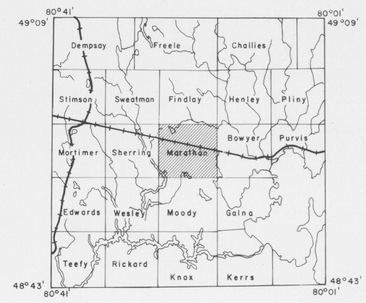
MARATHON TOWNSHIP

DISTRICT OF COCHRANE, ONTARIO



Scale: 1 inch to 1/4 mile

TABLE OF LITHOLOGICAL UNITS
KIRKLAND LAKE DATA SERIES

CENOZOIC
PLEISTOCENE AND RECENT
- 18a ORGANIC DEPOSITS
  Open and semi-open bogs
- 18b COCHRANE DEPOSITS
  Clay till
- 18c BARLOW–OJIBWAY DEPOSITS
  Varved sediments
  Sand and gravel deposits
- 18d GLACIO–FLUVIAL DEPOSITS
  Esker complexes; associated outwash sand and gravel deposits
- 18e GROUND MORAINE DEPOSITS
  Sandy grey boulder till, with minor contained stratified drift, resting on bedrock.

UNCONFORMITY

MESOZOIC
- 17 Kimberlite

INTRUSIVE CONTACT

PALEOZOIC
LOWER AND MIDDLE SILURIAN
- 16a Clinton (Thornloe) Formation: limestone, dolomite, sandstone
- 16b Wabi Formation: limestone, shale

MIDDLE AND UPPER ORDOVICIAN
- 15a Dawson Point Formation: shale
- 15b Farr Formation: limestone
- 15c Bucke Formation: limestone, shale
- 15d Gulgues Formation: sandstone

UNCONFORMITY

PRECAMBRIAN
LATE PRECAMBRIAN (PROTEROZOIC)
MAFIC INTRUSIVE ROCKS[g]
- 14 Diabase dikes

INTRUSIVE CONTACT

MIDDLE PRECAMBRIAN (PROTEROZOIC)
ALKALIC INTRUSIVE ROCKS[e]
- 13 Syenite, nepheline syenite, lamprophyre

MAFIC INTRUSIVE ROCKS[f]
- 12 Diabase, transition rock, and granophyre sheets and dikes

INTRUSIVE CONTACT

COBALT GROUP
- 11 Lorrain Formation: quartzite, arkose
- 10 Gowganda Formation
  - 10 Undifferentiated
  - 10a Firstbrook Member: argillite, siltstone, greywacke, arkose
  - 10b Coleman Member: conglomerate, greywacke, quartzite, arkose, argillite

UNCONFORMITY

EARLY PRECAMBRIAN (ARCHEAN)
MAFIC INTRUSIVE ROCKS[e]
- 9 Diabase dikes

INTRUSIVE CONTACT

ALKALIC INTRUSIVE ROCKS[d]
- 8 Syenite, monzonite, lamprophyre[h]

INTRUSIVE CONTACT

ALKALIC METAVOLCANICS[b]
- 7 Trachyte, leucitic trachyte; flows, tuff, breccia

METASEDIMENTS[J]
- 6 Conglomerate, greywacke, siltstone, slate, argillite, iron formation[b]
- 5 Greywacke, siltstone, slate, iron formation[e]

FELSIC INTRUSIVE ROCKS[J]
- 4 Granitic intrusive rocks
- 4a Quartz porphyry, quartz-feldspar porphyry, feldspar porphyry, granophyre, felsite[h]
- 4b Trondhjemite, granodiorite, quartz monzonite: simple batholiths and stocks[h]
- 4c Trondhjemite, granodiorite, quartz monzonite, quartz diorite, aplite, pegmatite, migmatite: complex batholiths

INTRUSIVE CONTACT

FELSIC METAVOLCANICS AND VOLCANICS[a J]
- 3 Undifferentiated, rhyolite
- 3a Iron formation and ferruginous chert
- 3b Flows
- 3c Pyroclastic rocks

INTRUSIVE CONTACT

METAMORPHOSED MAFIC AND ULTRAMAFIC INTRUSIVE ROCKS[c J]
- 2 Undifferentiated
- 2a Gabbro, diorite
- 2b Peridotite, dunite, pyroxenite, serpentinite

INTRUSIVE CONTACT

INTERMEDIATE AND MAFIC METAVOLCANICS[a J]
- 1 Undifferentiated dacite, andesite, and basalt
- 1a Intermediate flows
- 1b Intermediate pyroclastic rocks
- 1c Mafic flows
- 1d Mafic pyroclastic rocks

a Formerly classified as Keewatin
b Formerly classified as Timiskaming
c Formerly classified as Haileyburian
d Formerly classified as Algoman
e Includes north-trending dikes of Matachewan swarm
f Includes Nipissing and Sudbury-type
g Includes Keweenawan
h Several ages; some units appear to be intrusive equivalents of volcanic formations whereas others postdate volcanism
J Rocks in these groups are subdivided lithologically; the order does not necessarily imply age relationship within or among groups

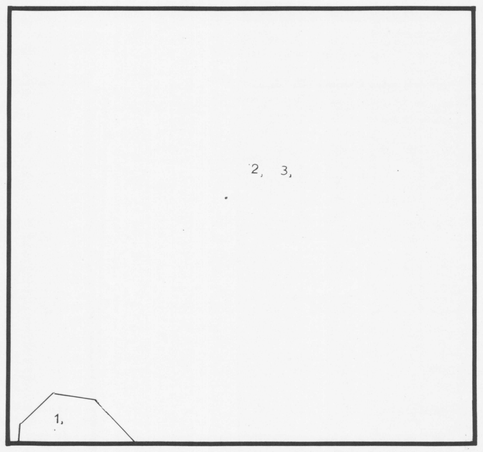
GEOLOGICAL AND MINING SYMBOLS FOR KIRKLAND LAKE DATA SERIES

- Glacial striae.
- Esker, medial ridge.
- R — Small bedrock outcrop.
- Bedding, top unknown; (inclined, vertical).
- Bedding, top (arrow) from grain gradation; (inclined, vertical, overturned).
- Bedding, top (arrow) from cross bedding; (inclined, vertical, overturned).
- Lava flow; top (arrow) from pillows shape and packing.
- Schistosity; (horizontal, inclined, vertical).
- Gneissosity, (horizontal, inclined, vertical).
- Layering, (horizontal, inclined, vertical).
- 30° — Lineation with plunge.
- Geological boundary, observed.
- Geological boundary, position interpreted.
- Geological boundary, deduced from geophysics.
- Fault; (observed, assumed). Spot indicates down throw side, arrows indicate horizontal movement.
- Lineament.
- Jointing; (horizontal, inclined, vertical).
- Drag folds with plunge.
- Anticline, syncline, with plunge.
- Drill hole; (projected vertically). Overburden shown.
- Drill hole in overburden only; (vertical or collar, inclined). Overburden shown.
- 150' — Shaft; depth in feet.
- Mineral occurrence at surface.
- Airborne electromagnetic anomaly (Canadian Aero System).
- Airborne electromagnetic anomaly (Questor 6 Channel Input System).
- 2 channel response.
- 3 channel response.
- 4 channel response.
- 5 channel response.
- 6 channel response and coincident magnetic anomaly.
- AM — Airborne magnetometer anomaly.
- M — Ground magnetometer anomaly.
- Ground electromagnetic conductor (VEM-Vert-loop; HEM-Horizontal loop; VLF-Very low freq.; Turam; JEM-Crone EM-16).
- IP — Induced Polarization anomaly
- SP — Spontaneous Polarization anomaly
- G — Gravity anomaly
- ra — Radiometric anomaly
- R — Resistivity anomaly

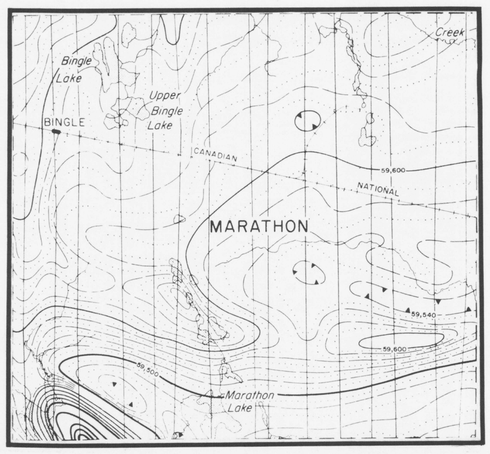
DATA FILED WITH THE ONTARIO DEPARTMENT OF MINES AND NORTHERN AFFAIRS RESIDENT GEOLOGIST AT KIRKLAND LAKE Through February 1972	GEOLOGICAL	DIAMOND DRILLING	AIRBORNE MAGNETOMETER	AIRBORNE ELECTROMAGNETOMETER	GROUND MAGNETOMETER	VERTICAL LOOP ELECTROMAGNETOMETER	HORIZONTAL LOOP ELECTROMAGNETOMETER	TURAM ELECTROMAGNETOMETER	JEM	INDUCED POLARIZATION	VLF	RESISTIVITY	GRAVITY	GEOCHEMICAL	OTHERS
1. Glen Lake Silver Mines Ltd.			62												
2. Mistango River Mines Ltd.					63										63*
3. North American Rare Metals Ltd.			61												

* Shallow refraction seismic survey

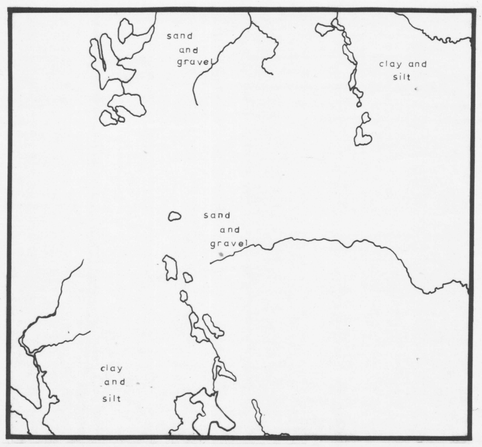
Note:
The numbers on the above list stand for the year when the work was done, e.g., 66 for 1966. On the accompanying DATA LOCATION MAP, only areas for which work was submitted to the Department are outlined, and thus a company may hold more ground than indicated here. The numbers on the DATA LOCATION MAP and any circled numbers refer to the company list above.



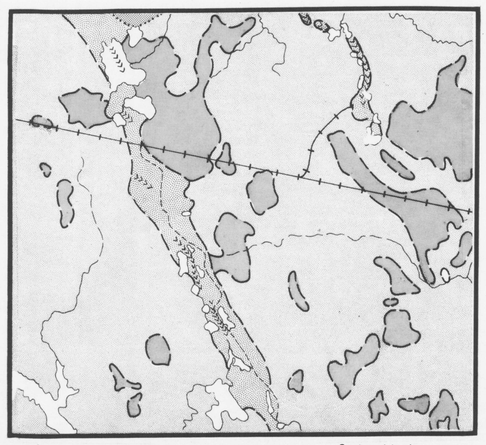
DATA LOCATION MAP Scale: 1 inch to 1 mile



AEROMAGNETIC MAP Scale: 1 inch to 1 mile



PROVISIONAL GEOLOGICAL INTERPRETATION Scale: 1 inch to 1 mile



SURFICIAL GEOLOGY Scale: 1 inch to 1 mile

METAL AND MINERAL REFERENCE

For Kirkland Lake Data Series

Ag ..... Silver	mo ..... Molybdenite
asb ..... Asbestos	Ni ..... Nickel
Au ..... Gold	Pb ..... Lead
Cd ..... Cadmium	Pd ..... Palladium
Co ..... Cobalt	pent ..... Pentlandite
cp ..... Chalcopyrite	po ..... Pyrrhotite
Cr ..... Chromium	Pt ..... Platinum
Cu ..... Copper	py ..... Pyrite
ep ..... Epidote	qcv ..... Quartz-carbonate vein
Fe ..... Iron	qv ..... Quartz vein
fl ..... Fluorite	serp ..... Serpentine
gf ..... Graphite	sp ..... Sphalerite
gn ..... Galena	spec ..... Specularite
mag ..... Magnetite	talc ..... Talc
mar ..... Marcasite	Sn ..... Tin
ml ..... Millerite	Zn ..... Zinc

Sources of Information

Compiled by the Geological Survey of Canada in co-operation with the Ontario Department of Mines and Northern Affairs from data on file with the Resident Geologist (Ontario Department of Mines and Northern Affairs), Kirkland Lake.

NTS Reference 42 A/16
ODM-GSC Aeromagnetic Map 2355G
ODM Geological Compilation Series Map 2046
GSC Surficial Geology Map 46-1959