland Gold Mines Ltd. was incorporated in 1934 to succeed a company by the same name that had held the group of 5 claims in Lebel township since 1917. A vertical shaft had been sunk to a depth of 162 feet in 1928. At the 160-foot level, a crosscut to the vein was opened in 1934. The shaft was deepened to 300 feet in 1936, but operations came to an end in December of that year.

Geology

O.D.M. Map No. 53a, dated 1944, shows the north contact of the regional belt of Timiskaming sediments and volcanics with the older Keewatin rocks trends southeast across the west half of the property. The interbanded

sediments and tuffs roughly paralleling the contact have been intruded by Algoman feldspar porphyry. On the east claims a large mass of quartz gabbro can be seen cutting the Keewatin andesites. The north claim L.8082, which is underlain by Keewatin andesite, is bisected by a north-trending fault that may be the extension of the Heart Lake fault.

The shaft was put down in the nose of quartz gabbro extending into claim L.8084 from the west. It was apparently sunk in a carbonate zone close to the Timiskaming-Keewatin contact. Vein-material on the dump showed that the carbonate zone (chiefly ankerite) was cut by numerous irregular and narrow quartz and quartz-calcite stringers with associated disseminated pyrite. A south-dipping "vein" 8 feet wide is said to have been intersected in the shaft.

Sampling Results

According to A. MacVichie, whose father (J. A. MacVichie) was mine manager in 1936, the shaft was sunk on a well-mineralized vein running \$3.00 per ton in gold. Persistent rumours that high-grade gold was discovered underground cannot be substantiated. (Sogemines' report, 1959)

References

O.D.M. Vol. XXXVII, 1928, pt. 2, p. 159.
O.D.M. Vol. XLIV, 1935, pt. 1, p. 92.
O.D.M. Vol. XLVI, 1937, pt. 1, pp. 130, 131.
O.D.M. Map No. 53a, dated 1944.
Reports by H. D. McLeod and A. C. Amos for Sogemines Development Co. (1959), in Resident Geologist's files, Kirkland Lake.

Remarks

Charter cancelled in 1958. Claims reverted to the Crown. They were restaked in 1959 by T. V. Tamminen and associates.

HARVEY-KIRKLAND MINES LTD.

Location

The property consists of a group of 6 patented claims in Lebel township, about 2,000 feet east of the Teck-Lebel boundary and 1,500 feet south of Gull Lake. The claim numbers are: L.1872, L.1873, L.2034, L.2769, L.2770, L.7875.

Chief Metal Present

Gold.

History and Development

Harvey-Kirkland Mines Ltd. was incorporated in the spring of 1922, and shaft sinking was started in October. By the time underground development ended in 1924, the shaft was down 417 feet, and levels had been opened up at 200 feet and 400 feet. Twenty-three hundred feet of surface diamond-drilling was done in 1925. Underground operations were resumed in October 1929 and were discontinued in May 1930. Elroy Gold Mines Ltd. was incorporated in 1944 and acquired the Harvey-Kirkland property. The name of Elroy Gold was changed to Belteco Kirkland Mines Ltd. later in the same year, and additional adjoining claims were acquired.

Geology

O.D.M. Map No. 53a, dated 1944, shows the 6-claim property to be almost entirely underlain by sediments and volcanics of the Timiskaming series, interbanded; the exception is one small exposure of Algoman syenite in the southwest corner. A trachyte sill occupies most of the 3 north claims, but greywacke and boulder conglomerate predominate in the south half of the property. The strike of the bands is in general east-west, but they have been subjected to considerable faulting and folding. The "Middle Harvey fault" trending east bisects the west half of the property and there, with its subsidiaries, swings to the northeast, crossing into the Pritchard

Kirkland ground. The "South Harvey fault" is near the south boundary of the property.

The shaft was sunk on a showing near the south boundary of claim L.1873, about 150 feet south of the "Middle Harvey fault". P. E. Hopkins described the geology as follows:

"The rocks are largely Timiskaming sediments which have been highly schisted. Three veins comprising parallel veinlets of quartz with some iron pyrites occur along the bedding planes of the highly contorted sediments . . . On June 15th, 1923, the shaft was 275 feet deep with a 90-foot crosscut on the 200-foot level in altered conglomerate, greywacke, and slate, dipping 87°S."

Sampling Results

No information on record.

References

O.D.M. Vol. XXXII, 1923, pt. 4, p. 75 (P. E. Hopkins).
O.D.M. Map No. 53a, dated 1944.
Canadian Mines Handbook 1946, p. 366.

HIGHLAND-KIRKLAND MINES LTD.

Location

A group of 14 patented claims in the southeastern part of Teck township. Claim numbers are: L.1356, L.1357, L.15750, L.15751, L.15752, L.15753, L.15754, L.16550, L.16551, L.16553, L.16554, L.16555, L.16558, L.16691.

Chief Metal Present

Gold.

History and Development

Highland-Kirkland Gold Mines Ltd. was incorporated in 1920. Following a diamond-drilling program, an inclined shaft was sunk on claim L.16555 in 1923 to a depth of 100 feet. Sixty feet of crosscutting was done at that level.

Florena Gold Mines took over the property in 1936 and had a geophysical survey made. Seven drillholes were subsequently put down for a total of 7,860 feet.

Geology

The south boundary of the Timiskaming series extends east-west for about $1\frac{3}{4}$ miles near the north boundary of the property. South of the contact, the property is underlain by syenite and hybrid varieties of the Algoman intrusives with a few small remnants of Keewatin lavas. The eastern claims show numerous exposures of carbonate rocks with quartz stockworks. To the west these carbonates are partially cut out by the later syenitic intrusives. The carbonates are localized along the sheared south boundary of the Timiskaming series, which is the Larder Lake fault. This sheared zone appears to have been offset about 600 feet by crossfaulting along Murdock Creek.

Sampling Results

M. T. Barney, manager for Highland-Kirkland Mines, reported assays of a few dollars per ton in gold from a number of veins on the property. He also stated that values up to 0.15 ounces of gold per ton were encountered in the crosscut at the Highland-Kirkland shaft and that a 30-foot width of low-grade vein-matter was exposed. A few encouraging assays and several sections carrying low-grade values were reported from the earlier drilling. The drilling in 1936 and 1937, however, is reported to have revealed only values up to 0.06 ounces of gold per ton.

References

O.D.M. Vol. XXXII, 1923, pt. 4, p. 51.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 41, 42.

IROQUOIS-KIRKLAND MINES CORPORATION LTD.

Location	This company held a group of 3 patented claims in Teck township near the northeast shore of Kirkland Lake. Claim numbers as shown on Map 1945-1 are: L.2225, L.8038, L.8039.
Chief Metal Present	Gold.
History and Development	Iroquois-Kirkland Mines Corporation Ltd. was incorporated in 1920. Early work included sinking a pit 25 feet deep on a north-south-trending vein containing some mineralization on the northern part of claim L.2225. In 1934 a drillhole was put down to section the porphyry and conglomerate in the southern part of claim L.2225. Three holes in all were drilled for a total footage of 2,498 feet.
Geology	From north to south across the property, the rocks consist of intrusive diorite, pillowed lavas, and conglomerate. Syenite porphyry occurs in the extreme southeast corner of claim L.2225. Zones of schisting occur in the conglomerate.
Sampling Results	No gold values of commercial interest have been reported from explorations on the property.
References	O.D.M. Vol. LVII, 1948, pt. 5, p. 44. Report by C. L. Heath (1935) in the O.D.M. Resident Geologist's files, Kirkland Lake. Canadian Mines Handbook, 1957, p. 134.
Remarks	Ontario charter of Iroquois-Kirkland Mines Corporation Ltd. was cancelled in 1956.

KERR-ADDISON GOLD MINES LTD.

Location	The main property consists of a group of 26 patented claims and 2 fractions on the south side of the centre of McGarry township. The claim numbers are: Kerr-Addison group: L.1848, L.1849, L.1850. Reddick group: L.1749, L.1751, L.1814, L.1839, L.1840, L.1904, L.1905. Later additions: L.2018, L.2178, L.8861, L.8862, L.8863, L.27044, L.30131, L.30132, L.30133, L.30521, L.30522, L.30523, L.31160, L.31161, L.31162, L.36321. Fractions: L.30777, L.35619. The end of the northeast arm of Larder Lake occupies the southeast corner of the property.
Chief Metal Present	Gold.
History and Development	In 1904, H. L. Kerr, assistant to Dr. W. A. Parks, examined the area north of the northeast arm of Larder Lake and decided it warranted further investigation. Mr. Kerr told his findings to Dr. William Addison. In 1906, Dr. Addison visited the area and found a Dr. Reddick from Ottawa already on the ground. The Kerr-Addison and Reddick claims listed above were staked that year and were being worked in 1907. A 20-stamp mill was erected on the Reddick property in 1908. The small amount of gold recovered, valued at only \$314, was used in the first gold coins to be minted in Canada. In 1914, Associated Goldfields purchased the Reddick and Kerr-Addison claims. In addition to considerable diamond-drilling, a

shaft was sunk and lateral work was done on each property with disappointing results. Associated Goldfields became Canadian Associated Goldfields in 1921.

Kerr-Addison Gold Mines Ltd. was incorporated in 1936 and acquired the 3 Kerr-Addison and 7 Reddick claims from Proprietary Mines Ltd., a company that had previously taken over these properties from the bankrupt Canadian Associated Goldfields. An additional 16 claims were acquired at that time.

In 1936 the company carried out large-scale sampling from 4 adits driven into the hillside at the mine. Results were not satisfactory, but it was decided to drill one last deep diamond-drillhole from surface. The hole cut a wide section of gold ore. This encouragement spurred further development that outlined a large tonnage of ore, and a 500-ton mill was put into production in 1938. The mill was expanded at intervals and floatation and roasting plants were added in 1955. Maximum production was reached in 1960 when the ore milled amounted to 4,556 tons per day.

The mine is serviced by the Main or No. 3 shaft, which was sunk to a depth of 3,995 feet on the boundary line between claim L.1751 and L.1850, and an internal shaft, No. 4, extending from the 3,850-foot level to the 6,022-foot horizon.

The total length of drifts and crosscuts is more than 52 miles. Since 1959, exploration in the projected ore zone at depth has been very disappointing. To the end of 1962, no ore had been found on or below the exploration drifts on the 4,800-foot and 5,600-foot levels, and the mill-feed in 1962 was cut back to an average of 3,405 tons per day.

Geology

The Larder Lake "break", representing the faulted contact between Temiskaming sediments on the north and Keewatin volcanics on the south, is the major regional structure that influenced ore deposition at the Kerr-Addison mine. It crosses the north half of the property with a strike of N.60°E. and dips of 75°-80°N. The hanging-wall of the Larder Lake "break" is intensely sheared greywacke immediately north of a highly altered "carbonate zone" having a width of about 600 feet. The carbonate rock is thought to have been volcanic. It is totally green in some places and brown elsewhere. It contains irregular lenses of talc-chlorite schist and small irregularly shaped bodies of altered syenite intrusives. Bedded tuffs lie along the south side of the carbonate zone. Interbanded with the tuffs, and lying south of them, are basic lava flows.

The nature of the host rocks has produced 2 different types of orebodies. The carbonate type of orebodies consist of irregular lenses of auriferous quartz stockworks lying within the highly altered and brecciated carbonate zone. The gold occurs in the free state irregularly distributed throughout the quartz. Three ages of gold-bearing quartz have been recognized. The flow type of ore bodies consist of lenses of mineralized and silicified flow rock lying in the less altered bands of tuffs and flows south of the carbonate zone. The pyrite mineralization contains the bulk of the gold. It is disseminated relatively uniformly through the ore zone.

The main graphitic fault, known as the Kerr-Addison strike fault, occurs in the tuffs and flows south of the carbonate zone and is evidence of later movement within the major Larder Lake "break". The fracturing that permitted the formation of orebodies can nearly all be associated with movements along the Kerr-Addison fault and subsidiary faults. The competent rocks, coming within the influence of gentle folding or rolling of the faults, fractured at oblique angles and became the locus of ore deposition. There was post-ore underthrust movement in the Kerr-Addison fault.

The ore zone is believed to have been dropped at least 800 feet in a graben block lying between the Larder Lake "break" and the Milky Creek fault about 9,000 feet south. This post-ore movement was undoubtedly responsible to some extent for the protection of the ore-zone from subsequent erosion.

Production

Kerr-Addison Gold Mines Ltd. is Canada's largest gold producer. Total production to the end of 1962 amounted to \$256,745,022 from 28,516,503 tons of ore milled. (Figures supplied by O.D.M. Statistician.)

References

O.B.M. Vol. XVIII, 1909, pt. 1, pp. 130, 131.
O.D.M. Vol. XXXIII, 1924, pt. 3, p. 23.
O.D.M. Vol. L, 1941, pt. 7, pp. 64-75.
Canadian Mining Journal, Kerr-Addison issue, April 1951.
Structural Geology of Canadian Ore Deposits, Vol. II. Canadian Inst. Min. Met., Geology Division, 1957, pp. 392-402.
Financial Post Survey of Mines, 1959, p. 178.
Canadian Mines Handbook, 1962, pp. 131, 132.
Kerr-Addison Gold Mines annual report for 1962.

Remarks

Kerr-Addison Gold Mines Ltd. is active in outside exploration. The company acquired the adjoining Chesterville property in 1957. The Chesterville mine, which had some orebodies in common with Kerr-Addison, closed in 1952.

KING KIRKLAND GOLD MINES LTD.

Location

The property consists of a group of 10 patented claims near the centre of Lebel township. The village of King Kirkland on highway No. 66 occupies most of claim L.2440 in the north part of the property. The claim numbers are: L.S.108, L.2440, L.2441, L.2910, L.2992, L.4117, L.4118, L.8001, L.8002, L.9893.

Chief Metal Present

Gold.

History and Development

The claims were staked in 1918 following the discovery of gold on the property and the company was incorporated in 1920. During the next 3 years an inclined shaft was sunk in the southwest corner of claim L.8002, and 2 levels were opened up at 90 feet and 400 feet. The property was optioned to Tonopah Mining Co. early in 1923, and additional lateral work was done on the 400-foot level. The option was dropped at the end of the year, and the mine closed.

The company was reorganized in 1936, and the name was changed to Kircking Gold Mines Ltd. The old workings were resampled, and some diamond-drilling was done. The charter of Kircking Gold Mines Ltd. was surrendered in 1938, and the property again became King Kirkland Gold Mines Ltd.

Geology

The 2 north claims, L.2440, L.2441, are almost entirely drift-covered. The remaining part of the property, as shown on O.D.M. Map No. 53a dated 1944, is bisected by a narrow band of drift and swamp trending slightly south of east along the Ontario Northland Railway. Between the railway and highway No. 66 on the north, all the outcrops are classified as Algoman "porphyrite", a term including porphyry and those parts of the intruded country rock that have been porphyritized to such an extent that no definite contacts exist between them and the intrusive. South of the railway, the claims are underlain by interbanded sediments, volcanics, and pyroclastics of Timiskaming age; these rocks strike east-west and are cut by a north-south-trending cross fault. Another fault trending north of

east, which may be the westerly extension of one branch of the Bidgood fault, is shown cutting across the porphyrite north of King Lake. Surface exploration in the early 1920s resulted in the discovery of over 30 narrow parallel veins with a northeasterly strike and steep northwesterly dip in the porphyrite east of King Lake. The shaft was sunk on the No. 5 vein of this series where it was exposed in the southern part of claim L.8002. The veins occur in fractured zones in the porphyrite and few of them have a width of more than a few inches although rare widths up to 6 inches do occur. They consist for the most part of fillings of granular white quartz, calcite, barite, and iron carbonates, with narrow contact zones of silicified and pyritized wallrock.

Sampling Results

Sampling of the No. 5 vein in the shaft gave a gold value of \$34.00 across 14 inches at a depth of 60 feet. At 90 feet the vein assayed \$28.00 across 2 feet. (E. Craig, 1921)

In 1937, resampling of the more promising parts of the vein followed the dewatering of the old workings. . . . On the 90-foot level the sampling failed to show ore of mineable grade. . . . In the drift on the 400-foot level, although high values were returned for a few samples, the sections sampled would not make ore over mineable widths. (E. G. Gillanders, 1937)

References

O.D.M. Vol. XXXII, 1923, pt. 4, pp. 70-72.
O.D.M. Vol. XLVI, 1937, pt. 1, pp. 154, 155.
O.D.M. Map No. 53a, dated 1944.
Reports by E. Craig (1921) and E. G. Gillanders (1937), diamond-drilling information and sample plans, etc., in O.D.M. Resident Geologist's files, Kirkland Lake.

KIRANA KIRKLAND GOLD MINES LTD.

Location

This company held a group of 7 patented claims in the northeast corner of Teck township and the northwest corner of Lebel township. Claim numbers, as shown on O.D.M. Maps No. 1945-1 and No. 53a, are:
Teck township: L.1686, L.1687, L.1688, L.1751.
Lebel township: L.1619, L.1749, L.1750.

Chief Metal Present

Gold.

History and Development

Kirana Kirkland Gold Mines Ltd. was incorporated in 1936 and succeeded La Belle Kirkland Mines Ltd. An inclined shaft was sunk to a depth of 300 feet on claim L.1751 in 1916 by La Belle Kirkland Mines. It was subsequently deepened to 360 feet, and 1,150 feet of lateral work was done on the 100- and 250-foot levels.

The mine was dewatered in 1936 by Kirana Kirkland Gold Mines; in 1937, the shaft was reconditioned, and 820 feet of crosscutting was done.

Geology

The greater part of the claim group is underlain by intermediate and basic volcanics intruded by dikes and small irregular bodies of quartz porphyry. O.D.M. Map No. 1945-1 shows diorite occurring on the two western claims in Teck township. On O.D.M. Map No. 53a, a small outlier of Timiskaming conglomerate is shown resting unconformably on the Keewatin lavas in the southeast corner of the claim group.

Burrows and Hopkins described the deposit as occurring on a contact which dips 60°-70°N. between quartz porphyry and altered basalt. The porphyry forms the hanging wall of the deposit. The basalt near the contact is greatly altered to a greyish rock high in silica, calcite, and other

carbonates; it is in this zone that streaks or bands of blackish material form the higher-grade portion of the deposit. These streaks contain films of molybdenite, to which the dark colour is due, and abundant iron pyrite, quartz, and calcite, with occasional specks of visible gold. The high-grade streaks vary from a fraction of an inch to a foot in width and low gold values occur in the intervening silicified material.

Sampling Results The narrow high-grade streaks or bands are reported to carry from \$20.00 to \$150.00 per ton in gold, and a probable value of \$15-\$18 per ton is given for a width of 7 feet to 10 feet, for some of the ore (Burrows and Hopkins 1916).

References O.D.M. Vol. XXV, 1916, pt. 1, p. 262.
O.D.M. Vol. LVII, 1948, pt. 5, p. 44.
Canadian Mines Handbook, 1937.

Remarks The charter of Kirana Kirkland Gold Mines Ltd. was cancelled in 1954.

KIRGOOD GOLD MINES LTD.

Location The property consisted of a group of 11 patented claims east of the Continental Kirkland ground in the north half of Lebel township. The claim numbers were: L.2078, L.2079, L.8668, L.8669, L.8680, L.8681, L.8682, L.9090, L.9250, L.9413, L.9414.

Chief Metal Present Gold.

History and Development Kirgood Gold Mines Ltd. was incorporated in 1936, and then acquired the property previously known as the D. A. McPherson or Thackerey claim group. Early work on the claims consisted of surface trenches and pits on claim L.9250 and the sinking of a shaft to a depth of 40 feet on the Murdock Creek fault in the south half of claim L.8680. In 1937, four diamond-drillholes totalling 2,400 feet were completed, and in 1939 the surface pits and shaft were dewatered and sampled.

Geology O.D.M. Map No. 53a, dated 1944, shows interbanded Timiskaming sediments and volcanics occupying most of the west half of the property; the east half, which is largely swamp covered, is underlain by Keewatin volcanics and pyroclastics intruded by diorite on the north boundary. The contact between the Timiskaming and Keewatin rocks is considerably crossfaulted but, in general, trends northwest-southeast across the property. The chief structural feature is the Murdock Creek fault. This fault strikes across the north half of Lebel township at N.60°E. and forms the long axis of the Kirgood property. It was exposed in the shaft on claim L.8680 as a strong mud-seam dipping 80°N. In 1937, diamond-drillholes No. 1 and No. 3 intersected the Murdock Creek fault at depths of 200 and 300 feet respectively, and also encountered a narrow zone of shearing and pyrite mineralization about 150 feet north of the fault. Hole No. 4 was drilled under the vein occurring in a mineralized shear zone with a N.70°E. strike on claim L. 9750.

Sampling Results Few gold values of commercial grade were obtained.

References O.D.M. Vol. XLVI, 1937, pt. 1, p. 61.
O.D.M. Map No. 53a, dated 1944.
Reports by Mining Research Corporation Ltd. (1936-39), Nelson Hogg (1950), and other reports, with diamond-drilling information, geological maps, etc. in Resident Geologist's files, Kirkland Lake.

Remarks The charter of Kirgood Gold Mines Ltd. was cancelled in 1960.

KIRKLAND BASIN GOLD MINES LTD.

Location	Most of the property underlies Kirkland Lake in Teck township. As shown on Map No. 1945-1 it consisted of 4 patented claims adjoining the property of Lake Shore Mines on the north. The claim numbers were: L.1754, L.2832, L.3301, L.3442.
Chief Metal Present	Gold.
History and Development	<p>Kirkland Basin Gold Mines Ltd. was incorporated in 1931, and was controlled by Kirkland Lake Gold Mining Co. Ltd. Part of the property was acquired from Pawnee-Kirkland Gold Mines Ltd. Considerable surface diamond-drilling was done before the property was optioned to Lake Shore Mines Ltd. in 1938. The agreement called for Lake Shore to drive a crosscut north through the property from the 3,075-foot level of the Lake Shore mine.</p> <p>The annual report of Lake Shore Mines Ltd. for the year ending 30 June 1940 listed 2,402 feet of crosscutting, 712 feet of drifting, and 12,049 feet of diamond-drilling performed on the Kirkland Basin property. A summary of the results stated that a number of gold-bearing fractures were exposed; because the values encountered were erratic, no ore was developed.</p>
Geology	The crosscut driven by Lake Shore on the 3,075-foot level penetrated conglomerates and tuffs of the Timiskaming series trending north of east. The sediments are cut by dikes and sills of augite syenite and later quartz and feldspar porphyries. Near the north boundary of the sedimentary series the crosscut passed through a sheared and carbonated zone containing quartz veins. All the above-mentioned rocks are cut by a narrow north-trending diabase dike that has been step-faulted.
References	Canadian Mines Handbook, 1940, p. 110. O.D.M. Vol. LVII, 1948, pt. 5, p. 45.
Remarks	The property reverted to the Crown in 1960.

KIRKLAND GATEWAY GOLD MINES LTD.

Location	The property consists of a group of 11 patented claims in the southwestern part of Teck township, in the vicinity of Elsie Lake about a mile west of the Macassa mine. The claim numbers, as shown on O.D.M. Map No. 1945-1, are: L.6822, L.7711, L.16509, L.16510, L.16511, L.16512, L.16513, L.16514, L.16515, L.16545, L.16546.
Chief Metal Present	Gold.
History and Development	<p>Kirkland Gateway Gold Mines Ltd. was incorporated in 1922 and acquired the former Lucky Cross mine at Swastika. During 1922 and 1923 a program of diamond-drilling and underground development was carried out. Kirkland Gateway turned over the Lucky Cross property to the Golden Gate Mining Co. Ltd. in 1934.</p> <p>The Elsie Lake claim group was explored by surface work and diamond-drilling in 1937 and 1938. Twenty-seven holes, for a total of 15,281 feet, were completed. This work showed that a fault, apparently the westerly continuation of the main Kirkland Lake break, extends across the property. It is marked by strong shearing and alteration, and in some cases by a pronounced mud seam.</p>

- Geology** The rocks on the property consist principally of Timiskaming tuff, greywacke, and conglomerate, intruded in places by narrow dikes of syenite porphyry, basic syenite, and lamprophyre. On the northern claims, the outcrops are predominantly jasper-bearing conglomerate. The contact between the conglomerate and the tuff to the south is indistinct owing to interbanding of the 2 rock types in the transition zone. The dikes strike about N.60°E. with an average dip of about 60°S.
- The most interesting structural feature of the property is the above-mentioned fault zone. It is exposed on an outcrop on claim L.6822 and contains sparsely mineralized quartz in a brecciated porphyry. Throughout most of the drilled area, sediments occur on both walls of the fault, but sometimes they are of different composition.
- Sampling Results** Five of the drillholes cut fine-grained pyrite mineralization and veining in the fault zone. The mineralization occurs in altered conglomerate in association with quartz and carbonate stringers. Gold values in this material ranged from 0.04 ounce per ton over 3.5 feet of core to 0.14 ounce per ton over 1.2 feet. A mineralized gold-bearing zone plunging westward and having a length of 250–300 feet was indicated.
- References** Canadian Mines Handbook, 1937, p. 332.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 45–47.
- Reports by B. S. Buffam (1937), W. T. Boyes (1937), E. R. Fockler (1938), and diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

KIRKLAND GOLD RAND LTD.

- Location** A group of 8 patented claims in Teck township in the southeastern part of the town of Kirkland Lake. The claim numbers as shown on O.D.M. Map No. 1945-1 are: L.2678, L.2679, L.5941, L.6678, L.6679, L.6680, L.6681, L.6682.
- Chief Metal Present** Gold.
- History and Development** Kirkland Gold Rand Ltd. was organized in 1931. It succeeded Kirkland-Premier Mines Ltd. Part of the ground was developed in the early days of the camp by Ontario Kirkland Gold Mines Ltd.; and later by Montreal Ontario Mines Ltd. and Kirkland Rand Ltd. Ontario Kirkland Gold Mines deepened an old shaft on claim L.2679 to a depth of 450 feet and did lateral work on 3 levels. When underground operations ceased at the Kirkland Gold Rand property in December 1937, five levels had been opened to a depth of 800 feet and a winze had been sunk to the 1,425-foot level from the 800-foot level, 900 feet east of the main shaft. The lateral work amounted to a total of 14,350 feet, and more than 11,000 feet of underground diamond-drilling had been done.
- Hudson-Rand Gold Mines Ltd. was incorporated in 1944 and acquired the Kirkland Gold Rand property; it reopened the mine in September 1946. The 675-foot and 800-foot levels were resampled and about 1,400 feet of lateral work was done before the mine closed in May 1947. An agreement was made by Hudson-Rand with Lake Shore Mines Ltd. in 1951 for exploration of the property at depth from a crosscut on the 6,575-foot level of Lake Shore mine, which had been driven south across the greater part of the intervening Kirkland-Hudson ground. This crosscut from Lake Shore was extended into the Hudson-Rand (Kirkland Gold Rand) property for 902 feet before operations ended in April 1952.

Geology

The rocks on the northern part of the property consist of sediments and tuffs intruded by irregularly shaped bodies of syenite porphyry. The southern section is underlain by basic volcanics, tuffs, sediments, and carbonates intruded by syenite and syenite porphyry.

The rocks within the area of the mine workings consist of Timiskaming sediments intruded by syenite porphyry. Most of the known gold-bearing zones are in the syenite porphyry where the veins strike east-west and dip steeply to the north. They consist of quartz stringers occurring in fracture zones in the porphyry and accompanied by pyrite and chalcopyrite. The gold appears to be associated with these minerals since native gold was rarely seen.

A number of faults, striking N.55°E.-N.65°E., are shown crossing the property on O.D.M. Map No. 1945-1. Crossfaults, known to occur in the Wright-Hargreaves and Sylvanite mines, apparently continue southward through the Kirkland Gold Rand claims.

**Production,
Ore Reserves**

Production from a 100-ton mill by Ontario Kirkland Gold Mines in 1922 amounted to \$10,082 from 6,496 tons of ore milled.

E. J. Lees, mine manager for Hudson-Rand, stated in 1947 that above the 800-foot level, assuming an expected continuity of ore between levels, a minimum stoping width of 36 inches, and a dilution of 15 percent, there was room to justify expectations of about 45,000 tons of \$8 grade. He emphasized that this estimate was only an expectation and that no ore had definitely been blocked out by raising.

References

O.D.M. Vol. XXXII, 1923, pt. 1, pp. 5, 6.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 42-44.
Some assay results in O.D.M. Resident Geologist's files, Kirkland Lake.
Canadian Mines Handbook, 1958, p. 127.

Remarks

Hudson-Rand Gold Mines Ltd. was renamed Hudson Rand Mines Ltd. in 1956 and became Canorama Explorations Ltd. in 1957.

KIRKLAND-HUDSON BAY GOLD MINES LTD.**Location**

A group of 6 patented claims in the eastern part of Teck township, adjoining the property of Lake Shore Mines Ltd. A considerable part of Kirkland Lake townsite is built on the property. The claim numbers are: L.1403, L.1404, L.2553, L.2566, L.2672, L.2557.

Chief Metal Present

Gold.

**History and
Development**

Kirkland-Hudson Bay Gold Mines Ltd., controlled by Hudson Bay Mines Ltd., was incorporated in 1919. Mining claims L.2553 and L.2566 in Kirkland Lake, owned by Hudson Bay Mines, were transferred to Kirkland-Hudson Bay Gold Mines.

Between 1926 and 1928, surface-trenching and diamond-drilling revealed some veins, and 2 long holes were drilled into the property from the east end of the drift on the 1,000-foot level on the Lake Shore south vein. In 1933 a crosscut from the east drift on the 2,700-foot level of Lake Shore mine was extended 500 feet into Kirkland-Hudson Bay ground. About 200 feet south of the boundary a 6-foot vein was cut. This vein gave encouraging values but no ore shoot was developed. In 1938 a crosscut from No. 1 vein on the 4,450-foot level of the Lake Shore mine was driven to within 640 feet of the south boundary of the property and diamond-drillholes were extended the remainder of the distance. A number of veins and breaks carrying low values were found.

Kirkland-Hudson Bay Gold Mines Ltd. made an agreement with Kirkland Gold Rand Ltd. in 1944 whereby a new company, Hudson-Rand Gold Mines Ltd., was formed to develop the neighbouring Kirkland Gold Rand property.

In 1956 the name of Kirkland-Hudson Bay Gold Mines was changed to Kirk-Hudson Mines Ltd., and the possibility of further exploration of the property from deep levels in the Lake Shore mine was considered, but priority was given to investigating new properties elsewhere.

Geology

The greater part of the property is underlain by Timiskaming greywacke and conglomerate. Southeast of these sediments a narrow band of tuff of the same age trends in a northeasterly direction. The Timiskaming rocks are cut by syenite porphyry dikes, and on the northwest there are patches of augite syenite on the Lake Shore-Kirkland-Hudson Bay boundary. Several north-south faults, known to offset veins in the producing mines, cross the Kirkland-Hudson Bay ground. The Murdock Creek fault dips northwest and crosses the southeast corner of the property at the surface where it appears to occur on the footwall of the above-mentioned band of tuff. This fault is known to offset orebodies in the Wright-Hargreaves mine.

References

O.D.M. Vol. LVII, 1948, pt. 5, pp. 49, 50.
Geological plan in O.D.M. Resident Geologist's files, Kirkland Lake.
Northern Miner, 17 May 1956.

Remarks

Kirk-Hudson Mines Ltd. succeeded Kirkland-Hudson Bay Gold Mines in 1956. It was reorganized in 1958, and the name was changed to Northgate Exploration Ltd.

KIRKLAND LAKE GOLD MINING CO. LTD.

Location

The main property consists of a group of 6 patented claims lying between the Teck-Hughes property on the east and the Macassa property on the west. The claim numbers are: L.1236, L.1643, L.1850, L.2604, L.2644, L.2771.

Chief Metal Present

Gold.

History and Development

C. A. McKane staked one claim (L.1236) in the spring of 1911. This claim was destined to become the site of the producing mine. The original discovery vein later proved to be part of the main vein-fault of the camp. It was exposed in 1912 in a deep trench near the Teck-Hughes (Orr) boundary on its projection from workings on that property. The McKane claim was incorporated as Kirkland Gold Mines Ltd. in 1913 and a shaft was sunk to 80 feet. The property was then taken over by Beaver Consolidated Mines Ltd. and the shaft was deepened to 600 feet. Beaver Consolidated formed the Kirkland Lake Gold Mining Co. in 1915 and a second shaft, which became the main shaft, was started southwest of No. 1 shaft near the centre of the claim. Production started from a 150-ton mill in 1919. The property consisted of only one claim (L.1236) until 1929 when the company purchased the adjoining Chaput Hughes claim (L.2644) on the south. The remaining 4 claims, known as Grozelle Kirkland Gold Mines, were taken over in 1936.

The mine has been explored and developed on 61 levels by 2 shafts and 4 winzes. The No. 4 winze took the workings to a depth of 6,003 feet. With the exception of the year 1925, when the property was under option to the Anglo French Exploration Co., production was continuous from 1919 until operations ceased in 1960, and reached a maximum in 1940 when 137,986 tons of ore yielded gold to the value of \$2,051,790. Mining rights on the

property were purchased by the neighbouring Teck-Hughes Gold Mines Ltd. after the mine closed.

Geology

The rock formations on the surface of the property are shown on O.D.M. Map No. 1945-1. The 2 main groups of rocks are the older sediments and later intrusives. The sediments consists of conglomerate, greywacke, and tuffs of the Temiskaming series. These sediments are intruded by augite syenite, syenite, syenite porphyry, and quartz-feldspar porphyry of Algoman age, and also a younger diabase. Ore is found in all the formations except the diabase.

On the surface, the Kirkland Lake main vein-fault follows the north contact of a sill-like mass of augite syenite, with boulder conglomerate to the north and tuff along the south contact. The body of augite syenite widens somewhat with depth. It has been intruded in the upper part of the mine by a westward-pitching irregular pipe-like body of red syenite outcropping on the Teck-Hughes property, crossing the Kirkland Lake Gold claims, and continuing into the Macassa mine.

This pitching body of syenite has been sliced into 2 parts through its long dimension by the Kirkland Lake fault; the southern or hanging-wall part has been thrust upward roughly 1,500 feet.

Syenite porphyry intrudes both the syenite and the augite syenite and increases in amount with depth. Conglomerate, greywacke, and tuff occur in a pitching anticlinal structure in the lower part of the mine whose core is syenite porphyry and quartz-feldspar porphyry.

The most important structure is the Kirkland Lake vein-fault. This fault crosses the entire property and has an over-all dip of about 75°S. from surface to the bottom of the workings. In the upper half of the mine, the productive veins were found chiefly in the 2 faulted parts of the syenite body in the zone of fracturing.

Below the 3,400-foot horizon, the veins occur in a different environment. No. 6 "break" branches from the main fault with a flatter dip, thus forming a split structure straddling the pitching anticlinal structure. Productive veins occurred in the folded tuff and sediments of this structure and in the wedge-shaped block above, bounded by the main fault and the No. 6 break. The vein in the latter was not very productive; in contrast, the No. 5 vein, lying above the No. 6 "break" and more or less parallel to it, was an important source of ore.

There is little post-ore faulting in the upper part of the mine but, at depth, some of the veins have been displaced a small amount.

Production

Total production from Kirkland Lake Gold Mining Co. Ltd., from 1919 to 1960 inclusive amounted to \$39,124,929 from 3,141,051 tons of ore milled. (Figures supplied by O.D.M. statistician.)

References

O.D.M. Vol. XXIX, 1920, pt. 4, pp. 26-29.
O.D.M. Vol. XXXII, 1923, pt. 4, pp. 29-31.
O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 93-98.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 133-140.
O.D.M. Vol. LXX, 1961, pp. 37-39.

Structural Geology of Canadian Ore Deposits, Vol. I, Canadian Inst. Min. Met., Geology Division, 1948, pp. 644-653.

"Three Miles of Gold" by S. A. Pain. The Ryerson Press, Toronto.

Remarks

Kirkland Lake Gold Mining Co. Ltd. was reorganized in 1956 and the name was changed to Kirkland Minerals Corporation Ltd.

KIRKLAND TOWNSITE GOLD MINES LTD.

Location	The property consisted of 3 patented claims located within the town of Kirkland Lake and south of the Wright-Hargreaves mine. The claim numbers are: L.1438, L.1635, L.2192.
Chief Metal Present	Gold.
History and Development	<p>Kirkland Townsite Gold Mines Ltd. was incorporated in 1917. Anglo-Canadian Explorers Ltd. had the property under option in 1924. From a shaft 317 feet in depth, lateral work was done on the 150-foot and 300-foot levels. Underground operations were resumed in 1926. By the end of 1927 the shaft had been deepened to 695 feet and a new level established at 675 feet. From this station a long crosscut was driven into the south part of the property. A considerable amount of diamond-drilling was done from the surface and from the various underground levels. A long hole was also extended into the property from the drift at the 1,250-foot level in the Wright-Hargreaves mine.</p> <p>In 1931 the shaft was enlarged from 2 to 3 compartments to a depth of 150 feet. Between 1931 and 1956 the mine lay dormant. In 1956 an agreement was made with Wright-Hargreaves that any ore extending from that mine into the ground of Kirkland Townsite Gold Mines Ltd. would be mined by Wright-Hargreaves, and that 25 percent of the net profit from it would go to Kirkland Townsite. This agreement was terminated by Wright-Hargreaves early in 1960.</p>
Geology	The large mass of syenite porphyry extending east from the Lake Shore mine through Wright-Hargreaves and Sylvanite to the Toburn property also occupies most of the north quarter of the ground of Kirkland Townsite Gold Mines Ltd. The remainder of the property is underlain by greywacke of Timiskaming age cut by dikes of the syenite porphyry. O.D.M. Map No. 1945-1 shows several north-south post-ore faults extending from Wright-Hargreaves across the property.
Production	<p>To the end of April 1959 a total of 4,460 tons of ore had been mined by Wright-Hargreaves from the property of Kirkland Townsite Gold Mines Ltd. The average grade was about \$9 per ton.</p> <p>Before the agreement between the 2 companies ended in 1960, Wright-Hargreaves mined an additional 1,970 tons averaging about $\frac{1}{8}$ ounce of gold per ton from the extension of the Wright-Hargreaves south vein-system into the ground of Kirkland Townsite Gold Mines Ltd.</p>
References	<p>O.D.M. Vol. XXXVII, 1928, pt. 1, p. 121. O.D.M. Vol. LVII, 1948, pt. 5, p. 50. Northern Miner, 9 February 1956, 14 April 1960.</p>
Remarks	Kirkland Townsite Gold Mines Ltd. continues as an investment and holding company. All surface rights not required for mining have been sold.

KIRKROYALE GOLD MINES LTD.

Location	The property consisted of 6 patented claims near the centre of Lebel township. The ground lies between the Lakeside Kirkland property on the west and the King Kirkland property on the east. The claim numbers are L.2037, L.2295, L.2296, L.2297, L.3685, L.3686.
Chief Metal Present	Gold.

History and Development

The property was first developed by Kirk Gold Mines Ltd., a company incorporated in 1916. By the end of 1925 a shaft had been sunk on claim L.3686 and about 1,700 feet of lateral work had been done on the 300-foot level. The company was reorganized in 1926 and became Conroyal Mines Ltd. The shaft was deepened to 565 feet; a winze located 440 feet south and 180 feet west of the shaft was put down from the 550-foot level to a depth of 1,115 feet. Several levels were opened, but most of the development work was confined to the 300- and 500-foot levels until the mine closed in 1928. In 1934 the name of the company was changed to Conroyal Gold Mines Ltd. Kirkroyale Gold Mines Ltd. was incorporated in 1937 to succeed Conroyal Gold Mines Ltd. In that year the underground workings were dewatered and sampled. The results were disappointing and once more the mine closed. About 500 feet of diamond-drilling from surface was done during the winter of 1949-50.

Geology

The O.N.R. (formerly the Nipissing Central Railway) crosses the centre of the property from east to west. O.D.M. Map No. 53a, dated 1944, shows the most recent interpretation of the geology. The area north of the railway is largely drift-covered. The few existing scattered outcrops suggest that this area is chiefly underlain by "porphyrite", a term used to describe intrusive porphyry and those parts of the intrusive country rock that are porphyritized to such an extent that no definite contacts exist between them and the intrusive. Porphyry of Algoman age intruded the Timiskaming sediments and pyroclastics; the "porphyrite" lies between tuff to the north and conglomerate to the south. Alternating bands of Timiskaming sediments, volcanics, and pyroclastics occur south of the railway. These extend east into the neighbouring King Kirkland property. The shaft was sunk on a vein in an outcrop of fine-banded greywacke 190 feet south of the railway.

The fault, trending slightly south of west across the King Kirkland property north of King Lake, crosses north claims of Kirkroyale. This fault may be the westerly extension of one branch of the Bidgood fault. West of the mine workings on claim L.3686, a fault trends northeast, and another parallel fault is shown cutting across the west claim of the group.

According to E. W. Todd, the underground operations were confined principally to the exploration of a (quartz) vein that follows the north contact of the lava flows (trachyte) with conglomerate. This vein is described as an irregular structure dipping to the south at 80°; the wallrocks are highly altered and impregnated with carbonates and fine pyrite.

Sampling Results

No records available.

References

O.D.M. Vol. XXXII, 1923, pt. 4, p. 72.
O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 157, 158.
O.D.M. Vol. XLVII, 1938, pt. 1, pp. 147, 148.
O.D.M. Map No. 53a, dated 1944.

Diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

The charter of Kirkroyale Gold Mines Ltd. was cancelled in 1959. The claims were restaked by G. E. Harrison, former president of the company, and several surface holes were drilled.

LAGUERRE GOLD MINES LTD.

Location

The property consists of a group of 14 patented claims and a small fraction straddling the boundary line between McVittie and Hearst townships and

taking in part of the town of Larder Lake. The claim numbers are: H.F.93, H.F.94, H.F.183, L.316, L.514, L.879, L.880, L.881, L.1009, L.1053, T.2143, L.5360, L.7094, L.33209.

Chief Metal Present Gold.

History and Development

Laguerre Gold Mines Ltd. was incorporated in 1939. It acquired the claim group by the purchase of the entire property and plant of Raven River Gold Mines Ltd., 2 adjoining claims from Proprietary Mines Ltd., and claim L.1053 from Knutson Mining Corp. Ltd. Raven River Gold Mines was organized in 1934 and took over 11 claims that included the old Harris-Maxwell property, one of the earliest producers in the Larder Lake area. A 10-stamp mill was built in 1908. The Harris-Maxwell property was acquired by Associated Goldfields Mining Co. Ltd., and in 1913 a shaft was sunk to a depth of 438 feet with subsequent lateral work on 5 levels. Raven River Gold Mines sank a winze from the 450-foot level and opened up 2 additional levels before closing in 1939. Diamond-drilling by Laguerre Gold Mines on the Knutson claim (L.1053) during 1939-40 gave poor results, but in the winter of 1940-41 a possible ore shoot was found by drilling on claim L.879, adjoining the Knutson claim. A shaft was sunk in the south half of this claim to a depth of 781 feet, lateral work was done on 4 levels. The mine closed in 1947.

Geology

The rocks on the Knutson claim, L.1053, and on the adjoining claim, L.879, are a complex assemblage of different types. Timiskaming sediments, chiefly conglomerate with tuffs and highly schistose rocks, are intersected by a great number of dikes and irregularly shaped intrusive bodies of Algoman age. The main intrusives are syenite, felsite, diorite, and lamprophyre.

The Laguerre shaft was sunk on the north extension of the No. 2 vein-zone on the Knutson ground. This vein-zone lies within the boundaries of a pink syenite dike. Drill holes traced the dike for more than a quarter mile, and showed that its width varies from 3 to 75 feet. Values in gold occur throughout the dike on the 250-foot level where it has been fractured, pyritized, and cut by quartz stringers, but no ore shoot could be outlined.

In the Raven River (Harris-Maxwell) mine, the ore occurred in quartz veins in 2 pipe-like bodies of greatly altered syenite. The rocks bordering the syenite bodies are green carbonate, talc-chlorite, greenstone, and lamprophyre.

Production

There was a small production from the property in 1913 from ore put through the mill from shaft-sinking.

In 1937-39 the Raven River mine produced 40,514 tons of ore valued at \$226,441. (O.D.M. Vol. XLIX, 1940, pt. 1, p. 14)

No production is recorded from the Laguerre mine.

References

O.B.M. Vol. XXVIII, 1919, pt. 2, pp. 74, 75.

O.D.M. Vol. XXXIII, 1924, pt. 3, pp. 24, 25.

O.D.M. Vol. XLIX, 1940, pt. 1, p. 192.

O.D.M. Vol. L, 1941, pt. 7, pp. 76-80.

President's report (1947) and level plans in O.D.M. Resident Geologist's files, Kirkland Lake.

Canadian Mines Handbook, 1951, pp. 137, 138.

Canadian Mines Handbook, 1956, pp. 48, 49, 182.

Remarks

The company's name was changed to New Laguerre Mines Ltd. in 1950. After another reorganization in 1956, it became Can-Erin Mines Ltd.

LAKE BEAVERHOUSE MINES LTD.

Location	Large group of claims straddling the northern part of the boundary line between Gauthier and McVittie townships.
Chief Metal Present	Gold.
History and Development	<p>The property includes the old Argonaut mine that was in intermittent production from 1919 to 1935. The history of this mine dates back to 1912 when a gold discovery on the west shore of Beaverhouse Lake was developed for some time by La Mine D'Or Huronia. When the Argonaut mine closed, the workings consisted of a shaft to the 500-foot level, a winze from the 500-foot to the 1,250-foot level, and crosscutting and drifting on 10 levels.</p> <p>Toburn Gold Mines, a subsidiary of the Premier Gold Mining Co. Ltd. financed by American Smelting and Refining Co., resumed underground operations on the upper levels in 1937-39. Before the mine was closed in 1939, further work was done by Ventures Ltd. The name of the property was changed to Lake Beaverhouse Mines Ltd. in 1950 and more diamond-drilling from surface was done in 1951.</p>
Geology	<p>The main rock types in the general vicinity of the mine are fine-grained basic lava, coarse- to medium-grained greenstone, acid lava, cherty banded tuffs, and intrusive hornblende syenite and syenite porphyry.</p> <p>Veins south of the shaft on all levels to a depth of 500 feet were discovered and developed by Toburn and Ventures in 1937-39, but their vertical continuity was not established. These veins occur in fine-grained lavas, coarse-grained greenstone, and syenite porphyry. They are quartz or sulphide fillings in narrow north-trending shear zones.</p>
Ore Reserves	Estimated in 1951 to be 51,200 tons averaging $\frac{1}{3}$ ounce of gold per ton. The ore contains 0.8 percent copper.
Production	The value of the gold recovered from 131,585 tons of ore was reported to have been \$799,759.
References	<p>O.D.M. Vol. XLIX, 1940, pt. 1, p. 14. O.D.M. Vol. L, 1941, pt. 8, pp. 16-18.</p> <p>Reports by D. R. Derry (1939), diamond-drilling information and geological plans in O.D.M. Resident Geologist's files, Kirkland Lake. Canadian Mines Handbook, 1961, p. 131.</p>
Remarks	Lake Beaverhouse Mines Ltd. was reorganized in 1961. During that year considerable surface diamond-drilling was done under the management of Augustus Exploration. In 1962 some underground development and diamond-drilling was done before operations were suspended.

LAKE SHORE MINES LTD.

Location	<p>The property is centrally located among the 7 producing mines of Kirkland Lake. It originally consisted of 4 patented claims and 4 fractions as follows: Claims: L.1557, L.2605, L.2606, L.2645. Fractions: L.2242, L.2243 (two fractions), and L.3601. Four additional claims (Minaker) to the south were acquired at later dates. Their numbers are: L.16633, L.16634, L.16635, L.16726.</p>
Chief Metal Present	Gold.

History and Development

Gold was first found on the property by Harry Oakes in 1911 shortly after W. H. Wright made the original discovery of gold in the Kirkland Lake camp. Oakes added to his holdings in 1913 by purchasing the Minaker claim L.16635 that contains the western half of the Lake Shore mine. He started sinking No. 1 shaft in 1914 on the discovery vein in the north-western part of claim L.1557 adjoining claim L.16635 to the east. This No. 1 vein was later to be known as the South vein. There was no surface indication of the more important North or No. 2 vein lying beneath the lake; but Oakes suspected it was there as a continuation of the main vein on the neighbouring Wright property to the east.

Lake Shore Mines Ltd. was organized and incorporated in 1914 by Harry Oakes and the No. 1 shaft was sunk to the 400-foot level. A cross-cut to the north confirmed the presence of the North or No. 2 vein. Development work on both the North and South veins was encouraging and by 1918 gold production started with an initial mill capacity of about 60 tons per day. The mill was gradually enlarged until a capacity of 2,400 tons per day was attained. In 1934 the 3 remaining claims belonging to Minaker Kirkland Gold Mines Ltd. were acquired and a controlling interest was purchased in the Kirkland-Hudson Bay Gold Mines Ltd.

Many levels have been opened to explore and develop the mine, which is serviced by 4 surface shafts and 2 internal shafts. The No. 4 internal shaft, which starts at 4,325 feet, has taken the workings to a depth of 8,150 feet. In 1956, Lake Shore Mines Ltd. and the adjoining Wright-Hargreaves property came under the control of Little Long Lac Gold Mines Ltd. Wright-Hargreaves ore has been treated in the Lake Shore mill since 1957 when the Wright-Hargreaves mill closed.

Geology

O.D.M. Map No. 1945-1 (Teck township) shows the distribution of rock types on the Lake Shore property at the surface. Shafts No. 1 and No. 3 were sunk in the west end of the main stock of Algomian syenite porphyry in the Kirkland Lake camp. This main intrusive body trends N.65°E., or approximately parallel to the vein system, and dips steeply south. Because the south contact has a flatter dip than the north boundary, the intrusive body widens with depth. West of the shaft-section, it interfingers with augite syenite and syenite and has an almost vertical plunge. This area of complexly intermingled intrusives has been highly productive ground. The syenite porphyry is the most prevalent host rock of the veins in the mine and has replaced all other rock types in the eastern half of the mine and on the lower levels. Quartz-feldspar porphyry is found in small irregular bodies within the syenite porphyry. A diabase dike occurs near the west boundary of the property and cuts all other rock types as well as veins and orebodies. This dike is nearly vertical and strikes about normal to the veins. The main syenite porphyry intrusive and the interfingered intrusives to the west are flanked by sediments and tuffs of the Temiskaming series.

The North (No. 2) vein zone, which lies along the main Kirkland Lake fault, is the strongest and most productive structure in the mine. The fracture pattern associated with it includes the less continuous South (No. 1) vein zone and various diagonal vein fractures lying between them. This broad zone of fracturing, located largely on the Lake Shore property, is the result of the transfer of the main faulting movement from the North vein zone in the western part of the camp to the South vein in the eastern part. The productive veins occur along the fracture system described above and are found in all rock types within the fractured zone except the diabase. The veins range in size from narrow high-grade quartz stringers to quartz stockworks and quartz breccia bodies having widths up to 70 feet.

Post-ore faults are well-defined planes of movement and may be classified as strike faults, oblique faults, and crossfaults. The most important post-ore fault is a steep-dipping crossfault occurring near the east end of the mine. It is called the Lake Shore fault. Movement of the east side to the north faulted the South (No. 1) vein from Lake Shore ground into Wright-Hargreaves property.

- Production** Total production from Lake Shore Mines Ltd. from 1918 to 1962 inclusive amounted to \$260,177,053 from 16,285,498 tons of ore milled. (Figures supplied by O.D.M. statistician.)
- References** O.D.M. Vol. XXIX, 1920, pt. 4, pp. 33-36.
O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 112-125.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 150-160.
O.D.M. Vol. LXVII, 1958, pt. 2, pp. 47-50.
Structural Geology of Canadian Ore Deposits, Vol. I, Canadian Inst. Min. Met., Geology Division, 1948, pp. 644-653.
Canadian Mines Handbook, 1962, pp. 138, 139.
"Three Miles of Gold" by S. A. Pain. The Ryerson Press, Toronto.
- Remarks** Production from Lake Shore Mines Ltd. is the largest in the Kirkland Lake camp. The company does not plan to explore below the 8,025-foot level under present conditions.

LAKESIDE-KIRKLAND GOLD MINES LTD.

- Location** The property consisted of a group of 7 patented claims on the south shore of Gull Lake in Lebel township. The Kirkroyale property adjoins Lakeside-Kirkland. The claim numbers are: L.1695, L.1697, L.2924, L.2938, L.3214, L.6249, L.6260.
- Chief Metal Present** Gold.
- History and Development** The early development of the property was done by Queen Lebel Gold Mines Ltd., which was incorporated in 1921. This company sank a shaft to a depth of 60 feet on a quartz vein in the northeast corner of claim L.2924 adjacent to the Kirkroyale boundary. The Anglo-Canadian Syndicate optioned the property in the spring of 1923 and carried on underground work until the end of the year. The shaft was deepened and more than 500 feet of lateral work was done on the 300-foot level.
Queen Lebel Gold Mining Co. Ltd. was incorporated in 1934 to succeed Queen Lebel Gold Mines Ltd. Later in the same year, the name was changed to Lakeside-Kirkland Gold Mines Ltd. Mining was resumed for a period of 6 months. During this time an additional 600 feet of lateral work was done on the 300-foot level, and considerable underground diamond-drilling was accomplished. Work on the property started again in 1936 when a second shaft was sunk to 78 feet about 1,000 feet away from the No. 1 shaft on a bearing S.70°W. No further work was undertaken until 1938 when the No. 2 shaft was deepened to 575 feet and about 240 feet of lateral work was done. By midsummer the mine had closed. The property remained idle until 1941 when operations were resumed under the direction of Mining Research Corporation. The 300-foot level at the No. 1 shaft was resampled and some underground diamond-drilling was done. Work ceased before the end of the year.
- Geology** The claims are underlain by conglomerate, greywacke, and pyroclastics of the Timiskaming series. In the east half of the property these rocks have been intruded by basic syenite and porphyry of Algomian age. O.D.M. Map

No. 53a, dated 1944, shows the "Middle Harvey fault" branching where it enters the east claim (L.2924) in the southwest corner. The north branch of this fault trends northeast, approximately bisecting the claim, and passes through the No. 1 shaft workings. The No. 1 vein dips at 68° NW. It was trenched for 600 feet along this fault, which roughly follows a contact between porphyry and conglomerate. Where the vein is exposed, it varies from 2 to 4 feet in width, and is of the quartz-carbonate variety containing minor amounts of molybdenite, pyrite, galena, sphalerite, chalcopyrite, and low values in gold. A series of similar veins parallel to the No. 1 were cut in the crosscut on the 300-foot level.

**Sampling Results
References**

No concentrations of gold capable of being profitably mined were found. O.D.M. Vol. XXXII, 1923, pt. 4, pp. 69, 70.
O.D.M. Vol. XLVIII, 1939, pt. 1, pp. 140, 141.
O.D.M. Vol. LI, 1942, pt. 1, pp. 135, 136.
O.D.M. Map No. 53a, dated 1944.
Diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

The charter of Lakeside-Kirkland Gold Mines Ltd. was cancelled in 1956.

LEBEL LODGE LTD.

Location

The property consists of a group of 5 patented claims in the northwest quarter of Lebel township. South and east, Continental Kirkland ground adjoins the property. The claim numbers are: L.2262, L.2908, L.2909, L.2994, L.2995.

Chief Metal Present

Gold.

**History and
Development**

Following the discovery of gold at Kirkland Lake, the 5 claims were staked in Lebel township by W. J. Post, and sufficient work was done to bring them to patent. Lebel Lode Ltd. was incorporated on this group of claims in 1921. Trenching and test-pitting exposed a number of veins; 4 diamond-drillholes were put down in 1923. The No. 1 shaft was sunk to a depth of 30 feet on claim L.2262 before operations were suspended in 1929. An examination of the property was made by P. E. Hopkins in 1933 and, on his recommendation, an inclined shaft was put down on the No. 4 vein on claim L.2909 in 1934. The property has been idle since 1935.

Geology

The north contact of the regional belt of Timiskaming sediments, volcanics, and pyroclastics with the older Keewatin rocks extends across the 2 north claims of the group (L.2295, L.2908). O.D.M. Map No. 53a, dated 1944, shows the Timiskaming series south of the contact to be alternating bands of conglomerate, greywacke, tuff, and agglomerate, all trending about S.75°E. These rocks have been intruded by porphyries of Algomian age and displaced by several faults striking east of north. Two sill-like bodies of porphyry in the east half of claim L.2909 are cut off to the east by one of these faults.

The most important vein, the No. 4 on which the inclined shaft was sunk to a depth of 50 feet, occurs in a fracture zone adjacent and parallel to a porphyry contact close to the centre of claim L.2909. This vein, which dips at 75°S., was traced for 400 feet on the surface. Hopkins described it as consisting of carbonated and silicified trachyte (porphyry) that has been impregnated with 5-40 percent fine-grained pyrite, having traces of chalcopyrite, and containing a few irregular veinlets of quartz.

Sampling Results

"A 140-foot section of this (No. 4) vein contains interesting gold values, namely, \$36.00 over 24 inches, \$5.20 over 34 inches, and a few others from \$2.40 to 40 cents. These values in themselves are not economic but they are sufficiently interesting to warrant a thorough examination being made of this vein." (P. E. Hopkins, 1933)

References

O.D.M. Vol. XXXII, 1923, pt. 4, p. 69.
O.D.M. Vol. XLIV, 1935, pt. 2, p. 61.
O.D.M. Map No. 53a, dated 1944.
Canadian Mines Handbook, 1952, p. 280.
Reports by R. E. Dye (1922), J. W. Morrison (1926), P. E. Hopkins (1933), H. F. Fancy (1937), J. J. McNab (1939), with diamond-drilling information, etc., in O.D.M. Resident Geologist's files, Kirkland Lake.

LEBEL ORO MINES LTD.**Location**

The property consists of 5 patented claims in Lebel township. The west end of Mud Lake projects into the southeast claim of the group (L.3500). The claim numbers are: L.3066, L.3067, L.3191, L.3411, L.3500.

Chief Metal Present

Gold.

History and Development

Lebel Oro Mines Ltd. was incorporated in 1920 and an inclined shaft was started on a vein in the southeast corner of the southwest claim (L.3191). By the end of 1921, when the mine closed, the shaft had a depth of 60 feet. Late in 1923 the property was reopened and operated for about a year. During this time the shaft was deepened to a vertical depth of 203 feet and levels were opened up at 100 feet and 200 feet. In 1927 the mine was pumped out and 900 feet of drifting and 450 feet of crosscutting were done. The Nipissing Mining Co. Ltd. took an option on the property in 1928 and carried out a program of surface drilling. In May 1936 the mine was again dewatered. Eighteen hundred feet of diamond-drilling was done from underground and 900 feet was done from surface before operations ended in October of the same year.

A detailed geological map and geophysical surveys of the property were made in 1948 and followed by a diamond-drilling program. The company was reorganized in 1949 and became Consolidated Lebel Oro Mines Ltd. A second reorganization took place in 1952 and the name was changed to Copper-Man Mines Ltd.

Geology

A wide area of drift, extending across the middle of the property in a northwest-southeast direction divides the rock exposures into 2 groups that occur on and adjacent to the north and south boundaries of the property. A few small outcrops of basic syenite and conglomerate occur in the drift near the west boundary. O.D.M. Map No. 53a, dated 1944, shows all the outcrops in the south claims (L.3191, L.3550) to be part of the large mass of "porphyrite" outcropping extensively on the neighbouring King Kirkland property to the south. ("Porphyrite" is a term including porphyry and those parts of the intruded country rock so altered that no contacts exist between them and the intrusive.)

E. W. Todd stated in his 1928 report to the company that the shaft was sunk on one of 3 parallel veins striking N. 30°E. and dipping 65°-70° NW. The vein was of white quartz up to 18 inches in width accompanied by mineralized schist extending across a total width of 6 feet between carbonized wallrocks. Pyrite was the chief sulphide present. Stringers of dark-coloured quartz appeared to contain the best gold values.

The work done in 1948 by Geo-Technical Development Co. Ltd. indicated a series of northeasterly-trending faults or shear zones containing the veins. Because these faults are cut and displaced by crossfaults, the structural conditions would appear to be similar to those encountered in the neighbouring Bidgood Kirkland mine to the east.

Sampling Results

In the report by E. W. Todd (1928) are listed the assays from 43 channel samples he took underground. He stated that these samples were taken "principally in order to determine the association of the values and to test out the possibilities of some of the fractures away from the main vein. No encouragement was obtained, except in the case of the samples from the main drift, although in most cases the material assayed contained considerable fine pyrite."

Of the above-mentioned assays, 19 were under \$1.00, 9 were \$5.00 and up. The best value obtained was \$30.60 over a width of 9 inches cut from the back of the main vein.

References

O.D.M. Vol. XXXII, 1923, pt. 4, pp. 72, 73.
O.D.M. Map No. 53a, dated 1944.

Reports by F. L. Smith (1924), W. P. Murdock (1928), E. W. Todd (1928), Geo-Technical Development Co. Ltd. (1948), with progress reports and diamond-drilling information in the O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

Lebel Oro Mines Ltd. operated a producing gold mine at Long Lake near Sudbury during the years 1937, 1938, and 1939.

MACASSA MINES LTD.

Location

The Macassa Mine is the most westerly of the 7 mines located along the Kirkland Lake "break". The property consists of a group of 11 patented claims: L.1616, L.1617, L.2640, L.2641, L.2642, L.2830, L.2837, L.2838, L.3044, L.4185, L.4186.

Chief Metal Present

Gold.

History and Development

During the summer of 1911, Dave Elliott staked 2 claims, the south one (L.1617) being on the westward extension of the Kirkland Lake "break" from the adjoining Kirkland Lake Gold property. Elliott-Kirkland Gold Mines Ltd. was incorporated in 1916 and acquired 1 additional claim (L.3044) to the south. By 1919, when the workings were allowed to flood, a vertical shaft had been sunk on the Kirkland Lake "break" to a depth of 500 feet on claim L.1617, with lateral work on 5 levels, but no veins of economic importance were found.

Macassa Mines Ltd. was organized by R. A. Bryce in 1926. It took over the 3 Elliott claims and 3 others (L.2830, L.2837, L.2838) to the west. In that year and in 1927, further work was done on the 500-foot level of the Elliott shaft. By this time it was known that the pipe-like body of syenite, where important ore shoots were found at the Kirkland Lake Gold mine, pitched westward on the Main "break" and entered Macassa ground. In 1931, Bryce arranged to drive westward along the break from the 2,475-foot level of Kirkland Lake Gold. This work found the first of the Macassa ore bodies. No. 1 shaft was started on claim L.2837 and sunk to connect with the workings at this horizon.

Production has been continuous since 1933 when a 200-ton mill, later enlarged, went into operation. The same year Macassa acquired the 5 adjoining claims to the south from United Kirkland Gold Mines Ltd.

The property has been explored and developed on many levels from 3 shafts and 2 winzes. The No. 2 winze from the 4,625-foot level took the workings to below the 6,300-foot level in 1962.

O.D.M. Map No. 1945-1 shows the rock formations at the surface on the Macassa property to consist of tuffs, sediments, and a variety of intrusive types. The main sedimentary rock type, both on the surface and in the mine workings, is boulder and pebble conglomerate. Most of the mine workings are in the intrusives classifiable as augite syenite, syenite, syenite porphyry, and diabase. The augite syenite is an elongated tabular mass of irregular outline. It follows along the regional trend of the formations (N. 60° E.-N. 80° E.) and dips steeply to the south. It is the most widespread of the intrusive types and has been intruded by a westward-pitching pipe-like mass of syenite. The Main "break" has sliced the syenite into 2 parts and the southern part has been thrust upward about 1,500 feet. The syenite porphyry occurs as dikes cutting the syenite and augite syenite. Only one narrow diabase dike has been found in the mine workings. It cuts all other rock formations.

Geology

The most important structural control in the mine is the Kirkland Lake fault, or Main "break", which has a general dip of 80°S. for about 3,500 feet before it starts to flatten. Most of the ore originally occurred along the Main "break" and in hanging-wall subsidiaries; but in recent years by far the greater part of the mill feed has been coming from veins on and adjacent to an important foot-wall subsidiary of the Main "break" at depth. This structure is known as the "04" break. It is being mined, along with its subsidiaries below the 4,625-foot level in the vicinity of the No. 2 winze. Some of its veins extend into the Tegren property to the west.

The productive veins are always quartz-filled fractures. They occur in every type of country rock in the zones of fracturing with the exception of the diabase. In longitudinal section, the upper extremity of the ore bodies in the mine rakes to the west at about 40°, and no ore has been found above the 1,300-foot horizon. The rake roughly parallels the margin of the main intrusive body and may have been controlled by this structural feature. The displacement of veins, ore shoots, and structures by post-ore faulting is small.

Production

By the end of 1962, total ore mined and milled amounted to 3,534,024 tons, with an average recovered value of \$14.94 per ton. (Macassa annual report 1962)

References

- O.D.M. Vol. XXIX, 1920, pt. 4, p. 26.
O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 147, 148.
O.D.M. Vol. XLIII, 1934, pt. 1, pp. 86-88.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 125-132.
O.D.M. Vol. LXXI, pp. 44-46.
Plans and sections in O.D.M. Resident Geologist's files, Kirkland Lake.
Structural Geology of Canadian Ore Deposits, Vol. I, Canadian Inst. Min. Met., Geology Division, 1948, pp. 644-653.
"Three Miles of Gold" by S. S. Pain. The Ryerson Press, Toronto.

Remarks

Macassa Mines Ltd. and Bicroft Uranium Mines Ltd. were amalgamated in 1961 under the name of Macassa Gold Mines Ltd.

MARTIN-BIRD GOLD MINES LTD.

- Location** The property lies east of the centre of Hearst township. It consists of 18 patented claims and 12 claims held by Licence of Occupation in the southwest arm of Larder Lake. The claim numbers are: Patented claims: H.F.364, H.S.900, H.S.901, H.S.1180, L.23717, L.24849, L.24850, L.24935, L.24957, L.24958, L.25034, L.25072, L.25076, L.29085, L.29086, L.39596, L.40960, L.40961.
- Licences of Occupation: L.O.28354, L.O.31352, L.O.40847, L.O.40848, L.O.40849, L.O.40850, L.O.40851, L.O.40852, L.O.41993, L.O.41994, L.O.41995, L.O.41996.
- Chief Metal Present** Gold.
- History and Development** Martin-Bird Gold Mines Ltd. was incorporated in 1936 and acquired the nucleus of the property, a group of 9 claims, from the Martin-Bird Syndicate. The latter company sank a shaft to a depth of 140 feet with lateral work on the 125-foot level in 1934-35. Development work was continuous from 1936-1939 when underground operations came to an end. There are 2 shafts on the property on claim L.23717. Each shaft is 400 feet deep with levels at 125, 250, and 375 feet. A development raise was driven from the 375-foot level. There is a sublevel at a depth of 320 feet. Considerable surface diamond-drilling had been done; close to 30,000 feet drilled from underground on the 3 levels. Additional surface diamond-drilling was done during the summers of 1945 and 1946.
- Geology** In the vicinity of the mine, the country rock is largely greywacke with minor amounts of pebble conglomerate of Timiskaming age. A band of Keewatin pillowed lavas extends along the east side of Sharp Creek. These rocks have been intruded by bodies of Algomian syenite porphyry, with associated small occurrences of lamprophyre, and by later diabase dikes.
- Structurally the Martin-Bird mine is located along a zone in the sediments where a north-south trending syncline is sharply dragged to the east. The regional strike of the sediments is N.20°W., but within the dragged zone the beds strike about N.60°E., and on surface show evidence of shearing, veining, and rock contortion. There is no record of any noticeable shear or of any fault structure in the mine workings where the vein zone strikes N.48°E.-N.65°E. and dips steeply to the northwest. Gold values in the mine were found chiefly along the edges of quartz-carbonate veins and in sulphides in altered greywacke. The veins are twisting and discontinuous bodies which were difficult to follow. Some of the small quartz stringers contain native gold.
- Ore Reserves** In a report to the company, dated 2 April 1945, S. A. Pain, consulting engineer, estimated that the property had possible ore amounting to 157,600 tons of \$5.00 grade and 23,500 tons of \$7.20 grade (gold valued at \$35.00 per ounce).
- References** O.D.M. Vol. XLIV, 1935, pt. 2, pp. 56-58.
O.D.M. Vol. XLIX, 1940, pt. 1, p. 170.
O.D.M. Vol. LVI, 1947, pt. 8, pp. 26, 27.
Canadian Mines Handbook 1960, p. 155.
Excerpts from report by S. A. Pain (1945) in O.D.M. Resident Geologist's files, Kirkland Lake.
- Remarks** Property dormant since 1946 but company has outside interests.

MOFFAT-HALL GOLD MINES LTD.

- Location** The property consisted of 14 patented claims located between the Bidgood Kirkland property and Crystal Lake in the northeast quarter of Lebel township. The claim numbers, as shown on O.D.M. Map No. 53a, dated 1944, were: L.S.4, L.S.5, L.S.69, L.S.270, L.S.271, L.S.378, L.S.406, L.S.408, L.3179, L.7795, L.7796, L.7797, L.8043, L.8044.
- Chief Metal Present** Gold.
- History and Development** The property was staked in 1917 and 1918 by F. C. Bidgood and the claims were patented in 1921 in the name of Moffat-Hall Gold Mines Ltd. The property was optioned to Tonapah Mining Co. in 1923, and to the McIntyre Porcupine Gold Mines in 1928. The company was reorganized that latter year (1928) and became Moffat Hall Mines Ltd. A 2-compartment shaft was started in April 1931 and sunk to a depth of 550 feet. Before the mine closed in March 1932, four levels had been opened, and 1,200 feet of crosscutting and 1,600 feet of drifting were done. In February 1934, the property was leased to H. Jardin, who carried on operations until September when Bidgood Kirkland Gold Mines Ltd. took over the lease. A raise was driven to connect the Bidgood 500-foot level with the Moffat-Hall 425-foot level, and production continued until July 1935.
- A second reorganization of the company was made early in 1936 and the name was changed to Moffat-Hall Mining Co. Ltd. Operations were resumed for a short time but were suspended again in October of the same year. During the life of the mine, 3,464 feet of underground diamond-drilling was done. Six diamond-drillholes were put down from surface in 1938 and another 6 surface holes were drilled in 1941.
- Geology** O.D.M. Map No. 53a shows that the property lies wholly within the Timiskaming belt of sediments, volcanics, and pyroclastics; but is largely underlain by Algoman intrusives. In the southcentral part, much light-coloured "porphyrite" is exposed. (This term is used to describe intrusive porphyry and those parts of the intruded country rock porphyritized to such an extent that no definite contacts exist between them and the intrusive.)
- The mine workings are in the north-central part of the property at the west end of claim L.S.4, close to the mine on the adjoining Bidgood Kirkland ground. The shaft was sunk on the No. 1 vein, the most important of several veins opened up on the property. The No. 1 vein strikes NE. and dips steeply NW. The best ore in the mine came from the upper levels where it occurs on the sheared contact between a narrow porphyry dike and the Bidgood diorite mass. The diorite mass is not exposed, but underlies much of the swampy area on claim L.S.4. Where the vein cut diorite only, it contained low values over broad widths. The ore in general consisted of fractured and altered wallrock heavily mineralized with fine pyrite and cut by dark quartz stringers. The same vein was developed to the northeast on the Bidgood Kirkland property where the structure it occurs in is known as the Moffat-Hall break. This No. 1 vein was cut off southwest of the shaft by a crossfault and its extension beyond the fault was not found. The Bidgood Main break extends to the southwest across the 2 northwestern claims of the group (L.7795, L.7796).
- Production** H. Jardin shipped 3,178 tons of ore to the Noranda mill prior to September 1934 when Bidgood Kirkland took over the lease. The balance of the ore mined in 1934 and 1935 was treated in the Bidgood Kirkland mill.
- Total ore mined and milled amounted to 16,388 tons.
Gold to the value of \$166,569 was produced. (O.D.M. Vol. LVIII, 1949, Table II in pocket)

References O.D.M. Vol. XXXII, 1923, pt. 4, p. 75.
O.D.M. Vol. XXXVII, 1928, pt. 2, p. 157.
O.D.M. Vol. XLIV, 1935, pt. 2, pp. 59, 60.
O.D.M. Map No. 53a, dated 1944.
Reports by B. S. W. Buffam dated 1938, and others, with diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks The charter of Moffat-Hall Mining Co. Ltd. was cancelled in 1958. The claims reverted to the Crown and have been restaked.

MORRIS KIRKLAND GOLD MINES LTD.

Location The property consists of a group of 5 patented claims near the centre of the east half of Lebel township. The claim numbers are: L.6406, L.7127, L.7477, L.7478, L.7479.

Chief Metal Present Gold.

History and Development The claim (L.7479) on which all the subsequent development work was done was one of several staked by E. B. Wood. In 1920 these claims became part of the group taken over by the newly formed Wood-Kirkland Gold Mines Ltd. Tonapah Mining Co. had an option on the property in 1923. Wood-Kirkland sank the No. 1 shaft in the southwest corner of claim L.7479 to 100 feet before it was reorganized in 1928 under the name of Kirkland Gold Belt Mines Ltd. The No. 2 shaft, 1,000 feet northeast of the No. 1 shaft, was started in 1929. It was sunk to a depth of 768 feet before the mine closed at the end of 1934. Morris Kirkland Gold Mines Ltd., incorporated in January 1935, took over the property and resumed operations. The property was under continuous development by Morris Kirkland until late in 1941. By this time, No. 2 shaft had reached a depth of 1,651 feet, with levels and lateral work at 125-foot intervals. A 100-ton mill was in production from 1936 to 1938, and again in 1940 and 1941. Before the end of 1941, operations ceased and the machinery and equipment were sold.

Geology O.D.M. Map No. 53a, dated 1944, shows the property to be entirely underlain by sediments and volcanics of the Timiskaming series with the exception of a few small intrusions of Algoman porphyry. Part of a wide trachyte flow trending east-west occupies the south half of the property. Mine workings on claim L.7479 are confined to this flow. The ore at the Morris Kirkland was associated with a fault zone referred to as the "Main break", which had a strike roughly N.30°E. and a dip close to vertical. On surface and on the upper levels, a narrow porphyry dike followed the main fault zone and the ore. It was not found underground below the 875-foot level. To the northeast, the Main break and the ore contained in it ended abruptly against the near-vertical faulted contact of the trachyte and an adjoining band of greywacke. The Main break was traced southwest along-strike for 750 feet. The mineralized gold-bearing zones consisted chiefly of sulphides, of which pyrite was by far the most common; quartz was relatively rare.

Production 127,253 tons of ore valued at \$621,544. (O.D.M. Vol. LVIII, 1949, Table II in pocket)

References O.D.M. Vol. XXXII, 1923, pt. 4, p. 75.
O.D.M. Vol. XXXVII, 1928, pt. 2, p. 158.
O.D.M. Vol. XLV, 1936, pt. 1, p. 141.
O.D.M. Vol. LI, 1942, pt. 1, p. 162.
O.D.M. Map No. 53a, dated 1944.
Report by Nelson Hogg (1950) with geological and assays plans in O.D.M. Resident Geologist's files, Kirkland Lake.

MURPHY PROPERTY

Location	A group of 13 patented claims in the southwestern part of Teck township immediately west of the Kirkland Gateway property and north of Blanche River. The claim numbers are: L.6839, L.6842, L.6843, L.6844, L.6863, L.9809, L.9810, L.9811, L.9812, L.9813, L.9814, L.16614, L.16680.
Chief Metal Present	Gold.
History and Development	Several small contiguous claim groups staked in the early days of the camp were patented in the 1920s. These claims became the Murphy property and were eventually optioned by M. J. O'Brien Ltd. in 1937. A program of diamond-drilling was carried out under the supervision of W. S. Dyer, geologist for the company. Twelve drillholes, aggregating 4,559 feet, were put down along the probable west extension of the main Kirkland Lake fault. No ore was found and the option was dropped.
Geology	<p>The claims are underlain by Timiskaming sediments and tuffs intruded by basic syenite, syenite porphyry, lamprophyre, and diabase.</p> <p>The drilling corroborated the geological and topographical evidence that the main Kirkland Lake fault trends north of east along the sediments-tuff contact on claim L.6863 and L.6842. Two holes sectioning the structure near the southeast corner of claim L.6863 indicated that the fault has a dip of about 62°SE.; to the west, though, it appears to steepen. A fault gouge, ranging from ½ inch to 4 inches in width, was intersected in some of the holes. The rocks adjacent to the fault are carbonatized and silicified, and contain quartz and calcite stringers but scarcely any mineralization. The deepest hole cut the fault at a vertical depth of 580 feet.</p>
Grade	Only traces of gold were reported from the drilling operations.
References	O.D.M. Vol. LVII, 1948, pt. 5, p. 51. Diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

NORTHLAND GOLD MINES LTD.

Location	The property consists of a group of 25 patented claims adjoining the holdings of Upper Canada Mines Ltd. in Gauthier township. The claim numbers are: L.S.379, L.8632, L.8653, L.8689, L.9235, L.9313, L.9314, L.9356, L.9357, L.9396, L.9723, L.9724, L.9754, L.9755, L.9756, L.9895, L.10660, L.10661, L.10890, L.11093, L.38453, L.38454, L.38455, L.39062, L.39063.
Chief Metal Present	Gold.
History and Development	<p>Northland Gold Mines Ltd. was incorporated in 1922 when the group consisted of 14 claims. Following a program of surface exploration and diamond-drilling, a shaft (No. 1) was sunk to a depth of 1,020 feet on claim L.8689, and levels were established at 250-foot intervals. A second shaft, about 1 mile southeast of No. 1 shaft, was sunk to a depth of 50 feet. Most of the underground development was done from No. 1 shaft on the 1,000-foot level. Operations ended in 1929.</p> <p>Early in 1940 the company was reorganized as Northland Mines (1940) Ltd. and additional claims were acquired. In that year, and in 1944-45-46 and -49, much diamond-drilling was done from surface, especially in the southern part of the property.</p>

Geology	Most of the property is drift-covered. The north contact of the regional belt of Timiskaming sediments, volcanics, and pyroclastics trends across the north claims of the group in a southeasterly direction. The Keewatin rocks north of the contact are acid fragmental lavas. Most of the southwest half of the property is occupied by syenitic rocks of Algomian age intruding trachytes and sediments. The intrusive contact roughly bisects the property from northwest to southeast. The syenite is cut by a north-trending diabase dike west of the No. 1 shaft. This shaft was sunk in the syenite, and the drift on the 1,000-foot level followed a strong "break" with mineralized wallrocks. Drilling to the east revealed a zone of strong shearing and brecciation along the greywacke-syenite contact; this may be the continuation of the fault on the 1,000-foot level. This contact zone, though sheared and carbonatized, proved to be devoid of mineralization except in the vicinity of the No. 2 shaft.
Sampling Results	The 1949 diamond-drilling outlined a zone, for 750 feet, averaging 0.21 ounces of gold per ton over 2 feet. (The Financial Post Survey of Mines, 1954, p. 235)
References	O.D.M. Vol. XXXII, 1923, pt. 4, p. 81. O.D.M. Vol. XXXVIII, 1929, pt. 1, p. 138. O.D.M. Vol. L, 1941, pt. 8, pp. 19, 20. Canadian Mines Handbook, 1956, p. 70. Reports by K. B. Heisey (1923), and others, with diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.
Remarks	Northland Mines (1940) Ltd. was succeeded by Consolidated Northland Mines Ltd. in 1954. The company is active in exploration and on outside properties.

OMEGA GOLD MINES LTD.

Location	The property consisted of a group of 25 patented claims in the southern part of McVittie township, north of the town of Larder Lake. Five of these claims (the Costello group) were formerly held by Canadian Associated Goldfields Mining Co. Ltd. and the remaining 20 by Crown Reserve Mining Co. Ltd. The claim numbers are: Associated Goldfields: T.219, L.S.417, L.1794, L.9399, L.12377. Crown Reserve: L.S.191, L.7992, L.7993, L.7994, L.8045, L.8046, L.8047, L.8713, L.8825, L.8826, L.8841, L.8842, L.8879, L.9032, L.9373, L.9375, L.9376, L.9616, L.11211, L.11773.
Chief Metal Present	Gold.
History and Development	Omega Gold Mines Ltd. was incorporated in 1935. It took over the above-mentioned properties held at that time by Proprietary Mines Ltd. and Canadian Reserve Mines Ltd. The original gold discovery was made in 1914 by Jack Costello on claim L.1794 and his claim group was acquired by Canadian Associated Goldfields in 1921. The Costello vein was traced to the northeast into claim L.S.191 of the Crown Reserve group. Shaft-sinking on this vein was started by Canadian Associated Goldfields in 1921 and was continued by Crown Reserve in 1922. Canadian Associated Goldfields built a mill in 1926 and was in production until the mine closed in the spring of 1928. Underground work was suspended at the Crown Reserve later in the same year. On the Crown Reserve property, the shaft had reached a depth of 1,200 feet, with lateral work on levels at approximately 125-foot intervals. The Canadian Associated Goldfields shaft had been sunk to a depth of 1,050 feet with lateral work on 7 levels.

In 1930, Proprietary Mines Ltd. acquired the assets of Canadian Associated Goldfields Ltd. Canadian Reserve Mines Ltd. was formed in 1932 to develop the 2 mines further, but no work was done.

Omega Gold Mines Ltd. commenced milling operations early in 1936 and was in continuous production until the mine closed in 1947. The No. 1 shaft (Crown Reserve) was deepened in 1939-40 and a winze from the 1,550-foot level to 2,000 feet permitted the opening up of 3 new levels in 1943. In 1950 the name of the company was changed to Lomega Gold Mines Ltd. and some surface diamond-drilling was done. The name was changed again in 1956 to Lomega Explorations Ltd.

Geology

On the Omega property the rock formations trend eastward on the western claims, swing to the northeast on the claims where the Costello vein occurs, and return to an east-west strike on the northeast claim of the group (L.8713). They consist of interbanded sediments, volcanics, and pyroclastics of the Timiskaming series, in fault contact on the Larder Lake "break" with Keewatin lavas to the south. Syenite underlies the southeastern claims; and smaller bodies of syenite and related rocks are intrusive into the sediments and lavas.

The ore horizon, with a dip of 60°S. at surface, was explored in places throughout an overall length of about 2,500 feet. It lies within the Larder Lake "break" consisting of a wide zone of carbonate chlorite schist containing a later graphitic fault and a band of carbonate rock ("dolomite"). Two narrow dacitic lava flows, dividing the talc chlorite schist into north and south shear zones, contained practically all the ore developed in the mine in the form of large irregular replacement bodies. The ore zone shows a gentle swing in strike, and it is at the apex of the arching that the orebodies occurred. A small tonnage of ore was found in "dolomite" (No. 17 ore body) at the east end of the mine.

Production

Total ore produced from the property amounted to 1,615,081 tons valued at \$7,788,606. (O.D.M. Vol. LXII, 1953, pt. 1, p. 15)

References

O.D.M. Vol. XXXII, 1924, pt. 3, pp. 14-16.
O.D.M. Vol. XXXVII, 1928, pt. 1, p. 90.
O.D.M. Vol. L, 1941, pt. 7, pp. 82-87.
Plan of 800-foot level in O.D.M. Resident Geologist's files, Kirkland Lake.
Structural Geology of Canadian Ore Deposits, Vol. I, Canadian Inst. Min. Met., Geology Division, pp. 658-662.
Canadian Mines Handbook, 1941, pp. 135, 136.
Canadian Mines Handbook, 1948, p. 325.
Canadian Mines Handbook, 1951, pp. 117, 118.

Remarks

The charter of Lomega Exploration was cancelled in 1962. The former McVittie township property of Omega Gold Mines Ltd. is now held by Larcon Explorations Ltd.

PAWNEE-KIRKLAND GOLD MINES LTD.

Location

The property consists of a group of 4 patented claims at the centre of Lebel township, southeast of the King Kirkland property. The claim numbers are: L.S.464, L.S.465, L.S.466, L.S.467

Chief Metal Present

Gold.

History and Development

Pawnee-Kirkland Gold Mines Ltd. was incorporated in 1922. Shaft-sinking commenced on claim L.S.466 early in 1927. By the end of the year, the shaft had reached a depth of 779 feet, with stations at 125-foot intervals.

Surface diamond-drilling by the Lucky Tiger interests, approximately 1,300 feet of crosscutting, and 1,900 feet of drifting were done in 1928 before the mine closed in December. Regal Kirkland Gold Mines was incorporated in 1933 and took over the Pawnee-Kirkland property. In June 1936, Regal-Kirkland dewatered the mine and a program of sampling, drifting, and crosscutting was done, followed by 1,000 feet of underground diamond-drilling. The results of this work were disappointing. Before the end of the year, the mine again closed and the property reverted to Pawnee-Kirkland Gold Mines Ltd.

Geology

O.D.M. Map No. 53a, dated 1944, shows that with the exception of a few small outcrops of porphyrite on the north boundary, all the rocks exposed on the property are volcanics and sediments of Timiskaming age trending in roughly parallel bands about 20° south of east across the claims. A narrow band of tuffaceous conglomerate in the centre of the property lies between 2 wide trachyte flows. The shaft is near the centre of the northeast quarter of claim L.S.466, in the south trachyte flow. It was sunk on a vein that Hopkins in 1923 described as occupying a fracture uncovered for several hundred feet in an east-west direction. The wallrocks were impregnated with iron pyrites and replaced by quartz and calcite for a few inches on both sides of the fracture. Hopkins mentioned that one portion of the vein, about 50 feet in length, gave encouraging assays in gold over widths ranging from 3 to 15 inches.

In 1928, Todd described the vein underground as follows: "The vein dips to the south somewhat more steeply in the lower levels than in the upper; between the 500-foot and 750-foot levels it is practically vertical. The rocks seen along the vein walls consist of altered trachyte and sediments in which occur stringers of quartz. The narrow crushed zone is impregnated with fine pyrite. Molybdenite occurring on slip planes is common, and occasional visible gold is encountered. Short lengths of commercial ore have been developed, but the distribution of the values has so far proved to be erratic."

On O.D.M. Map No. 53a, dated 1944, the Long Lake fault (trending east of north) and several of its subsidiaries are shown crossing the property, and a shear trending east-west parallel to the main vein is shown about 75 feet north of the shaft.

Sampling Results

The following information was reported by C. D. Salkeld in 1933.

At the 125-foot level, \$12.90 over 2.4 feet for a length of 111 feet.

At the 250-foot level, \$13.40 over 2.5 feet for a length of 128 feet.

At the 500-foot level, \$9.00 over 3.1 feet for a length of 48.5 feet.

At the 750-foot level, \$5.50 over 2.5 feet for a length of 94.1 feet.

References

O.D.M. Vol. XXXII, 1923, pt. 4, p. 75. (P. E. Hopkins)

O.D.M. Vol. XXXVII, 1928, pt. 2, p. 158. (E. W. Todd)

O.D.M. Vol. XLVI, 1937, pt. 1, pp. 196, 197. (Regal Kirkland)

O.D.M. Map No. 53a, dated 1944.

Reports by G. B. Langford (1928) and C. D. Salkeld (1933); assays, plans, etc., in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

The charter of Pawnee-Kirkland Gold Mines was cancelled in January 1963.

PLANET GOLD MINES LTD.

Location

The property consisted of a group of 3 patented claims in the southeast corner of Boston township. The claim numbers were: L.4906, L.4737, L.5025.

Chief Metal Present

Gold.

History and Development	Planet Gold Mines Ltd. was incorporated in 1937 to develop the property. The 2 south claims, L.4737 and L.5025, were originally known as the Authier Group. During 1937 and 1938, after completion of considerable surface work and some diamond-drilling, a shaft was sunk to a depth of 48 feet. Howey Gold Mines Ltd. had an option on the property in 1938. Massore Mining Syndicate optioned it in 1941. The property was leased to Lebon Gold Mines Ltd. from 1945 to 1951. Lebon did some additional diamond-drilling and surface trenching in 1946.
Geology	The property is underlain by Keewatin dioritic and coarse diabasic pillow lavas intruded by a boss of Algoman granite in which the shaft was sunk in the northeast corner of claim L.4737. Quartz veins outcrop on all 3 claims and at least 19 veins and 25 pits and trenches were found when the property was mapped in 1948. In the vicinity of the shaft are 2 sets of quartz veinlets in the granite. These strike N.16°W. and N.60°E. respectively. Aplite dikes, also cutting the granite, strike N.38°W. In addition to the quartz veins, several sulphide zones composed largely of pyrite occur in the Keewatin lavas. On the contacts of these zones, the lavas are usually sheared, carbonatized, and silicified.
Sampling Results	Two bulk samples, each over 1½ tons in weight, were run through a pilot mill at the University of Toronto in 1938 and gave gold values of \$2.63 and \$2.76 per ton. (J. S. Crosscombe, 1941)
References	O.D.M. Vol. XXX, 1921, pt. 6, p. 14. O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 103. O.D.M. Vol. LXVI, 1957, pt. 5, p. 40. Report by J. S. Crosscombe (1941) in O.D.M. Resident Geologist's files, Kirkland Lake.
Remarks	The charter of Planet Gold Mines Ltd. was cancelled in 1958.

QUEENSTON GOLD MINES LTD.

Location	The original property consisted of a group of 13 patented claims immediately south of the town of Dobie in the south-central part of Gauthier township. The claim numbers are: L.4239, L.5732, L.8116, L.8366, L.8471, L.8807, L.8980, L.9505, L.9613, L.9614, L.9615, L.19189, L.19262.
Chief Metal Present	Gold.
History and Development	Queenston Gold Mines Ltd. was incorporated in 1941 under the direction of Upper Canada Mines Ltd. whose holdings adjoin the Queenston ground to the north. The company took over 8 claims from Murphy Mines Ltd. These claims constitute the east half of the property. To these claims were added 3 claims to the northwest from Upper Canada Mines Ltd., and 2 claims to the west from Anoki Gold Mines Ltd., thus making a total of 13 claims in the Queenston group. In 1928, Murphy Mines did some diamond-drilling and sank a shaft (Queenston No. 1) to a depth of 650 feet on claim L.9613. A second shaft, known as the "Margueratt" (Queenston No. 2), was sunk to about 100 feet deep on claim L.8366, southwest of No. 1. About 2,000 feet of lateral work was done on the 600-foot level from the No. 1 shaft; most of this development was a crosscut driven west of south into the area underlying the No. 2 shaft. Diamond-drilling by Queenston Gold Mines in 1941 in the vicinity of the Margueratt (No.2) shaft soon revealed ore possibilities. A mining plant was installed and the No. 2 shaft was deepened. The ore zone was explored

on the 125-foot and 250-foot levels. The mine was closed in April 1942 for the duration of the war.

In 1946 the adjoining property of Anoki Gold Mines Ltd. was acquired, thus bringing the total number of claims in the Queenston group to 37.

Anoki shaft (Queenston No. 3), which had been sunk to a depth of 750 feet, had its underground workings dewatered and examined. A similar examination of the No. 1 (Murphy) shaft was made in 1947 and a new 3-compartment shaft (Queenston No. 4) was started 250 feet northwest of the No. 2 shaft. Considerable diamond-drilling from surface and underground was done in all the shaft areas. The new shaft (No. 4) was sunk to a depth of 722 feet and 3 levels were opened up before operations were suspended in 1948. Development was resumed in 1950 through the new No. 4 shaft and the No. 3 (former Anoki) shaft. Considerable lateral work and underground diamond-drilling was done before operations were suspended again in 1951.

Geology

The Larder Lake "break", representing the faulted contact between Timiskaming sediments and volcanics to the north and Keewatin volcanics to the south, trends north of west across the Queenston property. It consists of a 300-foot-wide zone of highly sheared and carbonatized rocks. It dips steeply southwest and passes through the area of No. 2 and No. 4 shafts. The carbonate rock forms a central core flanked on both sides by talc-chlorite schist. Gold values occur throughout the body of carbonatized rock in the vicinity of shafts Nos. 2 and 4, but only make ore where quartz-filled fractures occur within and adjacent to numerous narrow dikes of syenitic intrusives. In the No. 3 (former Anoki) shaft to the northwest, the dip of the "break" has flattened and is 30°SW.

Sampling Results

"Ore from development (through the No. 2 shaft) trucked to the Upper Canada plant for a mill test totalled 1,054 tons valued at \$6,178.75 with gold at \$35.00 an ounce." (Annual Report, Queenston Gold Mines Ltd., April 1942)

References

O.D.M. Vol. L, 1941, pt. 8, pp. 20, 21.
O.D.M. Vol LII, 1943, pt. 1, pp. 177, 178.
O.D.M. Vol. LXI, 1952, pt. 2, p. 67.
Canadian Mines Handbook, 1948, pp. 187, 188.
Canadian Mines Handbook, 1962, pp. 212, 213.

Remarks

Queenston Gold Mines Ltd. has acquired a number of outside properties and is controlled by Upper Canada Mines Ltd.

RITORIA GOLD MINES LTD.

Location

The property consists of a group of 17 patented claims in the southeast quarter of Gauthier township, east of the property of Queenston Gold Mines Ltd. The claim numbers are: L.458, L.529, L.813, L.814, L.815, L.854, L.1065, L.2569, L.2571, L.2690, L.2691, L.9204, L.9205, L.9296, L.9622, L.9623, L.9767.

Chief Metal Present

Gold.

History and Development

Ritoria Gold Mines Ltd. was incorporated in 1937 and acquired the 2 contiguous claim groups formerly owned by Ritchie Gold Mines Ltd. and Victoria Creek Gold Mines Ltd. About 1912 a shaft was sunk to a depth of more than 100 feet in the northwest corner of claim L.529 by Victoria Creek Gold Mines and a small amount of lateral work was done on the

40-foot and 100-foot levels. In 1929, Ritchie Gold Mines sank a shaft to a depth of 528 feet in the northwest corner of claim L.9296, and over 1,000 feet of underground development was carried out on the 500-foot level before the mine closed at the end of the year.

Consolidated Mining and Smelting Co. of Canada optioned the 2 properties in 1936 and re-examined the underground workings; a small amount of additional lateral work was done, and a considerable amount of surface and underground diamond-drilling was completed before operations ended in 1937. Ritoria Gold Mines Ltd. was then organized by Consolidated Mining and Smelting. This company drilled another 20 surface holes in 1944. Princeton Gold Mines Ltd., incorporated in 1947 to take over the Ritoria ground, did some diamond-drilling that year in another part of the property.

Geology

The Larder Lake sheared zone or "break", marking the southern contact of the Timiskaming series, strikes across the Ritoria property in a southeasterly direction. Carbonate rock or "dolomite" occurs in the "break" where it has not been interrupted by Algomian intrusives. The Timiskaming rocks consist of lavas, sediments, and pyroclastics. The projection of the Larder Lake "break" shows it passing south of the underground workings of the Ritchie shaft, and occurring close to the Victoria Creek shaft, where the zone of shearing and intense rock alteration (talcose schist) may be several hundred feet wide. Stockworks of quartz veins appear in the "dolomite" outcrops along the strike southeast of this shaft.

Sampling Results

According to the records of the Consolidated Mining and Smelting Co., some scattered gold values were obtained in surface drilling northeast of the Ritchie shaft in the general contact zone between sediments and acid Algomian intrusives. The same rock assemblage was traversed by the underground workings on the 500-foot level where some faulted zones were encountered but no ore was outlined.

References

O.D.M. Vol. XXXII, 1923, pt. 4, p. 83.
O.D.M. Vol. XXXIX, 1930, pt. 1, p. 122.
O.D.M. Vol. L, 1941, pt. 8, p. 22.
Canadian Mines Handbook, 1948, p. 339.
Diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

Idle since 1947.

ROGICK-ELLIOT-CLARK CLAIMS

Location

The property consisted of an east-west-trending strip of 5 patented contiguous claims in concession VI, Eby township; the claim numbers and locations are as follows (going from east to west):
L.8950 in the NE. $\frac{1}{4}$ of S. $\frac{1}{2}$ of Lot 4;
L.8803 in the NW. $\frac{1}{4}$ of S. $\frac{1}{2}$ of Lot 4;
L.18227 in the NE. $\frac{1}{4}$ of S. $\frac{1}{2}$ of Lot 5;
L.18837 in the NW. $\frac{1}{4}$ of S. $\frac{1}{2}$ of Lot 5.
L.18312 in the NE. $\frac{1}{4}$ of S. $\frac{1}{2}$ of Lot 6 ($\frac{2}{3}$ water);

Chief Metal Present

Gold.

History and Development

The discovery of angular pieces of gold-bearing quartz float led to the staking of the claims. Subsequent stripping and trenching exposed gold-bearing quartz-carbonate stringers cutting porphyry and greenstone on claim L.18227. During the winter of 1938-39, Pioneer Gold Mines drilled 5

holes from west to east with a dip of 45° in the south half of claim L.18227, and obtained a number of low gold values. In 1944 the property was optioned to Siscoe Gold Mines Ltd. and 4 holes were drilled in a north-south direction. Two of these were put down in Kenogami Lake near the small point of land on claim L.18312. No gold values of economic interest were found.

Geology

Intermediate and basic volcanics of Keewatin age occupy much the greater part of the property. These lavas have been intruded by a number of scattered irregular porphyry dikes. Most of the east half of the east claim (L.8950) of the group consists of intrusive diorite. On the north boundary of the adjoining claim (L.8803), outcrops of conglomerate of Timiskaming age are shown on O.D.M. Map No. 1946-1. The south contact between the Timiskaming sedimentary belt and the Keewatin lavas crosses the north half of claims L.8950 and L.8803 in an east-west direction.

References

O.D.M. Vol. LVII, 1948, pt. 5, p. 51.
Report by D. K. Burke (1939), and diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks

The west claim (L.18312) was acquired by Burtho Gold Mines Ltd. in 1947.

SAHTRAM GOLD MINES LTD.

Location

The property consisted of a group of 4 patented claims at the junction of highway No. 112 and highway No. 66, about 1 mile northeast of Swastika. The claim numbers are: L.1385, L.16477, L.16478, and L.16480. Part of the southeast claim (L.16478) is occupied by the Kirkland Lake cemetery.

Chief Metal Present

Gold.

History and Development

Sahtram Gold Mines Ltd. was incorporated in 1945 and acquired the property of the Trout Creek Gold Mining Co. Ltd. The latter company was established in 1927 to develop the claims. In the summer of 1928 a gold discovery was made in the southwest corner of claim L.16477. A shaft was sunk on the showing and about 200 feet of lateral work was done on the 76-foot level. In 1945-46, Toburn Gold Mines Ltd. optioned the property and drilled 16 surface holes with disappointing results. Some underground drilling was also done from the 76-foot level.

Geology

The claims are underlain by Keewatin volcanics, Timiskaming sediments and tuffs, and 2 main types of intrusives (augite porphyrite, and syenite porphyry). The north-trending Amikougami Creek fault offsets 2 parallel fault zones that strike north of east across the claims. The most northerly of these faults was indicated by a narrow mud seam in the underground workings and was traced northeastward by diamond-drilling. It probably represents the southwesterly extension of the Amalgamated Kirkland "break"; to the west, it has been traced along the Blanche River. The second fault lies about 600 feet southeast along the contact of the sediments and volcanics. Drilling across this fault in 1946 indicated a shear zone, about 100 feet in width, containing talc schist and green carbonates cut by narrow syenite dikes. This structure has all the characteristics of the Larder Lake fault that follows the main south contact of the Timiskaming series.

Production

One ton of ore, containing gold to the value of \$1,622, was shipped from the property in 1931. (O.D.M. Vol. XLI, 1932, p. 9)

References

O.D.M. Vol. LVII, 1948, pt. 5, pp. 51, 52.
Report by E. W. Todd (1929), and diamond-drilling information in O.D.M.
Resident Geologist's office, Kirkland Lake.

Remarks

The charter of Sahtram Gold Mines Ltd. was cancelled in February 1958.

SYLVANITE GOLD MINES LTD.**Location**

The property consists of a group of 5 patented claims lying north and east of the Wright-Hargreaves property and west of the Toburn holdings in the eastern part of Teck township. The claim numbers are: L.2100, L.2101, L.2102, L.2226, L.2227.

Chief Metal Present

Gold.

**History and
Development**

The property was originally the Wright and Robbins claims on which considerable work was done in the early days of the camp without any very encouraging results. Sylvanite Gold Mines Ltd. was organized in 1913, and the success attained on neighbouring properties led to underground development. The property was acquired, from the English group that controlled it, by Buffalo interests in 1922. The main shaft, No. 2 in the north-central part of claim L.2100 (in the southeast corner of the property), was developed on various levels down to a paying horizon before 1927; then a 200-ton mill was built and the mine went into production. In 1929 the sinking of another shaft, No. 4, was started in the southeast corner of the southwest claim L.2101 (L.11378).

The property has a total of 5 shafts. No. 1 and No. 3 shafts were prospecting shafts sunk to depths of 130 feet and 125 feet respectively. No. 2, the main production shaft, extends to a depth of 3,642 feet and serviced 28 levels. No. 4 shaft goes to a depth of 1,762 feet. No. 5 shaft starts at the 3,150 foot level where it is connected to No. 2 shaft 1,250 feet east. It goes to the bottom of the workings at 5,605 feet and provided for the opening of 16 levels.

Production was continuous from 1927 to 1961 when operations ceased. During the life of the mine, underground development amounted to almost half a million feet.

Geology

The Sylvanite mine is the second from the east of the 7 mines on the main ore zone at Kirkland Lake. The surface geology of the property is shown on the map of Teck township (O.D.M., No. 1945-1), where it can be seen that the southern part is occupied by part of the main stock of Algoman syenite porphyry in the Kirkland Lake camp. To the north is a complex mixture of sediments (Timiskaming) and intrusions flanking the main intrusive body. A band of tuffs lies north of sediments that consist of greywacke and conglomerate. The northern intrusives consist of syenite porphyry and augite syenite, both of which occur in the form of dikes that trend about N.20°E., parallel to the long axis of the main porphyry stock.

The strongest and most continuous break in the mine is the zone of maximum displacement of the Kirkland Lake fault near the south side of a 1,500-foot-wide zone of pre-ore faulting and fracturing. Most of the fractures dip south, some steeply and others at flatter angles. Veins are found in all rock formations within the fractured zone and pass from one rock type into another without any apparent change in strength. The ore shoots were not continuous over great distances but were a series of bodies having irregular outlines. The Kirkland Lake fault dips south in the upper part of the mine but swings through the vertical and continues with a north dip below the 3,000-foot level. The movement was south side up.

Several post-ore strike faults in the mine dip to the north. The general direction of movement along this set of faults was north side up. Crossfaults, the most important of which were named the K and the Sylvanite, displace the strike faults.

Production Total production from Sylvanite Gold Mines Ltd. from 1927 to 1961 inclusive amounted to \$56,596,502 from 5,049,446 tons of ore milled. (Canadian Mines Handbook, 1962, p. 242)

References O.D.M. Vol. XXIII, 1914, pt. 1, p. 170.
O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 134-140.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 177-183.
Geological plans in O.D.M. Resident Geologist's files, Kirkland Lake.
Structural Geology of Canadian Ore Deposits, Vol. I, Canadian Inst. Min. Met., Geology Division, 1948, pp. 644-653.
Canadian Mines Handbook, 1961, p. 234.
"Three Miles of Gold" by S. A. Pain. The Ryerson Press, Toronto.

Remarks All interests sold, assets distributed to the shareholders, and charter surrendered in 1962.

TECK-HUGHES GOLD MINES LTD.

Location The main property consists of a group of 9 patented claims and one fraction in the central section of the Kirkland Lake camp. This group lies between the Lake Shore property on the east and the Kirkland Lake Gold and Macassa properties on the west. The claim numbers are: L.16624, L.16625, L.16626, L.1238, L.1239, L.1240, L.1824, L.1825, L.7408. Fraction: L.29604.

Chief Metal Present Gold.

History and Development The first 3 claims listed above were staked by Stephen Orr early in 1911 and later became the most important part of the Teck-Hughes mine. In the spring of the same year, John Reamsbottom staked another 3 claims (L.1238, L.1239, L.1240) adjoining the Orr property. These claims were subsequently acquired by James Hughes. Sandy McIntyre, working for Hughes, made a gold discovery on claim L.1238 near the west shore of Kirkland Lake; Teck-Hughes Gold Mines Ltd. was incorporated in 1913 to acquire the Hughes claims. The property was optioned in 1914 by the Nipissing Mining Co., and the sinking of the No. 1 shaft was started on the McIntyre discovery vein. The option was dropped by the Nipissing Mining Co. early in 1915 and was taken up by Charles Dennison and associates of Buffalo later in the same year. By the end of 1916, the No. 1 shaft had reached a depth of 500 feet, and a 50-ton mill was installed. The adjoining Orr claims on the south were optioned in 1917 by the Kirkland Porphyry Co., and a shaft was sunk to a depth of 400 feet on a vein in a structure later shown to be the Kirkland Lake "Main" break. Teck-Hughes Gold Mines Ltd. acquired the Orr property in 1923, thus giving the company a full quarter mile along the Main break, and assuring protection on the south dip.

The mine has been developed on 50 levels from 4 shafts and 6 winzes to a depth of 6,182 feet. Production has been continuous from 1917 to date. It attained a maximum in 1932 when 475,700 tons of ore, valued at \$6,631,755, were milled. Operations have been on a salvage basis since 1951.

Geology O.D.M. Map No. 1945-1 shows the rock formations exposed at surface on the main Teck-Hughes property to consist of sediments intermingled with tuffs of Temiskaming age and elongate bodies of Algoman intrusives. It

can be seen that north of the Main break at surface, these formations strike approximately parallel to it (N.65°E.), but south of the fault system the strikes are roughly N.80°E. Most of the mine workings are in the intrusives.

The main intrusive body is an irregularly shaped mass, sill-like in general outline, and consisting of augite syenite intermingled with syenite and syenite porphyry intruded in the order given. The syenite is confined to the upper levels and is part of the faulted westward-pitching pipe-like body that crosses the neighbouring Kirkland Lake Gold and Macassa properties. The augite syenite and syenite porphyry are intricately inter-fingered throughout the entire mine. Because the proportion of syenite porphyry to augite syenite in the vicinity of the Main break increases with depth, most of the workings in the lower half of the mine are in syenite porphyry. A diabase dike about 80 feet wide strikes north-south across the property and dips 75°W. It cuts all the rock types, veins, and ore bodies but has been offset by later faulting movements on the Main and subsidiary breaks.

The most important structure in the mine is the Kirkland Lake fault or Main break, which dips 75°-80°S. The bulk of the gold production has come from the No. 3 vein system associated with this fault. The Teck-Hughes veins generally contain quartz although the amount may vary greatly.

Most of the subsidiary veins branch off the hanging wall of the main fault and have a flatter dip than the main structure. An exception is the No. 1 vein discovered by Sandy McIntyre. It appears in outcrops about 100 feet north of the main fault and joins it at depth. About 600 feet south of the main fault, a parallel structure occurs; it is called the No. 4 break and is generally considered to be the westerly extension of the South (No. 1) vein from the Lake Shore mine, but it has produced no ore in the Teck-Hughes mine. Another prominent structure is the No. 6 break in the west end of the mine. This is a continuation of that structure from the Kirkland Lake Gold mine.

The veins and ore bodies are not greatly disturbed by post-ore movement. Where displacement occurs, the offset is never more than 45 feet.

Total production from Teck-Hughes Gold Mines Ltd., from 1917 to 1962 inclusive, amounted to \$101,083,243 from 9,174,669 tons of ore milled. (Figures supplied by O.D.M. Statistician.)

References

- O.D.M. Vol. XXIX, 1920, pt. 4, pp. 29-32.
O.D.M. Vol. XXXII, 1923, pt. 4, pp. 31-34.
O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 98-111.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 141-149.
O.D.M. Vol. LXX, 1961, pp. 37, 60-62.
Structural Geology of Canadian Ore Deposits, Vol. I, Canadian Inst. Min. Met., Geology Division, 1948, pp. 644-653.
Canadian Mines Handbook, 1959, p. 219.
"Three Miles of Gold" by S. A. Pain. The Ryerson Press, Toronto.

Remarks

Control of Teck-Hughes Gold Mines Ltd. was acquired by the Keevil Mining Group Ltd. in 1959. The mining rights of the former Kirkland Lake Gold property, adjoining Teck-Hughes, were purchased by the company in 1960.

TEGREN GOLD MINES LTD.

Location

The main group consists of 14 patented claims lying immediately west of the property of Macassa Mines Ltd. in Teck township. The claim numbers are:

L.1525, L.2762, L.2763, L.2764, L.2831, L.5045, L.5049, L.5343, L.5926, L.5927, L.5928, L.5929, L.5967, L.5980.

Tegren also holds 2 patented claims, L.2947 and L.2948, lying between the Goldbanks and McIvor properties, and another group of 4 claims, L.2929, L.2930, L.2931, and L.7216, at the east end of Elsie Lake. The properties are all in Teck township.

Chief Metal Present Gold.

History and Development

The Tegren properties were acquired in the early years of the camp by the late Harry Oakes. They are still part of the Oakes estate. Three of the Elsie Lake claims were taken over from Brown Gold Mines; the other 2 groups were acquired from the original stakers. The main group was known as the Oakes property until Tegren Gold Mines Ltd., a private company, was formed to incorporate all the holdings. The claims have been developed by surface prospecting. On the main group a limited amount of shallow drilling was done along the Kirkland Lake fault.

Geology

All the Tegren ground lies within the belt of Timiskaming sediments, except the northwest corner of claim L.2948, where pillow-lava outcrops of Keewatin age occur. The sediments are cut by a considerable number of dikes and irregularly shaped bodies of syenite porphyry and basic syenite. The most interesting feature of the Tegren claims is the Kirkland Lake fault, which has been traced on the main group from the Macassa boundary west to Amikougami Creek, where it is offset southward by a crossfault. A parallel zone of faulting has been found about 500 feet north. It extends into the property on claim L.2762.

References

O.D.M. Vol. XXXVII, 1928, pt. 2, see map facing p. 94.
O.D.M. Vol. LVII, 1948, pt. 5, p. 52.

Remarks

Gold-bearing quartz veins, now being mined on the lower levels of the neighbouring Macassa mine, continue into Tegren ground.

TOBICO GOLD MINES LTD.

Location

The property consists of a group of 3 patented claims adjoining the holdings of Upper Canada Mines Ltd. in Gauthier township. The claim numbers are: L.9232, L.9531, L.9532. Dobie townsite is located on claims L.9531, L.9532.

Chief Metal Present Gold.

History and Development

In 1921, Messrs. Tobico and Perry found gold near the northwest corner of claim L.9532, and a prospect shaft was sunk to a depth of 25 feet. Tobico Gold Mines Ltd. was incorporated in 1923. By 1928 the company had acquired a considerable number of additional claims to the north. Most of these were taken over in 1929 by East Main Gold Mines Ltd., and subsequently by Upper Canada Mines Ltd. Three of the adjoining Tobico claims were acquired by Brock Gold Mines Ltd. in 1938. Brock, in turn, was taken over by Upper Canada in 1946. Diamond-drilling was done on the Tobico property during the winter of 1941-42 and was resumed in 1944. A new drilling program was undertaken in 1950 but no gold values of economic significance were reported from any of the drilling operations.

Geology

The claims lie within the regional belt of Timiskaming sediments, volcanics, and pyroclastics; but they are largely drift covered. In the southeast corner of the property (claim L.9232) is a ridge of trachytic agglomerate and tuff; north of this outcrop, across the swamp, conglomerate and grey-wacke are exposed. An area of intrusive syenite and syenite porphyry

occurs in the northern parts of claims L.9531 and L.9532. The shaft was sunk on a narrow quartz vein in an outcrop of red feldspar porphyry. It exposed an east-west fault containing quartz stringers containing medium to low values in gold.

Sampling Results	Assays of the drill cores consistently produced low or zero gold values. The best intersection gave \$3.15 over 2.7 feet. (G. F. Flaherty)
References	O.D.M. Vol. XXXII, 1923, pt. 4, p. 83. O.D.M. Vol. L, 1941, pt. 8, pp. 22, 23. Canadian Mines Handbook, 1951, p. 193. Reports by B. S. W. Buffam (1944) and G. F. Flaherty (1944) with diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.
Remarks	The company was reorganized in 1949 and the name changed to Tobico Consolidated Gold Mines Ltd.

TOBURN GOLD MINES LTD.

Location	The property consists of a group of 10 patented claims straddling the Teck-Label township line at Milepost 4. The claim numbers are: Teck township: L.1822, L.1823, L.2375, L.2376. Label township: L.1821, L.2372, L.2373, L.2374, L.2377, L.2378.
Chief Metal Present	Gold.
History and Development	<p>Toburn Gold Mines Ltd. was incorporated in 1931 as a subsidiary of the Premier Gold Mining Co. Ltd. under the management of the American Smelting and Refining Co. Ltd. It acquired the option held by Bunker Hill Extension Mines Ltd. on the Tough-Oakes-Burnside property at the east end of the Kirkland Lake camp.</p> <p>Rich surface discoveries of gold were made on the Tough-Oakes claims in 1912. These claims were later amalgamated with the Burnside property to the south. Tough-Oakes-Burnside became the first producing mines in the vicinity of Kirkland Lake.</p> <p>The Toburn property has 4 shafts. The main opening is No. 3 in the northwest corner of claim L.1823. It has been sunk below the 1,090-foot level.</p> <p>A shaft was extended from this level to the 2,475-foot level. In all, 21 levels were opened. In addition to development within the mine, long crosscuts and drifts were driven into neighbouring properties in which Toburn Gold Mines Ltd. had an interest.</p> <p>Production by Toburn began in 1932 and was continuous until 1953 when the mine closed.</p>

Geology	<p>The Toburn ground is the most easterly of the 7 contiguous mining properties on the Main ore zone at Kirkland Lake. The surface geology is shown on the maps of Teck township (O.D.M. No. 1945-1) and Label township (O.D.M. No. 53a, dated 1944). The claims cover the east end of the main stock of Algomian syenite porphyry in the Kirkland Lake camp. The porphyry intrudes the Timiskaming sediments and tuffs, the latter predominating toward the east. Other intrusives are dike-like bodies of augite syenite and quartz-feldspar porphyry. A few small minette dikes occur in the northwest corner of the property, and a near-vertical diabase dike about 8 feet wide trends north-south through the mine workings.</p> <p>The Toburn mine lies at the east end of the Kirkland Lake vein-fault and vein-fracture system. In passing eastward through the main syenite porphyry</p>
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stock the displacement on the various branches of the Kirkland Lake fault either decreases or dies out completely. The main south branch of the Kirkland Lake fault system is the strongest and most persistent structure in the Toburn mine. It is locally called the South vein. It dips steeply south and the south side has been thrust upward (vertically) about 350 feet. This fault is on the hanging-wall side of a fracture system about 1,500 feet in maximum width extending slightly north of east across the western part of the property. This fracture system contained most of the gold-bearing veins. It has a general southerly dip but individual breaks may range from a vertical to an almost horizontal position. The ore shoots were numerous but generally small. The widths of the veins in which all the gold values were concentrated were generally less than 8 inches. The ore bodies in the porphyry were, on the whole, wider than those in the sediments. Post-ore strike faults occur; also present are 2 main post-ore cross faults known as the Dike fault and the O'Connell Lake fault.

Production

Production by the Tough-Oakes-Burnside mine prior to the incorporation of Toburn Gold Mines Ltd. amounted to \$2,909,597 from 290,477 tons of ore milled.

Total production from the mine, including the Tough-Oakes-Burnside figures, from 1913 to 1953 amounted to \$17,738,506 from 1,186,316 tons of ore milled. (O.D.M. Vol. LXIV, 1955, pt. 1, p. 14)

References

O.D.M. Vol. XXXVII, 1928, pt. 2, pp. 141-147.

O.D.M. Vol. XLI, 1932, pt. 1, p. 91.

O.D.M. Vol. LVII, 1948, pt. 5, pp. 184-188.

O.D.M. Vol. LXIII, 1954, pt. 2, pp. 96, 97.

Structural Geology of Canadian Ore Deposits, Vol. I, Canadian Inst. Min. Met., Geology Division, 1948, pp. 644-653.

"Three Miles of Gold" by S. A. Pain. The Ryerson Press, Toronto.

Remarks

In August 1953 the property and assets of Toburn Gold Mines Ltd. were acquired by Albert Metals Ltd., a subsidiary of Ascot Metals Ltd. Subsequently the property was turned over to the Arcadia Nickel Corporation Ltd. This company arranged to have Sylvanite Gold Mines Ltd. drift into the Toburn property from the west on the 5,500-foot level in 1956-57. Arcadia Nickel Corporation Ltd. was reorganized in 1959 and became Associated Arcadia Nickel Corporation Ltd.

UPPER CANADA MINES LTD.

Location

The property consists of a group of 46 patented claims occupying the central part of Gauthier township. The claim numbers are: L.S.500, L.S.501, L.S.502, L.S.503, L.S.504, L.6314, L.6315, L.6316, L.6317, L.6318, L.6319, L.6321, L.8113, L.8114, L.8115, L.8371, L.8372, L.8590, L.9094, L.9095, L.9224, L.9225, L.9226, L.9227, L.9312, L.9365, L.9524, L.9525, L.9526, L.9527, L.9528, L.9529, L.9530, L.10140, L.10141, L.10142, L.10143, L.10144, L.10145, L.10462, L.10463, L.11520, L.11521, L.11522, L.15584, L.15585.

Chief Metal Present

Gold.

History and Development

Upper Canada Mines Ltd. was incorporated in 1929 and acquired the property of East Main Gold Mines Ltd. The latter company had sunk a shaft (Upper Canada No. 1) in the northwest corner of claim L.6314 to a depth of 134 feet with a level at 125 feet. A vein zone, later known as the "M" orebody, was exposed on this level.

	<p>The mine was reopened in 1936 and its "H" vein zone was discovered by surface diamond-drilling in 1937. The No. 1 shaft had been deepened to 1,000 feet with levels at 125-foot intervals by 1941.</p> <p>The same year a second shaft (No. 2) was started in order to develop the "L" vein zone 1,500 feet west; this shaft eventually bottomed below the 1,750-foot level. By 1960, 28 levels had been opened from the No. 1 shaft (the deepest being at 3,625 feet) and a subshaft below No. 1 had reached the 4,950-foot horizon. This shaft was deepened in 1961 and 1962 to 5,289 feet. Both the No. 1 and No. 2 shafts are connected by underground workings on the 375-, 1,000-, and 1,750-foot levels.</p> <p>The adjoining properties, west of Brock Gold Mines Ltd. and Eastward Mines Ltd., were acquired in 1946, and the Scott-Chibougamau ground to the east was taken over in 1958, thus bringing the number of claims in the Upper Canada group to a total of 46.</p>
Geology	<p>The property lies almost entirely within the regional belt of Timiskaming sediments, volcanics, and pyroclastics; the exception is the northeast corner where Keewatin rocks are exposed. The Timiskaming rocks have been intruded by porphyries of Algomian age and by later diabase dikes.</p> <p>A wide zone of schistosity strikes slightly north of east through the centre of the property. The core of this zone is occupied by the Upper Canada "break", which is a system of narrow gouge-filled fractures in highly altered tuff, trachyte, trachyte porphyry, and syenite porphyry.</p> <p>The initial stages of alteration were marked by carbonatization and sericitization, followed by silicification and the introduction of minor amounts of sulphide minerals. Gold was finally deposited in relatively late fractures in silicified zones and pyrite. The Upper Canada "break" and the vein zones have in general a vertical dip. Orebodies occur in 6 main vein zones: the L, H, B, C, M, and K. The "L" zone, the strongest and most productive ore structure in the mine, is continuous from surface through the deepest levels.</p>
Production	<p>Vein zones and percent of total ore mined to the end of 1961: L—66.8; B—16.6; H, M, and Q—13.8; C and K—2.8.</p> <p>Total recovery to the end of 1961 amounted to 911,262 ounces of gold and 416,718 ounces of silver from 3,200,557 tons of ore. (D. W. Tully, 1962)</p>
References	<p>O.D.M. Vol. XLVI, 1937, pt. 1, p. 214.</p> <p>O.D.M. Vol. L, 1941, pt. 8, pp. 23-26.</p> <p>Canadian Mines Handbook, 1958, pp. 265, 266. Canadian Inst. Min. Met., Bulletin, January 1963. (Report by D. W. Tully)</p> <p>Report by G. L. Holbrooke, 1938, etc., in O.D.M. Resident Geologist's files, Kirkland Lake.</p>
Remarks	<p>Upper Canada Mines Ltd. has a number of outside interests and controls several properties including Queenston Gold Mines Ltd.</p>
VENTURA KIRKLAND MINES LTD.	
Location	<p>This company held a group of 5 patented claims immediately northeast of Swastika townsite in Teck township. The claim numbers as shown on O.D.M. Map 1945-1 are: L.4485, L.4486, L.6833, L.6866, L.16031.</p>
Chief Metal Present	<p>Gold.</p>
History and Development	<p>Ventura Kirkland Mines Ltd. was incorporated in 1928. The same year a gold discovery was made on the adjacent property of Trout Creek Gold Mines</p>

(later Sahtram) about 50 feet from the Ventura-Kirkland boundary. Following this discovery, Teck-Hughes Gold Mines Ltd. optioned the Ventura-Kirkland property and explored it on the surface and by 8 diamond-drillholes, but nothing of importance was found.

Geology

The rocks on the claims consist of Timiskaming sediments and tuffs except South of the fault in the southeast claim, L.4486, where andesite of Keewatin age is exposed. The sediments are cut by a body of syenite porphyry in the central section of the property and by augite porphyrite on the northwest claim. A diabase dike extending northwest from the highway was intersected in the drillholes.

The fault in the Sahtram underground workings extends in a southwesterly direction across the Ventura Kirkland property and then swings west along the Blanche River. The porphyry adjacent to the fault is altered and sheared. Narrow quartz veins are found in the altered porphyry and adjacent sediments. These carry small quantities of pyrite, chalcopyrite, molybdenite, galena, and traces of gold. Another strong southwestward-trending fault intersected by drilling under Amikougami creek on claim L.4486, is considered to be part of the Larder Lake fault that lies along the south margin of the Timiskaming series. Another fault found near the bottom of the hole is probably the Amikougami Creek crossfault that strikes in a north-south direction.

Grade

According to a report on the property by R. J. Henry in 1928, the highest reliable assay obtained from surface sampling was 0.1 ounces of gold per ton. The drilling operations did not yield any encouraging gold values.

References

O.D.M. Vol. LVII, 1948, pt. 5, p. 52.
Diamond-drilling information in O.D.M. Resident Geologist's office, Kirkland Lake.

Remarks

The charter of Ventura Kirkland Gold Mines Ltd. was cancelled in 1956.

WALTERS PROPERTY

Location

A group of 9 patented claims at the east end of Kenogami Lake immediately south of the Rogick-Elliot-Clark holdings in Eby township. The claim numbers are: L.9846, L.9848, L.16740, L.16750, L.17402, L.17403, L.17404, L.17715, L.19129.

Chief Metal Present

Gold.

History and Development

Charles J. Walters patented, in 1917, the 3 claims (L.17402, L.17403, L.17404) on which most of the subsequent work was done. The rest of the claim group, with the exception of L.17715 and L.19129, were acquired by 1920. Claim L.17715 was acquired and patented in 1932 and claim L.19129 in 1934.

Erie Canadian Mines Ltd., a subsidiary of Sylvanite Gold Mines Ltd., optioned and prospected the property in 1935. Several quartz veins on the 2 north claims, L.17402 and L.17403, were sampled and one gold assay of \$6.00 per ton was reported. The property and the adjoining Reed claim L.9832, were developed in 1938 by D. M. Hogarth and associates. Surface work indicated the presence of gold on claim L.17404. Eight drillholes totaling about 3,000 feet were put down to test the carbonate areas.

Geology

Outcrops on the property consist of basic volcanics, green carbonates, and a few syenite and lamprophyre dikes. The carbonate zone on the south

boundary of claim L.17402 lines up with other carbonate outcrops along a zone striking S.70°E., which is probably a regional fault. Drilling indicated a zone of talc schist underlying the creek valley immediately north of the carbonate body on claim L.17402.

Sampling Results According to T. L. Wells, engineer in charge of development in 1938, bulk samples from the No. 1 trench, at the east end of the carbonate body on claim L.17404, gave returns of 2.74 ounces and 0.06 ounces of gold per ton from narrow quartz stringers containing finely divided visible gold. A drillhole under this trench failed to reveal interesting values; some of the other holes gave low values.

References O.D.M. Vol. LVII, 1948, pt. 5, pp. 52, 53.
Sampling information from Erie Canadian Mines Ltd. in O.D.M. Resident Geologist's files, Kirkland Lake.

WRIGHT-HARGREAVES MINES LTD.

Location The property consists of a group of 3 contiguous patented claims lying between the Sylvanite holdings to the north and east and the Lake Shore property to the west, and a fourth claim (L.1831) adjoining the Sylvanite property. The claim numbers are: L.2103, L.1829, L.1830, L.1831.

Chief Metal Present Gold.

History and Development The first gold discovery in the vicinity of Kirkland Lake was made in 1911 by W. H. Wright on claim T.C.709 (L.1830) in the "Main break" or Kirkland Lake fault. In 1913 the Cartwright interests found another vein 550 feet north and sank a shaft (No. 1) on it to a depth of 60 feet before dropping their option. Wright-Hargreaves Mines Ltd. was incorporated in 1916 and 2 shafts were started 950 feet apart on the main vein. A mill was built and started production in 1921 at the rate of 175 tons per day. Milling was continuous until 1957, reaching a maximum of 1,200 tons per day in 1940. In 1931 a new shaft, the central or No. 4 shaft, was started. This shaft eventually reached a depth of 4,000 feet and became the main production shaft of the mine.

The property has been explored and developed on many levels on both the north and south zones. No. 5 winze (below the 3,600-foot level) and No. 6 winze (below the 7,200-foot level) took the workings to a depth of 8,222 feet. In 1956, Wright-Hargreaves Mines Ltd. and the adjoining Lake Shore property came under the control of Little Long Lac Gold Mines Ltd. The Wright-Hargreaves mill ceased operations in 1957. Since that date the ore has been treated in the Lake Shore mill.

Geology The surface geology of the Wright-Hargreaves property is shown on the map of Teck township (O.D.M., No. 1945-1). With the exception of the northwest corner, the group of 3 claims lying along the Kirkland Lake fault is entirely occupied by part of the main stock of Algoman syenite porphyry in the Kirkland Lake camp. In addition to the syenite porphyry, the main rock types in the mine are Timiskaming conglomerate and greywacke, and Algoman augite syenite.

The strongest structure on the property is the Kirkland Lake fault which on surface passes, with a strike of N.67°E., through the centre of the 3 claims and through the syenite porphyry stock. In section the fault closely parallels the north contact of this rock. In spite of a southerly dip in part of its downward course, post-ore faults have moved this major structure

northward, so that at depth the fault is still almost vertically beneath its position on the surface. Other ore-bearing structures are found not only in faults that have branched off the Kirkland Lake fault but also in parallel faults and tension fractures. Fissure-filling gold-bearing quartz veins are the most common; the larger ore bodies on the various faults are of this type. Lodes, stockworks, breccia, and gash veins are found on subsidiary structures.

Numerous post-ore faults occur on the property. The strike faults and transverse faults have different characteristics. Most of the strike faults dip north and show shearing and a filling of late quartz and calcite. On the transverse faults, brecciation is seen rather than shearing, and gouge is often present; but deposition of quartz and calcite on them is uncommon. The Lake Shore transverse fault, which enters the property in the southwest corner with a strike slightly east of north, is the most important post-ore fault.

Although much ore was mined from the Kirkland Lake fault, the most productive structure has been the North vein branching off the north side of the main fault just west of the Wright-Hargreaves property.

Production

Three tons of ore from the North vein, valued at \$1,127 were shipped in 1913. From 1921 to 1962 inclusive, production amounted to 9,478,812 tons of ore valued at \$153,145,459. (Figures supplied by O.D.M. statistician.)

References

O.D.M. Vol. XXXII, 1923, pt. 4, pp. 39-41.
O.D.M. Vol XXXVII, 1928, pt. 2, pp. 125-133.
O.D.M. Vol. LVII, 1948, pt. 5, pp. 161-176.
O.D.M. Vol. LXVII, 1958, pt. 2, pp. 98-101.
O.D.M. Vol. LXX, 1961, pp. 64, 65.
Structural Geology of Canadian Ore Deposits, Vol. I, Canadian Inst. Min. Met., Geology Division, 1948, pp. 644-653.
"Three Miles of Gold" by S. A. Pain. The Ryerson Press, Toronto.

Remarks

The workings on the 8,100-foot level at the Wright-Hargreaves mine are the deepest in the world below sea-level.

MISCELLANEOUS — GOLD PROPERTIES

Property	Townships	References	Metal
Alpha Larder Mines Ltd.	McVittie	O.D.M. Map No. 50b. Canadian Mines Handbook, 1944, p. 203	Gold
American Kirkland	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94.	"
Anderson, Wm.	McElroy	O.D.M. Vol. LIX, 1950	"
Anglo-Canadian Explorers (Imerson)	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 20	"
Anglo-Swift Gold Mines Syndicate	Boston	Canadian Mines Handbook, 1945, p. 16	"
Ansara, M.	Teck; Bernhardt	O.D.M. Vol. XXX, 1921, pt. 6, pp. 59, 60. Resident Geologist's files, Kirkland Lake	"
Arc Mining Syndicate	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 23.	"
Artben Mining Syndicate	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30.	"
Arthur-Costello	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21.	"
Asher Gold	Grenfell	Canadian Mines Handbook, 1946, p. 22	"
Aurora Larder	Boston	O.D.M. Vol. LIX, 1950, pt. 6, p. 57	"
Avalard	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 15.	"
Avery, R. W.	McFadden	Resident Geologist's files, Kirkland Lake	"
Barsleau	Hearst; McVittie	Resident Geologist's files, Kirkland Lake	"
Bear Lake	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 89.	"
Beauregard, A.	Gauthier	O.D.M. Vol. L, 1941, pt. 8, pp. 15, 16.	"
Bell	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30.	"
Belrosa	Lebel	Resident Geologist's files, Kirkland Lake	"
Bennett-Pacaud	Pacaud	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 30, 46.	"
Biltmore	McVittie	Resident Geologist's files, Kirkland Lake	"
Bird, S. J.	Gauthier	Resident Geologist's files, Kirkland Lake	"
Bird, S. J.	Teck	Resident Geologist's files, Kirkland Lake	"
Biroco	Lebel; Gauthier	Resident Geologist's files, Kirkland Lake	"
Blaugrund	Gauthier	Resident Geologist's files, Kirkland Lake	"
Blaugrund	Teck	Resident Geologist's files, Kirkland Lake	"
Boisvert	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Boland, C.	Lebel	Resident Geologist's files, Kirkland Lake	"
Boland, C.	Teck	Resident Geologist's files, Kirkland Lake	"
Bonnier	McElroy	Resident Geologist's files, Kirkland Lake	"
Bos, A.	Hearst	Resident Geologist's files, Kirkland Lake	"
Bos, A.	McVittie	Resident Geologist's files, Kirkland Lake	"
Boston Creek Mining	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 32.	"
Bouzan	Lebel	O.B.M. Vol. XXII, 1913, pt. 1, p. 54	"
Boyd Kirkland	Lebel	O.D.M. Vol. XLVI, 1937, pt. 1, p. 106.	"
Bradstreet Larder Lake Mining Syn.	McVittie	Resident Geologist's files, Kirkland Lake	"
Brant	Lebel; Gauthier	O.D.M. Vol. XXXII, 1923, pt. 4, p. 75	"
Brant Syndicate	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Brown, Rosa	Eby	Resident Geologist's files, Kirkland Lake	"
Brubaker, M., Syndicate	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 23.	"
Bruce	McVittie	O.D.M. Map No. 50b.	"
Burbank-Raymore Syndicate	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 57.	"
Burton	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 23.	"
Calcora Mining and Developing Syn.	Teck	Resident Geologist's files, Kirkland Lake	"
Campbell, A. E.	Grenfell	O.D.M. Map. No. 1946-1.	"
Campbell, Dunc.	McVittie	Resident Geologist's files, Kirkland Lake	"
Canada First (Granow)	Lebel	O.B.M., Vol. XXIV, 1915, pt. 1, p. 145	"
Capitol Rouyn Gold	McGarry	O.D.M. Map No. 50a.	"
Caplan	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 76.	"
Carbonate Larder	McGarry	Resident Geologist's files, Kirkland Lake	"
Carr	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 20.	"
Carroll Hefferman	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Casteck	Teck	Resident Geologist's files, Kirkland Lake	"
Catharine Lebel	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94.	"
Chaput	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94.	"
Charest	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, pp. 44, 45.	"
Chavigny Gold	Otto	Resident Geologist's files, Kirkland Lake	"
Cheltonia Gold (Todora)	Otto	Resident Geologist's files, Kirkland Lake	"
Collins	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 35.	"
Columbus-Kirkland	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Combined Goldfields	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 24.	"
Cochrane	Otto	Resident Geologist's files, Kirkland Lake	"
Combined Larder	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 24.	"
Comfort-Kirkland	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94.	"
Coniagas (Johnson)	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, pp. 20, 21	"
Connell	Catharine	O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 96.	"
Cook (Tyon)	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 29.	"
Corson	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 24.	"
Costello, Arthur	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21.	"
Cotter	Catharine	O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 103.	"
Crystal Extension	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"

Miscellaneous—Gold Properties (continued)

Property	Townships	References	Metal
Crystal Kirkland	Lebel	Resident Geologist's files, Kirkland Lake	Gold
Cumming	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 45	"
Currie	Boston	O.D.M. Vol. LXXVI, 1957, pt. 5, p. 45	"
Cusiagau Syndicate	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Dalby-Larder	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 63	"
Darmac	Lebel	Resident Geologist's files, Kirkland Lake	"
Deacon	McElroy	Resident Geologist's files, Kirkland Lake	"
Dion	Hearst	Resident Geologist's files, Kirkland Lake	"
Dominion Gold Leaf Syndicate	Hearst	Resident Geologist's files, Kirkland Lake	"
Dominion Gulf Co., Group 1	Boston	O.D.M. Vol. LXXVI, 1957, pt. 5, p. 35	"
Dominion Gulf Co.	Eby	Resident Geologist's files, Kirkland Lake	"
Dominion Kirkland	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Donaldson	Gauthier	Resident Geologist's files, Kirkland Lake	"
Donnell and Myles	Lebel	O.D.M. Vol. XXXII, 1923, pt. 4, p. 70 O.D.M. Map No. 53a	"
Dream	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 2	"
Drummond	McGarry	Resident Geologist's files, Kirkland Lake	"
Duffett	Gauthier	Resident Geologist's files, Kirkland Lake	"
Duke	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Earl Gold	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 24	"
East Kirk	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Eastmont Larder Lake Gold	McGarry	Canadian Mines Handbook, 1946, p. 104	"
Elgo	Skead	Resident Geologist's files, Kirkland Lake	"
Elstone-Duncan	Gauthier	O.D.M. Vol. XXXII, 1923, pt. 4, p. 82	"
Empire Gold	Boston	Resident Geologist's files, Kirkland Lake	"
Erin Kirkland	Lebel	Resident Geologist's files, Kirkland Lake	"
Errowana Gold	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, pp. 45, 46	"
Evenlode	Lebel; Gauthier	Canadian Mines Handbook, 1939, p. 334	"
Evoy	Boston	O.D.M. Vol. LXXVI, 1957, pt. 5, pp. 35, 36 Resident Geologist's files, Kirkland Lake	"
Fidelity Mining and Development	Teck	O.D.M. Vol. XXIX, 1920, pt. 4, p. 46	"
Fisher Gold	Teck	O.D.M. Vol. XXVII, 1918, pt. 1, p. 102 O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Foley	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Fork Lake	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 19 Resident Geologist's files, Kirkland Lake	"
Foundation Consolidated	McVittie	Resident Geologist's files, Kirkland Lake	"
Gauthier M. (Scott-Chibougamau)	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 19	"
Gibson Gold	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Gill	Boston	O.D.M. Vol. LXXVI, 1957, pt. 5, p. 36	"
Gogita Mining Syndicate	Boston	O.D.M. Vol. LXXVI, 1957, pt. 5, p. 36 Resident Geologist's files, Kirkland Lake	"
Gold Bank (Kordol)	Catharine	O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 107	"
Gold Ridge (Kordol)	Catharine	O.D.M. Vol. XXXVIII, 1929, pt. 6, pp. 106, 107	"
Gold Leaf	Boston	O.D.M. Vol. LXXVI, 1957, pt. 5, p. 34	"
Goldwyn	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Gold King	Hearst	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 25	"
Grace Lake (LaFond)	Skead	O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 111	"
Gracie	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30	"
Graff-Kaplan-Hahn	Burt; Eby	Resident Geologist's files, Kirkland Lake	"
Grainger	McVittie	Resident Geologist's files, Kirkland Lake	"
Grainer-Yuill (Kir-Vit)	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 75	"
Granby-Kirkland	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Granow (Canada First)	Lebel	O.B.M. Vol. XXIV, 1915, pt. 1, p. 145	"
Grasset Lake	Lebel	Resident Geologist's files, Kirkland Lake	"
Great Larder	Hearst; McVittie	Resident Geologist's files, Kirkland Lake	"
Grenfell-Kirkland (Stitt)	Grenfell	Resident Geologist's files, Kirkland Lake	"
Gull-Kirkland	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Hall	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21	"
Harris	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 46	"
Hartford-MacClure	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 46	"
Hayes-Cadillac (Winchester)	McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 93	"
Haynes (Duffett)	Gauthier	Resident Geologist's files, Kirkland Lake	"
Hay Syndicate	McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 63 Resident Geologist's files, Kirkland Lake	"
Hay-Thompson	McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 63	"
Healy	Boston	O.D.M. Vol. LXXVI, 1957, pt. 5, p. 37	"
Hearst Larder (north group)	Hearst	Resident Geologist's files, Kirkland Lake	"
Hecmac (Pepin)	Grenfell	Resident Geologist's files, Kirkland Lake	"
Hersey	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21	"
Hilltop	Catharine	O.D.M. Vol. XXXVIII, 1929, pt. 6, pp. 103-105	"
Hill	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 46	"

Miscellaneous—Gold Properties (continued)

Property	Townships	References	Metal
Highridge (Wesley)	McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 93 Resident Geologist's files, Kirkland Lake	Gold
Honer (Kirkland-Kalgoorlie)	Teck	O.D.M. Vol. XXIX, 1920, pt. 4, p. 45	"
Hoshko	McElroy	Resident Geologist's files, Kirkland Lake	"
Hughes	Pacaud	O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 96	"
Hughes-McElroy	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 47	"
Hurd	Hearst	Resident Geologist's files, Kirkland Lake	"
Hurd	Teck	Resident Geologist's files, Kirkland Lake	"
Imerson (Kitchener-Kirkland)	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 20	"
Irish	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 47	"
Ivanhoe-Boston	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 33	"
Ivan Larder	McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 64 Resident Geologist's files, Kirkland Lake	"
Jackson	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
James Kirkland (Scott-Kirkland)	Teck	Resident Geologist's files, Kirkland Lake	"
Jenner	McGarry	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 24	"
Jimgo (Judge)	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 47	"
Johnson	Pacaud	O.D.M. Vol. LXVI, 1957, pt. 5, p. 47	"
Johnson	Eby	Resident Geologist's files, Kirkland Lake	"
Johnson	McElroy	Resident Geologist's files, Kirkland Lake	"
Johnson (Coniagas)	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, pp. 21, 22	"
Jompetie (Jean Petit?)	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 2	"
Jordon	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Joy	McVittie	Resident Geologist's files, Kirkland Lake	"
Judge (Jimgo)	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 47	"
Kaplan (Solomino)	Gauthier; McVittie	Resident Geologist's files, Kirkland Lake	"
Kari-Altonen	McVittie	Resident Geologist's files, Kirkland Lake	"
Kelkirk	Gauthier; McElroy	Resident Geologist's files, Kirkland Lake	"
Kelly-Kirkland	Teck	Resident Geologist's files, Kirkland Lake	"
Kelsina Kirkland	Gauthier	Resident Geologist's files, Kirkland Lake	"
Kenakott-Kirkland (Seneca Lebel)	Lebel	Resident Geologist's files, Kirkland Lake	"
Kennedy-Short	Boston	Resident Geologist's files, Kirkland Lake	"
Kent Lake (North Rand)	Gauthier	Resident Geologist's files, Kirkland Lake	"
Kenzie (R.A.P. Syn.)	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 33, 34	"
Kerrigan	McGarry	Resident Geologist's files, Kirkland Lake	"
Kerromac	McGarry	Resident Geologist's files, Kirkland Lake	"
Kidihawk	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 48 Resident Geologist's files, Kirkland Lake	"
Killoran	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Kirduke	Lebel	Canadian Mines Handbook, 1939, p. 142 O.D.M. Map No. 53a	"
Kirk Cobalt (Quinte)	Teck; Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94 (<i>see also</i> Dane Copper)	"
Kirkland Central (Oke)	Lebel; Morrisette	Canadian Mines Handbook, 1946, p. 167 O.D.M. Map No. 53a	"
Kirkland Commodore	Lebel	Resident Geologist's files, Kirkland Lake	"
Kirkland Consolidated (Blaugrund)	Gauthier	Resident Geologist's files, Kirkland Lake	"
Kirkland Consolidated (Republic Tungsten)	Grenfell	Resident Geologist's files, Kirkland Lake	"
Kirkland Eastern	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Kirkland Goldfields (Ross-Powell)	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Kirkland Larder (Wadassa, Fork Lake)	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 19 Resident Geologist's files, Kirkland Lake	"
Kirkland Syndicate	McVittie	Resident Geologist's files, Kirkland Lake	"
Kir-Vit (Grainger-Yuill)	McVittie	O.D.M. Vol. L, 1941, pt. 7, pp. 75, 76	"
Kiryan Gold (Kirkland Consolidated)	Grenfell	Resident Geologist, Kirkland Lake	"
Kitchener-Kirkland	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Kitchener-Kirkland (Imerson)	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 20	"
Knutson Mining Corp.	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, pp. 24, 25 Resident Geologist's files, Kirkland Lake	"
Kohinoor	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 76	"
Kokotow	Gauthier	Resident Geologist's files, Kirkland Lake	"
Kordol (Gold Bank, Gold Ridge)	Catharine	Resident Geologist's files, Kirkland Lake	"
Korola-Larder	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 25	"
Kuzik	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 38	"
La Fond (Grace Lake)	Skead	O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 111 Resident Geologist's files, Kirkland Lake	"
LaGace (Hecmac Syn.)	Grenfell	Resident Geologist's files, Kirkland Lake	"
Lamond	Boston	O.D.M. Vol. LIX, 1950, pt. 6, pp. 58, 59	"
Lar-Add	McVittie; McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 80 Resident Geologist's files, Kirkland Lake	"
Larbase Mining Syndicate	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30	"

Miscellaneous—Gold Properties (continued)

Property	Townships	References	Metal
Lardego (Legardo)	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 80	Gold
Larderknife (Largold)	McGarry	Canadian Mines Handbook, 1946, p. 176	"
Larder Combined	Hearst	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 25	"
Larder Townsite	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 89	"
Larder "U" Island Mine	McGarry	Resident Geologist's files, Kirkland Lake	"
Lardon	Gauthier	Resident Geologist's files, Kirkland Lake	"
Largold	McGarry	Canadian Mines Handbook, 1946, p. 177	"
Larmont (Thib)	McVittie; Hearst	O.D.M. Vol. L, 1941, pt. 7, p. 92	"
Lebel-Crystal Lake (Kirkland Commodore)	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94 Resident Geologist's files, Kirkland Lake	"
LeBeouf	Hearst	Resident Geologist's files, Kirkland Lake	"
Legardo (Lardego)	McVittie	O.D.M. Vol. L, 1941, pt. 7, pp. 80, 81	"
Lemieux Lake	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 89	"
Lipasti	McFadden	Resident Geologist's files, Kirkland Lake	"
Little Long Lac (Todora)	Eby; Otto	Resident Geologist's files, Kirkland Lake	"
Lois Lake (Tresdor Larder)	Teck	Resident Geologist's files, Kirkland Lake	"
Lowe	Grenfell	Resident Geologist's files, Kirkland Lake	"
Lowe	Hearst	Resident Geologist's files, Kirkland Lake	"
Lower Canada	Gauthier; McElroy	O.D.M. Vol. L, 1941, pt. 8, p. 19 Resident Geologist's files, Kirkland Lake	"
Lucky Girl	Hearst; McFadden	O.D.M. Vol. LVI, 1947, pt. 8, p. 6 Resident Geologist's files, Kirkland Lake	"
Lumsden	Eby	Resident Geologist's files, Kirkland Lake	"
McCallum	McGarry	Resident Geologist's files, Kirkland Lake	"
McCrae	Boston	Resident Geologist's files, Kirkland Lake	"
McDonagh	McVittie	Resident Geologist's files, Kirkland Lake	"
McDonald	Hearst	Resident Geologist's files, Kirkland Lake	"
McDonald	Boston	Resident Geologist's files, Kirkland Lake	"
McGarry Gold Mines Syndicate	McVittie; McGarry	Resident Geologist's files, Kirkland Lake	"
McGinley-Teck	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
McInnis	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21 Resident Geologist's files, Kirkland Lake	"
McIntosh	McVittie	O.D.M. Map No. 50b	"
MacKay	McVittie	Resident Geologist's files, Kirkland Lake	"
McKinnon (Casteck)	Teck	Resident Geologist's files, Kirkland Lake	"
McLaren	Hearst	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 25	"
McMillan-Boylan	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30	"
McMillan, M.	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 50	"
McMillan, William	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 50	"
McNeil	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 31	"
McPhail	McVittie	Resident Geologist's files, Kirkland Lake	"
McRae (Knutson M. Corp.)	Hearst	Resident Geologist's files, Kirkland Lake	"
McVittie Kirkland	McVittie; McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 81	"
Magni Mining (Scott-Kirkland)	Teck; Grenfell	Resident Geologist's files, Kirkland Lake	"
Malone Lake Gold	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21	"
Mandrow	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 39	"
Manor Gold	Skead	O.D.M. Vol. LVIII, 1949, pt. 6, pp. 34, 35	"
Many Metals	Hearst	Resident Geologist's files, Kirkland Lake	"
Marsh	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 50	"
Marshall, Charles	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 39, 40	"
Martin	Gauthier	O.D.M. Map No. 50c	"
Martin	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30	"
Mayer Mining	Teck	Resident Geologist's files, Kirkland Lake	"
Mayfair	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 51	"
Merrell	Teck	Resident Geologist's files, Kirkland Lake	"
Meurer	Gauthier	Resident Geologist's files, Kirkland Lake	"
Mid-Kirk	Lebel	Resident Geologist's files, Kirkland Lake	"
Mid-North Engineering (Walsh-Katrine)	Katrine; Ossian	Resident Geologist's files, Kirkland Lake	"
Miller-Alex	Teck	Resident Geologist's files, Kirkland Lake	"
Miller-Midlothian	Gauthier	O.D.M. Vol. XXXII, 1923, pt. 4, p. 82	"
Miller-Imerson	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Miller-Independence	Pacaud	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 48, 49 Resident Geologist's files, Kirkland Lake	"
Milton (Pancake Lake Syn.)	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 20	"
Mitchell-Hearst	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, pp. 27, 28 Resident Geologist's files, Kirkland Lake	"
Monargo	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Mondoux	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, pp. 51, 52	"
Montario	Boston	Resident Geologist's files, Kirkland Lake	"

Miscellaneous—Gold Properties (continued)

Property	Townships	References	Metal
Moore	McGarry	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 23	Gold
Moosewood	McVittie	O.D.M. Vol. L, 1941, pt. 7, pp. 81, 82 Resident Geologist's files, Kirkland Lake	"
Morgan (Stewart)	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Morrisette, G. M., Ltd.	Morrisette	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Mulligan	Otto	Resident Geologist's files, Kirkland Lake	"
Mundy	Eby	Resident Geologist's files, Kirkland Lake	"
Myles	Lebel	O.D.M. Vol. XXXII, 1923, pt. 4, p. 70	"
New Belorrain (Avalard)	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 15	"
Newman	Grenfell	Resident Geologist's files, Kirkland Lake	"
Niagara Kirkland	Gauthier	O.D.M. Map No. 50c	"
Nipiron	Teck	Resident Geologist's files, Kirkland Lake	"
Norart	Gauthier	Resident Geologist's files, Kirkland Lake	"
Northeast Kirkland	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
North Rand (Kent Lake)	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 19	"
North Shore Syndicate	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
O'Donald	Boston; Pacaud	Resident Geologist's files, Kirkland Lake	"
Oke (Kirkland Central)	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Olivet	Gauthier; McVittie; McElroy	O.D.M. Vol. L, 1941, pt. 8, p. 20 Resident Geologist's files, Kirkland Lake	"
Pancake Lake Syn. (Milton)	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 20	"
Pelangio-Larder	McGarry	O.D.M. Vol. L, 1941, pt. 7, pp. 88, 89	"
Penn Kirkland	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Pepin (Hecmac, Legace)	Grenfell	Resident Geologist's files, Kirkland Lake	"
Perry-Kirkland	Gauthier	O.D.M. Map. No. 50c Canadian Mines Handbook, 1962, p. 201	"
Peterson	Lebel	Resident Geologist's files, Kirkland Lake	"
Petrin-Mortson	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 28	"
Pollock	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 53	"
Pollock	Lebel	O.D.M. Map No. 53a	"
Potter	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 53	"
Preston E. Dome	Eby	Resident Geologist's files, Kirkland Lake	"
Pritchard Kirkland	Lebel	Canadian Mines Handbook 1937, p. 359 O.D.M. Map No. 53a	"
Proprietary	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30	"
Quennada	McVittie	Resident Geologist's files, Kirkland Lake	"
Quinn-Hearst	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30	"
Quinte (Kirk-Cobalt)	Teck; Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Radley	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 41	"
R.A.P. Syndicate	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 33, 34	"
Ribar	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, pp. 53, 54	"
Richardson	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21	"
Richie	McGarry	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 24	"
Ritchie-Moore	Lebel	O.D.M. Map No. 53a	"
Rocamsa	Lebel	Resident Geologist's files, Kirkland Lake	"
Roche Long Lac	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30	"
Roche Syn. (Evenode)	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Roche-Wile Kirkland Lake Syn.	Teck	Canadian Mines Handbook, 1937, p. 229	"
Ronal Red Lake (Tough)	Morrisette; Arnold	Resident Geologist's files, Kirkland Lake	"
Rose	Lebel	O.D.M. Map No. 53a	"
Rose Gold	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 90 Resident Geologist's files, Kirkland Lake	"
Rosen (Avalard)	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 15 Resident Geologist's files, Kirkland Lake	"
Ross-Powell Syn. (Kirkland Goldfields)	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94 O.D.M. Map No. 53a	"
Ross Wall	McVittie	O.D.M. Map No. 50b	"
Rouyn Reward (Alpha Larder)	McVittie	O.D.M. Map No. 50b Canadian Mines Handbook, 1944, p. 203	"
Roy	McGarry	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 24	"
St. Jean	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 54	"
St. Joseph Kirkland	Teck	O.D.M. Map No. 1945-1 Resident Geologist's files, Kirkland Lake	"
St. Joseph Kirkland	Lebel	O.D.M. Map. No. 53a	"
Sanderson	Teck; Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, face p. 94	"
Saratoga Exploration	Hearst	Resident Geologist's files, Kirkland Lake	"
Scott-Chibougamau (Gauthier)	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 19 Resident Geologist's files, Kirkland Lake	"
Scott-Kirkland Magni Mining	Teck	Resident Geologist's files, Kirkland Lake	"
Searchlight Larder Lake (Combined Larder)	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 24	"

Miscellaneous—Gold Properties (continued)

Property	Townships	References	Metal
Seneca Lebel (Kennakott Kirkland)...	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	Gold
Servais, G. M., Ltd.	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Shafer	McGarry	Resident Geologist's files, Kirkland Lake	"
Sheldon Larder	McGarry	O.D.M. Vol. L, 1941, pt. 7, pp. 90-92	"
Shepherd	McVittie	Resident Geologist's files, Kirkland Lake	"
Shunshby	Boston	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21	"
		O.D.M. Vol. LXVI, 1957, pt. 5, pp. 42, 43	"
		Resident Geologist's files, Kirkland Lake	"
Simpson	Lebel	Resident Geologist's files, Kirkland Lake	"
Skinner	Lebel	O.D.M. Map No. 53a	"
Solomino (Kaplan)	Gauthier; McVittie	Resident Geologist's files, Kirkland Lake	"
South Kirkland	Hearst	Resident Geologist's files, Kirkland Lake	"
Spectacle Larder Lake	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 92	"
Standard Kirkland	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Stelmack	Lebel	O.D.M. Map No. 53a	"
Stevens-Baird (New Kelore)	Grenfell	Resident Geologist's files, Kirkland Lake	"
Stevenson (Casteck)	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
		Resident Geologist's files, Kirkland Lake	"
Stewart, W. T.	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 43	"
		Resident Geologist's files, Kirkland Lake	"
Stewart (Morgan)	Gauthier	O.D.M. Map No. 50c	"
Stitt (Grenfell-Kirkland)	Grenfell	Resident Geologist's files, Kirkland Lake	"
Stobie Flood (Biroco)	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Sylvanite	Eby	Resident Geologist's files, Kirkland Lake	"
Tagliamonte (Gold Leaf)	Boston	O.D.M. Vol. LIX, 1950, pt. 6, pp. 62, 63	"
Teck Centre Syndicate	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Teck Kirkland	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Tenendo Mining Corp.	McVittie	Resident Geologist's files, Kirkland Lake	"
Thib Gold (Larmont)	McVittie; Hearst	O.D.M. Vol. L, 1941, pt. 7, pp. 92, 93	"
		Resident Geologist's files, Kirkland Lake	"
Thompson	Gauthier	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Tobico	Gauthier	O.D.M. Vol. L, 1941, pt. 7, pp. 22, 23	"
		Resident Geologist's files, Kirkland Lake	"
Todora	Eby; Otto	Resident Geologist's files, Kirkland Lake	"
Toronto Kirkland (Glenora)	Lebel	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Tough & Associates	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 30	"
Tough	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, pp. 54, 55	"
Tough (Ronald Red Lake)	Morrisette; Arnold	Resident Geologist's files, Kirkland Lake	"
Tovarich-Larder	McElroy; Hearst	O.D.M. Vol. LIX, 1950, pt. 6, p. 55	"
Tremblay	Grenfell	Resident Geologist's files, Kirkland Lake	"
Tresdor Larder (Lois Lake)	Teck	Resident Geologist's files, Kirkland Lake	"
Tresdor Larder	McGarry; Ossian	Resident Geologist's files, Kirkland Lake	"
Tully	Lebel	Resident Geologist's files, Kirkland Lake	"
Turzone (Hilltop)	Catharine	Resident Geologist's files, Kirkland Lake	"
Tyon Gold	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 29	"
Upper Canada	Lebel	Resident Geologist's files, Kirkland Lake	"
Urquhart-Costello	McGarry	O.D.M. Vol. XXXIII, 1924, pt. 3, pp. 22, 23	"
Utah Larder	McElroy; Gauthier	O.D.M. Vol. LIX, 1950, pt. 6, p. 55	"
		Resident Geologist's files, Kirkland Lake	"
Val Burda (Kidihawk)	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 48	"
		Resident Geologist's files, Kirkland Lake	"
Velvet Larder	Hearst	O.D.M. Vol. LXI, 1947, pt. 8, p. 30	"
Ventures (Kohinoor)	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 76	"
Vindicator	Teck	O.D.M. Map No. 1945-1	"
Virgo-Larder	Hearst	O.D.M. Vol. LVI, 1947, pt. 8, p. 29	"
Wadasa (Kirkland Larder)	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 19	"
		Resident Geologist's files, Kirkland Lake	"
Wadge (Walsh-Katrine)	Katrine; Ossian	Resident Geologist's files, Kirkland Lake	"
Walker	McGarry	Resident Geologist's files, Kirkland Lake	"
Walsh-Katrine (Wadge)	Katrine; Ossian	Resident Geologist's files, Kirkland Lake	"
Walsh Syndicate (Fork Lake)	Gauthier	O.D.M. Vol. L, 1941, pt. 8, p. 19	"
Watkins	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 43	"
Watling Larder (Hearst Larder N.)	Hearst	Resident Geologist's files, Kirkland Lake	"
Weatherhead	Pacaud	O.D.M. Vol. LXVI, 1957, pt. 5, p. 52	"
Wedderburn (Kirkland Commodore)	Lebel	Resident Geologist's files, Kirkland Lake	"
Weland-Kirkland	Lebel	O.D.M. Map No. 53a	"
Wesley (Highridge)	McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 93	"
Wessel	Teck	O.D.M. Vol. XXXVII, 1928, pt. 2, <i>face</i> p. 94	"
Westwind Exploration	Teck	Resident Geologist's files, Kirkland Lake	"
Wilson	Lebel	O.D.M. Map No. 53a	"
Wiltsey	McVittie	O.D.M. Vol. XXXIII, 1924, pt. 3, p. 21	"

Miscellaneous—Gold Properties (continued)

Property	Townships	References	Metal
Winchester Larder (Hayes Cadillac) . . .	McVittie; McGarry.	O.D.M. Vol. L, 1941, pt. 7, pp. 93, 94 Resident Geologist's files, Kirkland Lake	Gold
Wojcieszyn	McFadden	Resident Geologist's files, Kirkland Lake	"
Wojcieszyn	Gauthier	Resident Geologist's files, Kirkland Lake	"
Wright-Carrol	Lebel	Resident Geologist's files, Kirkland Lake	"
Wright-Hargreaves (Little Long Lac) . . .	Eby; Otto	Resident Geologist's files, Kirkland Lake	"
Yield (Spectacle-Larder Lake)	McVittie	O.D.M. Vol. L, 1941, pt. 7, p. 92	"
Yost (Utah Larder)	McElroy; Gauthier .	O.D.M. Vol. LIX, 1950, pt. 6, p. 55 Resident Geologist's files, Kirkland Lake	"
Youmans	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 56	"

Nonferrous Base Metals (Copper, Nickel, Lead, and Zinc)

AMITY COPPER GOLD MINES LTD.

- Location** This is the former Johnson property and is the south half of Lot 5, concession VI, Pacaud township.
- Chief Metal Present** Copper.
- History and Development** Amity Copper Gold Mines Ltd. was formed in 1926 to develop the Johnson property, and shaft-sinking was started. The company was incorporated in 1927. By the time the mine closed early in 1930, underground development consisted of a shaft to a depth of 1,020 feet, with lateral work on the 50-, 125-, 250-, 475-, 600-, and 1,000-foot levels. The mine was reopened for 3 months in 1933. In 1934 the company was reorganized under the name of Amity Gold Mines Ltd. The charter of this company reverted to the Crown in 1944. In 1951 the property, which had been acquired by Marge Copper Gold Mines Ltd., was optioned to Golden Arrow Mines Ltd. (later Consolidated Golden Arrow Mines Ltd.). The mine was dewatered to below the 250-foot level, resampled, and once more was allowed to flood. Marge Copper Gold Mines leased the property to Mirla Exploration in 1955; Mirla produced some ore from the 250-foot level until the end of the year.
- Geology** The country rock is predominantly Keewatin tuff or tuffaceous sediments that have been intruded by a large batholith of Algoman granite. A narrow horizon of acid and cherty tuff is interbedded with the main band of Keewatin tuffs. It strikes northwesterly, parallel to the granite batholith, at a distance of 100–200 feet northeast of the contact.
- The Amity shaft was sunk on a quartz vein 2 feet wide in a crossfault that strikes normal to the granite contact and intersects iron formation lying along the southwest contact of the acid-tuff member. On each side of the quartz vein, short lenses of chalcopyrite occur as replacements in the iron formation. Associated with the chalcopyrite are varying amounts of magnetite, pyrite, sphalerite, and galena. The same geological formations are present in the Patterson and Tretheway-Ossian mines southeast.
- Production** "During the period 1927-30, 13 cars of ore of 4–13 percent copper are reported to have been shipped to the Noranda smelter" (S. A. Pain). In 1933, shipment from the property is reported to have been 177 tons of copper ore. The 1955 production amounted to 863 tons of copper ore.
- References** O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 101.
O.D.M. Vol. XLIII, 1934, pt. 1, p. 59.
O.D.M. Vol. LXV, 1956, pt. 2, p. 5.
O.D.M. Vol. LXVI, 1957, pt. 2, p. 6.
O.D.M. Vol. LXVI, 1957, pt. 5, pp. 43, 44.
Report by S. A. Pain (1942) in O.D.M. Resident Geologist's files, Kirkland Lake.

DANE COPPER PROPERTY

Location	The claim group is in Lebel and Teck townships. It consists of claims L.51700, L.16709, L.54022, L.54023, and L.54024 in Teck; and L.52929 and L.52930 in Lebel.
Chief Metal Present	Copper.
History and Development	Originally known as the Ogilvie-McKinnon Copper Mine. In 1912 the Dane Mining Co. sank 2 shafts, to a depth of 100 and 113 feet respectively, on claim L.52929 in Lebel township. At a later date the east shaft (113 feet) was deepened to 200 feet, and 200 feet of lateral work was done.
Geology	<p>The claims form an east-west linear group in an area of Keewatin rocks wedged between 2 masses of syenite. The contact with the easterly and larger mass runs north-south through the east claim of the group adjoining claim L.52929. Much of the so-called Keewatin rock, altered locally to hornblende schist, is of sedimentary origin. Two separate quartzite bands of the iron-formation type pass through the east and west shafts respectively in claim L.52929. They have a strike slightly west of north with a steep dip to the east.</p> <p>The principal showings consist of 2 copper-bearing veins of different character. The east shaft was sunk on the important vein that is a chloritic zone in thinly bedded quartzite heavily mineralized with chalcopyrite. A chipped sample across 3 feet ran 9.72 percent copper with no gold values.</p> <p>The second vein is a vertical quartz vein striking east-west across the local rock structure; chalcopyrite occurs in the form of spots in the quartz. A 5-foot chip sample across the vein to the east of the shaft assayed 2.13 percent copper. (William Gerrie 1953)</p>
Production	Small shipments of copper ore were made 1911-13. Statistics regarding the tonnage shipped are conflicting.
References	Report by William Gerrie in O.D.M. Resident Geologist's files, Kirkland Lake. O.D.M. map No. 53a, 1944.
Remarks	Diamond-drilling and geophysical survey in 1951-52; property acquired by Consular Harker Mines Ltd. in 1953. Under option to Iso Uranium Mines Ltd. in 1956; east shaft dewatered and sampled; additional diamond-drilling.

HEARST-LARDER MINES LTD. (South Group)

Location	Hearst and McElroy townships; claims L.57564, L.57565, L.57566, L.57567, L.57568, L.57569, L.57570, L.57571, L.57572, L.57577, L.57578. (1951)
Chief Metals Present	Copper, lead, and zinc.
History and Development	Early prospecting work is indicated by a few old pits and trenches. The discovery of a new sulphide showing in 1951 led to the staking of the claims for Hearst-Larder Mines Ltd. Diamond-drilling in 1952 followed a geophysical survey.
Geology	This is a small gossan zone with low ground to the north and east on claim L.57564 in McElroy township. Stringers and patches of chalcopyrite, galena, and sphalerite occur with earlier pyrite-pyrrhotite; the mineralization fills fractures of 2 ages in brittle quartzite. The first fracturing brought in the pyrite and pyrrhotite. The second fracturing was more restricted and resulted in a localized concentration of the other sulphides.

Sampling Results Chip samples gave assays ranging from 0.85 to 2.11 percent copper, 0.57–5.84 percent lead, and 0.30–1.92 percent zinc. (William Gerrie)

References O.D.M. Maps, No. 1947-1, and No. 1950-3.
Reports by William Gerrie (1952) in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks Eight holes were drilled in 1952; no sulphide intersections of economic grade in the core. Gold occurs on the company's north claim group in Hearst township.

PATTERSON COPPER MINES LTD.

Location The property consists of the south half of Lot 4, concession VI, Pacaud township. It adjoins the Amity property.

Chief Metal Present Copper.

History and Development Patterson Copper Mines Ltd. was incorporated in 1927. Shaft-sinking started in 1928. By the time the mine closed in October 1929, the shaft had reached a depth of 520 feet, with lateral work on the 125-, 250-, 375-, and 500-foot levels. The property was purchased by Barry-Hollinger Gold Mines Ltd. in 1933. Marge Copper Gold Mines Ltd. acquired the property in the late 1940s and optioned it to Golden Arrow Mines Ltd. (later Consolidated Golden Arrow Mines Ltd.) in 1951. The property was optioned again by Marge Copper to Mirla Exploration in 1955; Mirla produced some ore from the mine before operations were suspended in November 1956.

Geology The country rock is predominantly Keewatin tuff or tuffaceous sediments that have been intruded by a large batholith of Algonian granite. A narrow horizon of acid and cherty tuff is interbedded with the main band of Keewatin tuffs. It strikes northwesterly, parallel to the rim of the granite batholith, at a distance of 100–200 feet northeast of the contact.

The Patterson shaft was sunk a short distance northeast of the above-mentioned acid-tuff member that extends across the property from the adjoining Amity claim. The copper ore occurs in a narrow horizon of iron formation as small replacement bodies on each side of several small quartz-filled cross faults. The iron formation lies along the northeast contact of the band of acid tuff. The orebodies in the adjoining Amity and Tretheway properties occur under the same conditions.

The mineralization is chiefly chalcopyrite with varying amounts of magnetite, pyrite, pyrrhotite, and other sulphides.

Production During the 1928–29 operations, it is reported that 9 cars of sorted ore were shipped to Noranda, and that the average content per ton was 8 percent copper, and ½ ounce of silver. (S. A. Pain)

Mirla Exploration shipped 3,279 tons of copper ore to Noranda in 1956.

References O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 102.
O.D.M. Vol. XXXIX, 1930, pt. 1, p. 78.
O.D.M. Vol. LXVI, 1957, pt. 2, p. 6.
O.D.M. Vol. LXVI, 1957, pt. 5, pp. 49, 50.
Canadian Mines Handbook, 1937, p. 355.
Report by S. A. Pain (1942) in O.D.M. Resident Geologist's files, Kirkland Lake.

Remarks The property was acquired by Fidelity Mining Investments in 1961.

TRETHERWAY-OSSIAN MINES LTD.

- Location** The property consists of the N. $\frac{1}{2}$ of lot 3, concession V, Pacaud township. Its northwest corner adjoins the Patterson property.
- Chief Metal Present** Copper.
- History and Development** Tretheway-Ossian Mines Ltd. was incorporated in 1925. A shaft was sunk to a depth of 120 feet in 1929 in a quartz vein that cuts across the same zone of copper mineralization that was mined in the Patterson and Amity mines northwest. Before operations ceased in 1930, some lateral work had been done on the 125-foot level.
- The property reverted to the Crown and was restaked by C. Cameron in 1947 and leased to R. C. Coutts in 1948. It was optioned to Golden Arrow Mines Ltd. (later Consolidated Golden Arrow Mines Ltd.) in 1951. This company drilled below the old mine from surface and deepened the shaft to 220 feet. A crosscut was driven southwestward on the 200-foot level to reach a second zone of copper mineralization indicated by diamond-drilling. The option was dropped in 1954, and Cameron formed his own company, Cam Copper Mines Ltd. Several shipments of hand-picked ore were made to Noranda before fire destroyed the surface plant early in 1955. The property was leased to Mirla Exploration in 1956; it was acquired by Alfco Mines Ltd. in 1959, and by Fidelity Mining Investments in 1961. Fidelity shipped about 1,000 tons of ore (all the known reserves) to Noranda in 1962.
- Geology** The country rock is predominantly Keewatin tuff or tuffaceous sediments that have been intruded by a large batholith of Algoman granite. A narrow horizon of acid and cherty tuff is interbedded with the main band of Keewatin tuffs. It strikes northwesterly parallel to the granite batholith, at a distance of 100–200 feet northeast of the contact.
- As on the Amity and Patterson properties, the copper ore occurs as replacement bodies of chalcopyrite in narrow bands of iron formation adjacent to a quartz-filled crossfault. The iron formation bands occur along the contacts of the acid tuff member with the more basic tuff.
- Production** No shipment of ore was made from the property in 1929–30. R. C. Coutts shipped 22 tons of hand-picked ore from the dump to the Noranda Smelter in 1948.
- In 1955, Cam Copper Mines Ltd. produced 43,411 pounds of copper valued at \$16,008.
- Fidelity Mining Investments, as noted above, shipped about 1,000 tons of high-grade copper in 1962 to Noranda Mines for processing.
- References** O.D.M. Vol. XXXVIII, 1929, pt. 6, p. 102.
O.D.M. Vol. LXV, 1956, pt. 2, p. 2.
O.D.M. Vol. LXVI, 1957, pt. 5, pp. 51, 52.
Canadian Mines Handbook 1962, p. 93.
- Reports by S. A. Pain (1942), R. G. Hoiles (1952), and G. F. Ennis (1960), and diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.

WINNIE LAKE PROPERTY

- Location** The nucleus of the property consisted of 9 patented claims in the northwest corner of Teck township; these were staked about 1910. The claim numbers were: L.1898, L.1899, L.2695, L.2696, L.2697, L.2698, L.2699, L.2700, L.2701.
- Chief Metal Present** Copper, and zinc.
- History and Development** The property, first known as Leguee-Tobicoe copper claims, was transferred to S. Ogilvie and Alex. McKinnon in 1912. A shaft was sunk to a depth of 27 feet in the mineralized zone on claim L.1899 and a small shipment of copper-zinc ore was made at that time. In 1927 the property was optioned to the Ottawa-Teck Syndicate. Later in the same year an electrical survey was made by Hans Lundberg; several weak anomalies were indicated. The Winnie Lake Mining Co. Ltd., incorporated in 1929, acquired a group of 14 claims consisting of the original mine plus 5 additional contiguous claims. In 1938 the property was optioned by Erie Canadian Mines Ltd. and 4 short diamond-drillholes were put down along the main sulphide zone. Two additional holes were put down by the Winnie Lake Mining Co. to test the ground east of the shaft. Only a few scattered patches of copper-zinc mineralization were found in the drill cores. The property was taken over by Prosperity Mineral Mining Syndicate in the 1940s and was optioned to Macassa Mines Ltd. in 1950. Macassa put down 5 diamond-drillholes, but no sulphides of commercial importance were encountered.
- Geology** The main sulphide showing is in the southwest corner of claim L.1899, which borders on the southeast shore of Winnie Lake. The sulphides occur close to the south contact of a shallow roof pendant of siliceous lava overlying a granite-syenite intrusive. The sulphide zone strikes in an east-west direction; it is exposed over a length of about 70 feet near the shaft but is only a few feet in width. The rock on the dump shows some heavy sulphide mineralization of pyrrhotite, pyrite, chalcopyrite, sphalerite, and traces of galena. Small lenses of magnetite occur with the sulphides.
- Sampling Results** Analysis of selected grab samples of sulphide material from the dump at the shaft have indicated a considerable content of copper and zinc with gold values as high as \$2.10 per ton. The best drill intersection obtained was in the Erie Canadian hole No. 2. This indicated 4.2 percent copper in 2.7 feet of core. The first of the 2 holes drilled by Winnie Lake Mining Co. about 450 feet east of the shaft, cut a 5-foot width that assayed 0.01 ounces of gold per ton, 1.03 percent copper, and 0.24 percent zinc. The Macassa drilling produced one intersection below the main sulphide showing. This intersection averaged 1.16 percent copper over 9 feet. (O.D.M. Resident Geologist's files, Kirkland Lake)
- References** O.D.M. Vol. XXXVII, 1928, pt. 3, pp. 43, 44.
O.D.M. Vol. LVII, 1948, pt. 5, p. 53.
Reports and diamond-drilling information in O.D.M. Resident Geologist's files, Kirkland Lake.
- Remarks** Most of the patented claims, including L.1899 containing the main showing and shaft, reverted to the Crown in 1954 and 1955. The property was held by Dominion Gulf in 1956. It has been restaked several times in recent years.

MISCELLANEOUS—NONFERROUS BASE-METAL PROPERTIES

Property	Townships	References	Metal
Anderson (Forward)	Katrine	Resident Geologist's files, Kirkland Lake	Copper
Bargnesi (Elsie Boston Lake)	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 31, 32. Resident Geologist's files, Kirkland Lake	Copper
Big Jackpot (Scarth)	McElroy	Resident Geologist's files, Kirkland Lake	Copper
Campbell-Jeanjacquet	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 32, 33. Resident Geologist's files, Kirkland Lake	Copper, lead zinc
Campbell, D.	Catharine	O.D.M. prel. map No. p. 142.	Copper, gold
Claim M.R. 25 (Hudson Bay)	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 52.	Lead, zinc
Cowan	McElroy	Resident Geologist's files, Kirkland Lake	Copper
Elsie Boston Lake (Bargnesi)	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 31, 32.	Copper
Forward Mining Syn. (Anderson)	Katrine	Resident Geologist's files, Kirkland Lake	Copper
Hilltop	Catharine	O.D.M. Vol. XXXVIII, 1929, pt. 6, pp. 103, 104 O.D.M. prel. map No. p. 142	Copper, gold
Hudson Bay (Claim M.R. 25)	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 52.	Lead, zinc
Jean Petit (Jompétie?)	McElroy	O.B.M. Vol. XXV, 1916, pt. 1, p. 252.	Copper, gold
Kennedy-Boston	Catharine	O.D.M. Vol. XXX, 1921, pt. 6, pp. 18, 19. O.D.M. prel. map No. 142	Copper, gold
Knox, Wm.	Boston; McElroy	Resident Geologist's files, Kirkland Lake	Copper
Lake Beaverhouse (Argonaut)	Gauthier	Resident Geologist's files, Kirkland Lake O.D.M. Vol. L, 1941, pt. 8, pp. 16, 18.	Copper, gold
Little Long Lac (Todora)	Eby; Otto	Resident Geologist's files, Kirkland Lake	Copper, gold
Lowe-Little	McElroy	Resident Geologist's files, Kirkland Lake	Copper
Lowe, D. (Vitro-Minerals)	McElroy; Hearst	Resident Geologist's files, Kirkland Lake	Lead, zinc
Lowe, D. (Wright-Hargreaves)	McElroy	Resident Geologist's files, Kirkland Lake	Copper, lead, nickel
Lowe-Cowan (Wright-Hargreaves)	McElroy	Resident Geologist's files, Kirkland Lake	Copper
Mallard Lake (St. Pierre)	Morrisette	Resident Geologist's files, Kirkland Lake	Lead, silver
Marshall-Evoy	Boston	O.D.M. Vol. LXVI, 1957, pt. 5, p. 38. Resident Geologist's files, Kirkland Lake	Lead, zinc
Mary Ann	Gauthier	Resident Geologist's files, Kirkland Lake	Copper
Mathias (Kerr-Addison)	Ratray	Resident Geologist's files, Kirkland Lake	Copper
Mining Geophysics	McElroy	Resident Geologist's files, Kirkland Lake	Copper
Misema Lake Mining Corp.	Katrine	Resident Geologist's files, Kirkland Lake	Copper
Mondoux	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, pp. 51, 52.	Copper, lead, bismuth, zinc
McRae (Siscoe)	Hearst	Resident Geologist's files, Kirkland Lake	Copper
New Kelore	Grenfell	Resident Geologist's files, Kirkland Lake	Copper, lead
NW ¼ of S½, Lot 9, Con. VI	Pacaud	O.D.M. Vol. LXVI, 1957, pt. 5, p. 49.	Copper
Rochon (Rose)	McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 89.	Copper
Rose (Rochon)	McGarry	O.D.M. Vol. L, 1941, pt. 7, p. 89.	Copper
Round Lake Copper (Sheroomac)	Pacaud	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 41, 42. Resident Geologist's files, Kirkland Lake	Copper
St. Jean	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 54. Resident Geologist's files, Kirkland Lake	Lead, gold
St. Pierre (Mallard Lake)	Morrisette	Resident Geologist's files, Kirkland Lake	Lead, silver
Scarth	McElroy	O.D.M. Vol. LIX, 1950, pt. 6, p. 54.	Lead, zinc
Sheroomac (Round Lake Copper)	Pacaud; Boston	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 41, 42.	Copper
Siscoe Gold (McRae)	Hearst	Resident Geologist's files, Kirkland Lake	Copper
Sylvanite (Lowe-Little)	McElroy	Resident Geologist's files, Kirkland Lake	Copper
Tagliamonte	Pacaud	O.D.M. Vol. LXVI, 1957, pt. 5, p. 51.	Copper
Taroomac (Sheroomac)	Pacaud; Boston	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 41, 42.	Copper
Todora (Little Long Lac)	Eby; Otto	Resident Geologist's files, Kirkland Lake	Copper, gold
Tough, T. (Round Lake Copper)	Pacaud	O.D.M. Vol. LXVI, 1957, pt. 5, pp. 41, 42. Resident Geologist's files, Kirkland Lake	Copper
Tresdor Larder	McGarry; Ossian	Resident Geologist's files, Kirkland Lake	Copper, gold
Union Mining Co. (Rose)	McGarry	Resident Geologist's files, Kirkland Lake	Copper
Vitro Minerals (Lowe)	McElroy; Hearst	Resident Geologist's files, Kirkland Lake	Lead, zinc
Wright-Hargreaves (Lowe)	McElroy	Resident Geologist's files, Kirkland Lake	Copper, lead, nickel
Wright-Hargreaves (Lowe-Cowan)	McElroy	Resident Geologist's files, Kirkland Lake	Copper
Wright-Hargreaves	McElroy	Resident Geologist's files, Kirkland Lake	Copper
Wright-Hargreaves (Philibert)	McElroy	Resident Geologist's files, Kirkland Lake	Nickel

Iron

JONES AND LAUGHLIN STEEL CORPORATION LTD. (Adams Mine)

- Location** In the northeast quarter of Boston township.
- Chief Metal Present** Iron.
- History and Development** Iron deposits were discovered in Boston township in 1902, but the consequent exploration work showed the grade to be too low to be economic at that time. Iron, in the form of magnetite, occurs with silica in alternating layers in an iron formation of Keewatin age. Recent advancement in mining practices and in methods of concentration have made it possible to use low-grade deposits of this type as sources of iron ore.
- The Boston township iron range is about 7 miles southeast of the town of Kirkland Lake. It extends for nearly 6 miles across the northern part of the township in the form of a great arc but is not of economic interest throughout its entire length. The area of principal interest, outlined by a large aeromagnetic anomaly, lies between Milepost 5 on the Boston-Lebel boundary, and Marshall Lake lying about 3 miles southwest.
- In 1950 and 1951, Dominion Gulf Co. staked and optioned a group of 69 claims in the area of highest magnetic intensity. The optioned ground was subsequently purchased from Charles Marshall and other claim holders. Dominion Gulf did detailed geological mapping and magnetometer surveying, followed by channel sampling and 6,000 feet of diamond-drilling.
- In April 1954, Dominion Gulf Co. leased the claims to the Jones and Laughlin Steel Corporation. Additional diamond-drilling was done by Jalore Mining, the company's Canadian subsidiary, and beneficiation tests were made. The property was finally taken over from Dominion Gulf by Jalore Mining in 1956. Diamond-drilling at intervals since then has outlined the areas most suitable for open-pit operations.
- Geology** The iron formation is typical of that found in the Keewatin series of Precambrian rocks. It occurs intermittently over widths up to 4,000 feet, being interbedded with much tuff, agglomerate, and basic lava. Judging by the extent of these rocks, much volcanic activity accompanied the deposition of the iron formation. The alternating layers of black magnetite and white silica, usually highly-folded and contorted, give the iron formation a striking appearance. The average width of individual bands is about $\frac{1}{2}$ inch. Included within the iron formation is a considerable volume of so-called "lean iron formation", that is, banded siliceous rock containing only minor amounts of magnetite. The arc-shaped iron range roughly parallels the south contact of the Lebel syenite stock of Algomian age occupying most of the south half of Lebel township and extending for more than a mile into Boston township.
- Dimensions and Grade** Lenses of the iron formation grading not less than 24 percent iron may add up to as much as 150,000,000 tons (Northern Miner, 29 April 1954).
- References** O.D.M. Vol. XIV, 1905, pt. 1, pp. 261-268.
O.D.M. Vol. LXVI, 1957, pt. 5, pp. 26-29.

Remarks

Officials of Jones and Laughlin Steel Corporation announced on 1 February 1962 that construction of facilities for a \$30-million iron-ore mine in Boston township would be started in May. By the end of 1962 the stripping of the open pit areas and the construction work were well advanced. Production is planned for late 1964.

MISCELLANEOUS—IRON PROPERTIES

Property	Townships	References	Metal
Briscoe.....	Boston.....	Resident Geologist's files, Kirkland Lake....	Iron
Campbell, R. J.....	Boston.....	Resident Geologist's files, Kirkland Lake....	"
Dominion Gulf (Jones and Laughlin... Steel Corp.)	Boston.....	O.D.M. Vol. LXVI, 1957, pt. 5, p. 37.....	"
Evoy, N.....	Boston.....	Resident Geologist's files, Kirkland Lake O.D.M. Vol. LXVI, 1957, pt. 5, p. 35.....	"
Evoy and Collins.....	Boston.....	Resident Geologist's files, Kirkland Lake	"
Lots 3-6, con. III.....	Eby.....	Resident Geologist's files, Kirkland Lake.... Aeromagnetic map No. 289G, Dept. of Mines and Technical Surveys, Ottawa O.D.M. map No. 44b	"
Lunge, M.....	Boston.....	O.D.M. Vol. LXVI, 1957, pt. 5, p. 38.....	"
Marshall, Charles.....	Boston.....	Resident Geologist's files, Kirkland Lake O.D.M. Vol. LXVI, 1957, pt. 5, pp. 39, 40..	"
Ostrom, E. R.....	Boston.....	Resident Geologist's files, Kirkland Lake O.D.M. Vol. LXVI, 1957, pt. 5, p. 40.....	"
		Resident Geologist's files, Kirkland Lake	

Other Metallics

MOLYBDENUM, ETC.

Minor amounts of molybdenite, though making up only a fraction of 1 percent of the average ore, are widespread. It occurs chiefly as bluish-black coatings along slip planes in quartz or wallrocks or as thin films often showing slickensided surfaces.

Pyrite is by far the most abundant sulphide in the Kirkland Lake ores. It is usually present in exceptionally fine grains. Most of these occur either in the wallrocks adjacent to veins or in the many angular-to-rounded fragments of wallrock in the breccia type of ore. Most of the pyrite studied microscopically was found to contain abundant inclusions of minute particles of gangue, carbonates, gold, chalcopyrite, and lead telluride in the form of altaite.

Traces of arsenopyrite have been found at the Lake Shore mine, but it is exceptionally rare in the Kirkland Lake camp. At the Upper Canada mine northwest of Larder Lake, arsenopyrite is somewhat more abundant where it occurs as a replacement of pyrite, and traces of arsenopyrite have

been found in the lava-tuff type of ore at the Kerr-Addison Mine.

Spectrographic analyses of 4 samples from the Sylvanite, Teck-Hughes, Kirkland Lake Gold, and Macassa mines were consistent in showing traces of gold, silver, mercury, lead, tellurium, bismuth, manganese, cobalt, nickel, copper, titanium, vanadium, and chromium. The Macassa specimen gave a trace of antimony. The presence of many of these elements is undoubtedly due to admixed tellurides and gold.

A detailed description titled "Mineralogy of the Kirkland Lake Ores", by J. E. Hawley of Queen's University, was published in 1950 as Chapter 3 in Part 5 of Ontario Department of Mines Volume LVII; the study "is based on the examination of a suite of rocks and ores submitted . . . by Jas. E. Thomson". The publication is listed in the Bibliography at the end of this report, under (Thomson 1950).

MISCELLANEOUS—OTHER METALLICS

Property	Townships	References	Metals
O'Hare.....	McElroy.....	O.D.M. Vol. LIX, 1950, pt. 6, p. 52.....	molybdenum
Republic Tungsten (Kirkland Consolidated).....	Grenfell.....	Resident Geologist's files, Kirkland Lake...	gold, tungsten
Snailles.....	Boston.....	Resident Geologist's files, Kirkland Lake...	molybdenum

Industrial Minerals (Non-metallics)

Occurrences of chrysolite asbestos have been found in several places in the wide peridotite sill that strikes northwesterly across the north half of Skead township and the south half of McElroy township. The peridotite has been completely serpentized, and veinlets of asbestos are quite numerous, but no deposits approaching commercial quality have been discovered. Much of the sill is concealed by an overburden of sand and gravel.

Barite has been reported in veins occupying post-ore faults at the Lake Shore mine, and barite and

gypsum at the Wright-Hargreaves mine. None of these occurrences has any economic importance.

Throughout the greater part of the area, a thin mantle of overburden lies in the depressions between outcrops. It contains deposits of sand and gravel that are products of the Pleistocene continental glaciation. Such deposits have been opened at various points along the railway and highway; they supply local demands mainly for highway construction and mine backfill.

ANDERSON PROPERTY

Location	The property consists of 2 adjoining patented claims near the centre of Boston township. The claim numbers are: L.2577 and L.7069.
Chief Industrial Minerals Present	Pyrite and marcasite.
History and Development	The principal showings are on claim L.7069 staked by John T. Whalen in 1917. He transferred a major interest to Oscar Hojene in 1918. H. M. Anderson acquired the ground in 1924 and brought it to patent. Early work consisted of sinking a cluster of 5 pits in an irregular gossan zone about 100 feet wide on a west-facing slope in the northeast quarter of claim L.7069. About 150 feet south of these pits are several old trenches on another patch of gossan. The south claim, L.2577, was staked by Whalen in 1912 and patented by him in 1920.
Geology	<p>The claims are underlain by Keewatin volcanics and by a minor iron formation intruded by a sill-like mass of altered diorite. The volcanics consist of porphyritic flow rocks, tuffs, and some agglomerate of intermediate-to-acid composition; and altered lava of more basic composition. Dumps of considerable size adjacent to the cluster of pits contain massive iron sulphides intricately mixed with rock. These sulphides, which are predominantly marcasite, often weather out in rounded concretionary forms. They occur in the interstices of a shattered agglomerate. O.D.M. Map No. 1957-4 shows a fault separating andesitic lava from acid pyroclastics. This fault trends slightly west of north through the cluster of pits. In the old trenches to the south, the mineralization consists of pyrrhotite, magnetite, cube pyrite, and minor chalcopyrite.</p> <p>Rusty-weathering shear zones, up to 15 feet wide, occur on both contacts of the sill-like intrusion of diorite striking westerly across the centre of the property. Mineralization consists mostly of pyrite that may be massive over 1-foot widths. Some test-pitting and trenching have been done along both contacts.</p>
Production	None recorded.

References

O.D.M. Staking Records, Larder Lake Mining Division.
 O.D.M. Vol. LXVI, 1957, pt. 5, p. 31
 Report by O.D.M. Resident Geologist (1952) in the Kirkland Lake files.

Remarks

Property has been investigated on several occasions as a potential source of sulphur.

MISCELLANEOUS—INDUSTRIAL MINERALS

No.	Property	Townships	References	Mineral
24	Asbestos Corp.....	McElroy.....	Resident Geologist's files, Kirkland Lake....	Asbestos
462	McMillan, D.....	McElroy.....	O.D.M. Vol. LIX, 1950, pt. 6, pp. 49, 50....	Asbestos
477a	N. ½ Skead.....	Skead.....	O.D.M. Vol. LVIII, 1949, pt. 6, p. 29.....	Asbestos
477b	N. ½ Otto.....	Otto.....	Resident Geologist's files, Kirkland Lake....	Nepheline syenite
579a	S. ½ McElroy.....	McElroy.....	O.D.M. Vol. LIX, 1950, pt. 6, p. 37.....	Asbestos

Radioactive Indications

In the early 1950s, when prospecting for uranium was at its peak, a number of properties, chiefly in Boston and Otto townships, were tested by geiger counter for radioactive indications. No radioactive areas of possible economic significance were found in any of the locations examined.

The reader is referred to "Boston and Otto Townships, Notes on Radioactive Indications", in the O.D.M. Resident Geologist's files, Kirkland Lake, which describes the tests made on the following properties:

Property	Townships	References
Empire Gold (Paymaster Consolidated Mines Ltd.).....	Boston	Resident Geologist's files, Kirkland Lake
Evoy Claims.....	Boston	Resident Geologist's files, Kirkland Lake
Lunge Claims.....	Boston	Resident Geologist's files, Kirkland Lake
Yost Claims.....	Boston	Resident Geologist's files, Kirkland Lake
Simpson Farm.....	Otto	Resident Geologist's files, Kirkland Lake
S. ½ lot 8, con. V.....	Otto	Resident Geologist's files, Kirkland Lake
S. ½ lot 11, con. V.....	Otto	Resident Geologist's files, Kirkland Lake
N. ½ lot 3, con. V.....	Otto	Resident Geologist's files, Kirkland Lake

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1920: Kirkland Lake gold area; Ontario Dept. Mines, Vol. XXIX, pt. 4.
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 1921: Map No. 30c — Morrisette township; Ontario Dept. Mines. Scale, 1 inch to 1 mile.
 1923: Map No. 32e — Otto township; Ontario Dept. Mines. Scale, 1 inch to $\frac{1}{2}$ mile.
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 1941: Map No. 50a — McGarry township; Ontario Dept. Mines. Scale, 1 inch to 1,000 feet.
 1941: Map No. 50b — McVittie township; Ontario Dept. Mines. Scale, 1 inch to 1,000 feet.
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- 1949: Map No. 1949-3 — Skead township; Ontario Dept. Mines. Scale, 1 inch to 1,000 feet.
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MAP LIST

Owners, Properties, and Mines

The following table gives the location of all properties and mines marked on the map (back pocket). The properties of some owners are so widespread that no single location can be shown. Bracketed figures indicate that there is more than one location in the same township.

Owner, Property, or Mine	Location		Owner, Property, or Mine	Location	
	Township	No. on Map		Township	No. on Map
Alpha Larder Mines Ltd.	McVittie	1	Belrosa Claims	Lebel	25
Rouyn Reward	"	1	Bennett-Pacaud	Pacaud	26
Alschbach G. M. Co. Ltd.	Grenfell	2	Bidgood Kirkland G. Mines Ltd.	Lebel	27
Mylake	"	2	Bidcop	"	27
Amalgamated Kirkland G. M. Ltd.:			Cambro Kirkland	"	27
Canadian Kirkland	Teck	3a	Biltmore Claims	McVittie (2)	28
Honer Kirkland	"	3b	Hall Claims	"	28a
Hunton	"	3c	Bird Claims	Teck	29
Kirkland Hunton	"	3c		Gauthier	29
Kirkland-Kalgorlie	"	3d		Gauthier	30
Amalgamated Larder Mines Ltd.:			Biroco Mines Ltd.	"	30a
Barber Larder	McGarry	4a	Stobie-Flood	Teck	31
Cheminis	McVittie	4b	Black Gold Mines Ltd.	"	31
Ferland	"	4c	McKinnon	"	31
Harris Claims	McGarry	4d	Blaugrund Claims	"	32
Proprietary	McVittie	4e	Boisvert Claims	"	33
Sarcee	"	4f	Boland Claims	"	34
American Kirkland G. Claims	Teck	5	Bonnier Claims	McElroy	35
Amity Copper G. M. Ltd.	Pacaud	6	Bos Claims	Hearst	35a
Consol. Golden Arrow	"	6	Malone Lake Gold	McVittie	35b
Marge Copper Gold	"	6	Boston Creek Mining	Boston	36
Mirla Exploration	"	6	Kenzie	"	36
Anderson Claims (Boston)	Boston	7	R.A.P. Syndicate	"	36
Anglo-Swift	"	8	Bouzan Claims	Lebel	37
Anoki G. Mines Ltd.	Gauthier	9	Boyd-Kirkland	"	37a
Bankfield Consol	"	9	Brant Claims	Gauthier (3)	38
Elstone Duncan	"	9	Carroll Hefferman	Lebel	38a
Elstone Kirkland	"	9	Perry Kirkland	Gauthier	38b
Oriole	"	9	Briscoe Claims	Boston	39
Ansara Claims	Bernhardt	10	Brown Claims	Eby	40
Mayer Mining	Teck	10a	Bruce Mines Ltd.	McVittie	41
Arc Mining Syndicate	Hearst (2)	11	Burbank-Raymore	"	42
Brubaker Mining Synd.	"	11a	Burtho Gold Mines Ltd.	Eby	43
Arjon Gold Mines Ltd.	McGarry	12	God's Lake G.M. Ltd.	"	43
Christie	"	12	Rogick-Elliott-Clarke	"	43a
Cockshutt-McCallum	"	12	Pioneer G.M. Ltd.	"	43a
MaCallum	"	12	Burton Claims	Hearst	44
Armistice Gold Mines Ltd.	McGarry	13			
Jenner	"	13a	Calcora Mining & Development Synd.	Teck	45
Richie	"	13a	Campbell (A.E.) Claims	Grenfell	46
Roy	"	13a	Campbell (Dunc) Claims	McVittie	47
Asher Gold Mines Ltd.	Grenfell	14		Catharine	47
Aurora Larder	Boston	16	Campbell (R. J.) Claims	Boston	48
Avalard Mines Ltd.	Gauthier	17	Campbell-Jeanjacquet Claims	"	49
Buffalo Canadian	"	17	Canada First Claims	Lebel	50
New Belorrain	"	17	Granow	"	50
Rosen	"	17	Carbonate Larder	McGarry	51
Wojcieszyn	"	17	Carr Claims	McVittie	52
			Casakirk Gold Mines Ltd.	Teck	53
Baldwin Consol. Mines Ltd.	Eby	18	Belcher	"	53
Baldwin-Kirkland	"	18	Clark	"	53a
Iroquois-Kirkland	"	18	Devellierrs	"	53b
Kelmac	"	18	Abba	"	53c
Lucky-Kirkland	"	18	Casteck Mines Ltd.:		
Bargnesi Mines Ltd.	Boston	20	McKinnon	Teck	54a
Elsie Boston Lake	"	20	Stephenson	"	54b
Barry Hollinger G. Mines Ltd.	Pacaud	21	Cathroy Larder Mines Ltd.	McElroy	55
Boston-Hollinger	"	21	Mirado Nickel Mines Ltd.	"	55
Lebon Gold	"	21	Yama Gold	"	55
Patricia Synd.	"	21	Chaput Claims	Teck	56
Beauregard Claims	Gauthier	23	Charest Claims	McElroy	57
			Chavigny Gold Mines Ltd.	Otto	58

Owner, Property, or Mine	Location		Owner, Property, or Mine	Location	
	Township	No. on Map		Township	No. on Map
Chesterville Mines Ltd.	McGarry	59	Foundation Consolidated	McVittie	97
Rose Gold	"	59	Four Nations Cons. G.M. Ltd.	Grenfell	98
Shaver McGarry	"	59a	Campbell, (A. E.)	"	98
Cochrane Claims	Otto	60	Gibson Claims	Teck	100
Collins Claims	Boston	61	Gill Claims	Boston (2)	101
Columbus Kirkland	Teck	62	Glenora Gold Mines Ltd.	Lebel	102
Combined Larder Mines Ltd.	Hearst (2)	63	Gull Lake Mining Co.	"	102
Combined Goldfields	"	63	London Gull Lake	"	102
Larder Combined	"	63	Toronto Kirkland	"	102
Searchlight Larder Lake	"	63	Gogita Mining Syndicate	Boston	103
Comfort Kirkland Mines Ltd.	Teck	64	Gold Bank	Catharine	104
Connell Claims	Catharine	65	Gold Ridge	"	104
Continental Kirkland M. Ltd.	Lebel	66	Kordol	"	104
Croteau Claims	"	66	Goldbanks-Kirkland Mines Ltd.	Teck	105
Kirkland Munro	"	66	Goldbanks Mines	"	105
Post Claim	"	66	Hurd & Pollock	"	105
Corson Claims	Hearst	67	Gold King	Hearst	106
Cotter Claims	Catharine	68	Goldwyn	Gauthier	108
Crystal Extension	Gauthier	69	Golden Gate M. Co. Ltd.	Teck	109
Donaldson	"	69	Gateford M. Ltd.	"	109
Crystal Kirkland	Lebel	69a	Kirkland Gateway	"	109
Cumming Claims	McElroy	70	Kirkland Golden Gate	"	109
Currie Claims	Boston	71	Lucky Cross	"	109
Cusiagua Syndicate	Gauthier	72	Crescent Kirkland	Otto	109a
			Swastika Gold	"	109a
Dalby Larder Gold Mines Ltd.	McVittie	73	Golden Summit	Maisonville	110
Dane Copper Company Ltd.	Lebel	74	Goodfish Gold M. Ltd.	Morrisette	111
Consular Harker	"	74	Brennan	"	111
Dane Mining Company	"	74	Costello	"	111
Iso-Uranium Mines Ltd.	"	74	Martin	"	111
Kirk Cobalt	"	74	Miles-Martin	"	111
Ogilvie-McKinnon	"	74	Providence G. M. Ltd.	"	111
Quinte	"	74	Gordon Lebel	Lebel	112
Darmac Gold Mines Ltd.	Lebel	75	Catharine Lebel	"	112
Dion Claims	Hearst	76	Kirkland Diorite	"	112
Dominion Golden Leaf Syndicate	"	77	Pinelle-Kirkland	"	112
Dominion Gulf	Eby	79	Gracie Claims	Hearst	113
	Boston	79	Graff-Kaplan-Hahn	Eby	114
Dominion Kirkland	Teck	80	Grainger Claims	McVittie	115
Donnell-Myles	Lebel	81	Granby Kirkland	Lebel	116
			Great Larder Gold Mines Ltd.	McVittie	117
Earl Gold Mines	Hearst	82	Kari-Antonen	"	117
East Kirk	Lebel	83	Grenfell-Kirkland Gold Mines	Grenfell	118
Eby Twp., Lots 3-6, Con. III	Eby	84	Stitt	"	118
Ed. Hargreaves Claims	Lebel	85	Gull-Kirkland Mines Ltd.	Lebel	118a
Grasset Lake M. Ltd.	"	85			
Tamminen	"	85	Harris Claims	McElroy	119
Empire Gold Mines Ltd.	Boston	86	Hartford-MacClure Gold Mines Ltd.	"	119a
Erin Kirkland Mines Ltd.	Lebel	87	Harvey Kirkland Mines Ltd.	Lebel	120
Errowana Gold	McElroy	88	Belteco Kirkland M. Ltd.	"	120
Evenlode Gold Mines Ltd.	Lebel	88a	Elroy G. M. Ltd.	"	120
Laclothian	"	88a	Haynes Claims	Gauthier	120a
Roche Syndicate	"	88a	Hay Syndicate	McGarry	121
Evoy Claims	Boston (3)	90	Hay-Thompson	McGarry (2)	122
Evoy and Collins Claims	"	90	Healy	Boston	122a
			Hearst Larder Mines Ltd.	Hearst	124
Federal Kirkland Mining Co.	Teck	91	Watling Larder	"	124
Cadamet	"	91	Hearst Larder (S. Group)	"	124a
Day	"	91	Artben Mining Synd.	"	124a
Kirkland Lederal	"	91	Hecmac Syndicate	Grenfell	125
Wishman	"	91	LaGace	"	125
Kirkland Combined	Lebel	91a	Pepin	"	125
Fidelity Mining & Dev. Co. Ltd.	Teck	92	Hersey Claims	McVittie	126
Fisher Gold	Teck (2)	93	Hilltop Gold Mines Ltd.	Catharine	127
Florena Kirkland G. Mines Ltd.	"	94	Turzone	"	127
Highland Kirkland	"	94	Hill Claims	McElroy	128
Foley Claims	Gauthier	95	Hudson Bay Mines Ltd. (Claim MR 25)	"	129
Forward Mining Synd.	Katrine	96	Hughes Claims	Pacaud	130
Anderson	"	96	Hughes (McElroy)	McElroy	131
Misema L.M. Corp.	"	96			

Owner, Property, or Mine	Location		Owner, Property, or Mine	Location	
	Township	No. on Map		Township	No. on Map
Imerson Claims.....	McVittie	132	Hudson-Rand.....	Teck	167
Anglo Canadian Explorers.....	"	132	Kirkland Premier.....	"	167
Kitchener-Kirkland.....	"	132	Montreal Kirkland.....	"	167
Irish Claims.....	McElroy	133	Montreal Ontario.....	"	167
Iroquois-Kirkland.....	Teck	134	Ontario Kirkland.....	"	167
Ivanhoe Boston.....	Boston	135	Standard Kirkland.....	"	167
Ivan Larder.....	McGarry	136	Kirkland Hudson Bay Group.....	Teck	168
Jackson Claims.....	Teck	137	Hudson Bay Mining Co.....	Lebel	168
Jean Petit Claims.....	McElroy	138	Kirk-Hudson.....	Teck	168
Dream.....	"	138	Northgate Exploration.....	"	168
Jompetie.....	"	138	Kirkland Lake Gold Mining Co. Ltd....	Teck	169
Jones & Laughlin Steel Corp. Ltd.....	Boston (2)	139	Beaver Consolidated.....	"	169
Dominion Gulf (Group 1, 2).....	"	139	Kirkland Minerals.....	"	169
Jalore Mining Co. Ltd.....	"	139	McKane Claim.....	"	169
Johnson Claims (Eby).....	Eby	140	Chaput Hughes.....	"	169a
Johnson Claims (McElroy).....	McElroy	141	Grozelle Kirkland.....	"	169b
Johnson (M).....	Pacaud	141a	Kirkland Larder Mines Ltd.....	Gauthier	170
Johnson (McVittie) Claims.....	McVittie	142	Duffett.....	"	170
Coniagas.....	"	142	Fork Lake.....	"	170
Jordon Claims.....	Gauthier	143	Wadasa.....	"	170
Joy Claims.....	McVittie	144	Walsh Syndicate.....	"	170
Judge Claims.....	McElroy	145	Kirkland Syndicate.....	McVittie	171
Jimgo.....	"	145	Kirkland Townsite Gold Mines Ltd....	Teck	172
Kelly Kirkland Mines Ltd.....	Otto; Teck	146	Anglo Canadian Exp. Ltd.....	"	172
Kelsina Kirkland.....	Gauthier	147	Kirkroyale Gold Mines Ltd.....	Lebel	173
Kenakott-Kirkland.....	Lebel	148	Conroyale Gold M. Ltd.....	"	173
Kennedy Boston.....	Catharine	149	Harrison.....	"	173
Kentlake.....	Gauthier	150	Kirk Gold Mines Ltd.....	"	173
North Rand.....	"	150	Kir-Vit Gold Mines Ltd.....	McVittie	174
Kerr-Addison Gold Mines Ltd.....	McGarry	151	Grainger-Yuill.....	"	174
Associated Goldfields.....	"	151	Arthur-Costello.....	"	174
Kerr-Addison Claims.....	"	151	Kitchener-Kirkland.....	Teck	175
Proprietary Mines Ltd.....	"	151	Knox Claims.....	McElroy	176
Reddick Claims.....	"	151	Philibert.....	"	176
Kerrigan Gold Mines Ltd.....	"	152	Wright-Hargreaves.....	"	176
Kerronac Mining Co. Ltd.....	"	153	Kohinoor Gold Mines Ltd.....	McVittie	178
Kidihawk Mines Ltd.....	McElroy (2)	154	Caplan.....	"	178
Val Burda Prosp. Synd.....	"	154	Shepherd.....	"	178
Killoran Claims.....	Teck	155	Ventures.....	"	178
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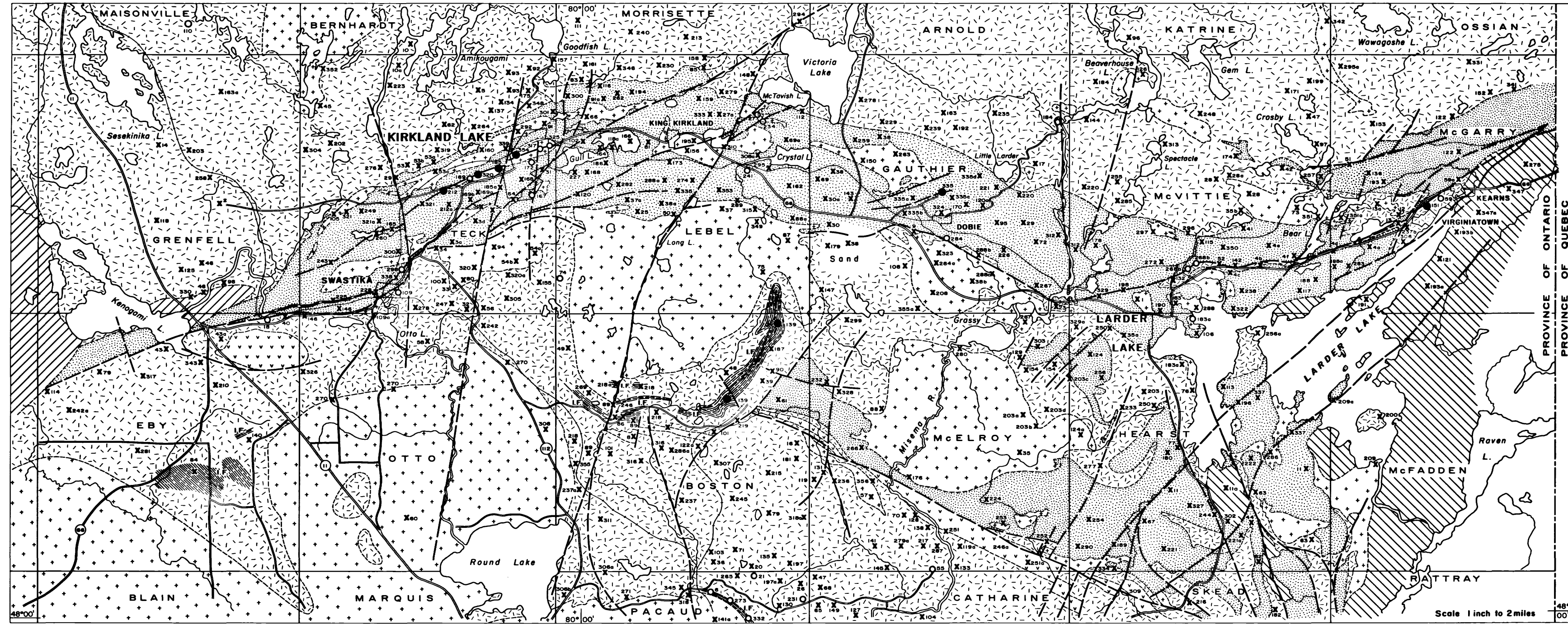
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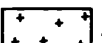
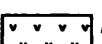

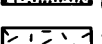
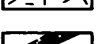
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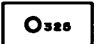



LEGEND

GENERALIZED GEOLOGY

-  Cobalt sedimentary rocks.
-  Acid intrusive rocks.
-  Intermediate and basic intrusive rocks.
-  Older sedimentary and volcanic rocks (Timiskaming series).
-  Acid and basic volcanic rocks and undifferentiated diorites.
-  I.F. Iron formation.

SYMBOLS

-  212 Producing Mine.
-  325 Past Producer.
-  X220 Other Properties.

NOTES

Properties indicated by numbers on the map are named under the Property List of the accompanying report.

For detailed geology of townships see list of Geological Maps in report.

SOURCE OF INFORMATION

Compiled by W. S. Savage, 1963.

KIRKLAND LAKE — LARDER LAKE AREA SHOWING PROPERTY LOCATIONS AND GENERAL GEOLOGY

Scale 1 inch to 2 miles