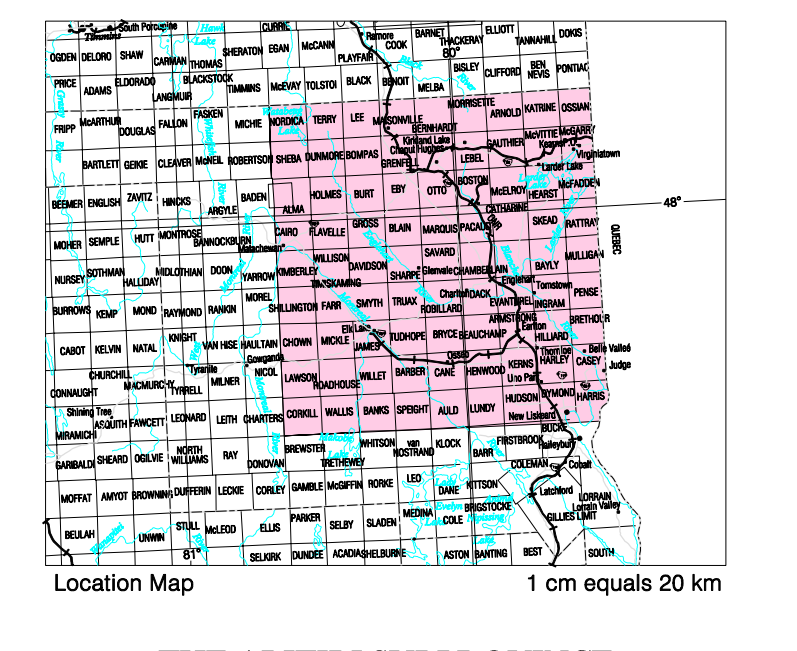


PRECAMBRIAN GEOLOGY GEOLOGICAL COMPILATION OF THE KIRKLAND LAKE AREA, ABITIBI GREENSTONE BELT

Scale 1:100 000
2000 m 0 2 4 km

NTS References: 31 M6, 12, 13, 32 D1, 8, 41 P7, 8, 9, 10, 15, 16;
62-61, 12, 1-8

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THE ABITIBI SUBPROVINCE

The Abitibi Subprovince is an 800 by 300 km Archaean 'granite-greenstone' domain situated along the southern margin of the Superior Province. It is demarcated by a series of northeast-trending faults with a range of ages from 2.75 to 2.67 Ga (Jackson and Fyfe 1991). Historically, the Abitibi greenstone belt was considered to be a portion of the Abitibi Subprovince extending to the western margin of the Abitibi Subprovince. However, recent mapping and geochronological evidence (Heath et al. 1999) shows that the Abitibi greenstone belt contains many structures and stratigraphic ages typical of the Abitibi belt in the Timmins-Kirkland Lake area and is therefore interpreted to represent a deeper crustal level of a core-contiguous Abitibi greenstone belt extending to the Koozebuc Structural Zone.

The Abitibi greenstone belt is one of the world's largest, best preserved and most economically productive greenstone belts in the world.

The Kirkland Lake map sheet covers the area from about 7 km east of the town of Massawa to the Quebec border. Rocks are classified on the basis of their current lithology using textures, structures and both approximate and specific compositions to refine the classification. Geological information has been compiled from previous maps and mapping. New interpretations of the extent of lithologic units, specifically in the area outlined on this map, have greatly benefited from the use of the reprocessed geophysical data for this area (Gusta 1995, 1998), as well as geochronological data allowed for the further subdivision of the metasedimentary rocks.

Several past-producing gold mines are found in this area, including those of the Kirkland Lake and Lake Simcoe basins, respectively. Gold-bearing shear zones are generally sub-parallel to stratigraphy and are delineated by numerous cross-cutting faults. The Kirkland Lake area and the Lake Simcoe basin are the most significant gold-bearing structures in this area.

SYMBOLS

	Geological contact		Bedding
	Fault		Unsubdivided, facing direction unknown (inferred, vertical, trend only)
	Anticline		Compositional layering and/or parallel foliation (inferred, vertical, trend only)
	Syncline		Foliation, defined by mineral, unknown generation (inferred, vertical, trend only)
	Bedding, facing direction known		Foliation, defined by mineral, known generation (inferred, vertical, trend only)
	Bedding, facing direction known from grading and crossbedding		Lineation, undefined, unknown generation (plunging may be indicated)
	Bedding, facing direction known from sedimentary structures other than grading and crossbedding		Bedding, pillow, facing direction known (trend only, inclined)
	Geochronological sample location		Geochronological sample result

SOURCES OF INFORMATION

This geological compilation of the Kirkland Lake area is the third in a series of 1:100 000 maps and GIS data sets of the Abitibi Subprovince in Ontario being compiled over the next few years.

This geological map of the Kirkland Lake area was compiled from published maps and reports of the Ontario Geological Survey and the Geological Survey of Canada. In addition, information from unpublished reports and maps on file with the Ontario Geological Survey, university theses, papers in professional journals, geological maps and satellite images was incorporated.

Geological interpretation was further enhanced by utilizing the Earth Resources and Land Information System (ERLIS) databases such as the Assessment & Resource Inventory (ARI), the Digital Data Base (DDb), the Lithochemical (LIG) database and the Mineral Deposit Inventory (MDI) database. Other data sets used include satellite imagery including Landsat Thematic Mapper images and RADARSAT radar images and Digital Elevation Model (DEM) produced by the Ministry of Natural Resources, Ontario.

Base map assembled by the Ontario Geological Survey. A vector map of Ontario Digital Topographic Data Base (1:20 000 Ontario Basic Mapping Program (OBMP) map was digitally compiled at a scale of 1:50 000 based on the Universal Transverse Mercator (UTM) projection and grid system, zone 17, North American Datum 1987.

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Ayer, J.A., Berger, B.R. and Towell, N.F. 1999. Geological compilation of the Lake Abitibi area, Abitibi greenstone belt, Ontario Geological Survey, Preliminary Map P.3376, scale 1:100 000.

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AGENCY INFORMATION

Geological compilation and interpretation by J.A. Ayer and N.F. Towell.
Compilation of mineral deposit data by J.A. Ayer and N.F. Towell.
Preparation of base map by L. Valdes.
Preparation of geophysical and satellite imagery by L. Valdes and E. Anyos.
GIS compilation of data by L. Valdes and E. Anyos.

To enable the rapid dissemination of information, this map has not received a technical edit. Discrepancies may occur for which the Ontario Ministry of Northern Development and Mines does not assume any liability. Users should verify critical information.

Issued 2000.

Information from this publication may be quoted if credit is given. It is recommended that reference to this map be made in the following form:
Ayer, J.A. and Towell, N.F. 2000. Geological compilation of the Kirkland Lake area, Abitibi greenstone belt, Ontario Geological Survey, Preliminary Map P.3425, scale 1:100 000.

MINERAL DEPOSIT TYPE

- Felicit to Intermediate Intrusion-Associated Deposits
- Alkalic Intrusion-Associated Deposits
- Alkalic to Intermediate Intrusion-Associated Deposits
- Sediment-Associated Deposits
- Volcanic-Associated Deposits
- Unknown deposit type

MINERAL DEPOSIT SIZE

- Mine
- Prospect
- Occurrence

MINERAL DEPOSIT COMMODITY*

- Ag = (Ag, Cu, Ni, Pt, Zn, U)
- Asbestos
- Au = (Au, Bi, B, Co, Cu, Diamond, Fe, Mn, Ni, Pb, U, W, Zn)
- Barite = (Ba, Pb, Zn)
- Ca = (Ca, Ni)
- Cu = (Ag, Au, Barite, Co, Fe, Mn, Ni, Pb, W, Zn)
- Diamond
- Dolomite = (Limestone)
- Fe = (Ag, Au, Cu, Zn)
- Mo = (Ag, Cu)
- Nepheline
- Ni = (Ag, Cu, Pb)
- Pb = (Ag, Cu, Zn)
- U = (Cu)
- W = (Au)
- Zn = (Ag, Au, Cu, Ni, Pb)

*Abbreviations used for commodities:

Ag = silver; Au = gold; B = boron; Bi = bismuth; Co = cobalt; Cu = copper; Fe = iron; Mo = molybdenum; Ni = nickel; Pb = lead; U = uranium; W = tungsten; Zn = zinc.

PRODUCING AND PAST-PRODUCING MINES

1. FRY	28. TOBRIN
2. MORRISON, B.L.	29. KIRKLAND
3. SHANE-DARRAGH	30. DANE
4. LUCKY-GODFREY	31. MORRIS-KIRKLAND
5. ETHEL	32. BEZCO
6. WINTHROP	33. MOFFAT-HALL
7. MANMATHA'S QUARRY	34. ISCORON LABEL
8. DIAMOND TWP DUMP QUARRY	35. ADAMS
9. BREAULT QUARRY	36. MARSHALL BOSTON SOUTH
10. HARLEY QUARRIES	37. AMY
11. HANMAN	38. PATTERSON
12. LANGRS	39. CAMERON, C.H.
13. PESNAK	40. SARRY-HULLINGER
14. SWASTRA	41. GOLD HILL
15. TESREN	42. EASTINGS
16. GOLDEN GATE	43. CATHROY
17. ST. JOSEPH	44. LUPIN CANADA
18. GRACE EAST	45. LUPIN BEAVER
19. MACASIA	46. MOSEAN
20. KIRKLAND LAKE	47. LALQUIER
21. TEE-HUGHES	48. ONICK
22. LAKE SHORE	49. CHEMINS
23. EASTMIDDLE	50. CHEMINS
24. WRIGHT-HARGREAVES	51. VILLET-LANDER
25. KIRKLAND TOWNSHIP	52. BARBER-LARDER
26. HUSCH-HAND SOUTH	53. HERR-KADISON
27. SYLVANIE	54. CHESTERVILLE

