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LEGEND FOR HALLIDAY AND MIDLOTHIAN TOWNSHIPS

CEANOZOIC  
 RECENT AND PLEISTOCENE  
 Glacial drift, gravel, sand and silt  
 UNCONFORMITY

PRECAMBRIAN  
 PROTEROZOIC  
 LATE MAFIC INTRUSIVE ROCKS  
 9 Diabase  
 INTRUSIVE CONTACT

HURONIAN  
 COBALT GROUP (Googanda Formation)  
 8 Undifferentiated  
 8a Conglomerate  
 8b Greywacke, quartzite and arkose  
 8c Argillite  
 UNCONFORMITY

ARCHEAN  
 MAFIC INTRUSIVE ROCKS (Matachewan)  
 7 Diabase  
 INTRUSIVE CONTACT

PLINK INTRUSIVE ROCKS  
 6a Medium-grained granitic dikes  
 6b Fine-grained porphyry (dikes)  
 INTRUSIVE CONTACT

ULTRAMAFIC AND MAFIC INTRUSIVE ROCKS  
 5 Undifferentiated  
 5a Olivine, pyroxenite, dunite  
 5b Amphibolite  
 INTRUSIVE CONTACT

METASEDIMENTS<sup>a</sup>  
 4 Undifferentiated  
 4a Arkose  
 4b Green sand  
 4c Silty argillite  
 4d Conglomerate  
 4e Sericitic and sedimentary rocks  
 4f Pyroclastic sedimentary rocks  
 DISCONFORMABLE AND INTERFINGERING CONTACT

FELSIC METAVOLCANICS<sup>b</sup>  
 3 Undifferentiated  
 3a Rhyolite-dacite  
 3b Pillowed dacite  
 3c Amygdaloidal rhyolite-dacite  
 3d Rhyolite-dacite breccia  
 3e Porphyritic rhyolite-dacite  
 3f Rhyolitic tuff  
 3g Sericitic schist  
 3h Chlorite-sericitic schist

INTERMEDIATE METAVOLCANICS  
 2 Undifferentiated  
 2a Andesite  
 2b Pillowed andesite  
 2c Amygdaloidal andesite  
 2d Porphyritic andesite  
 2e Andesite-dacite tuff-agglomerate-breccia

MAFIC METAVOLCANICS  
 1a Massive basalt

<sup>a</sup> Some volcanic rocks are younger than the sedimentary rocks.  
<sup>b</sup> The metavolcanic rocks are interstratified, but felsic volcanic rocks predominate in the lower part of the stratigraphic succession. The order does not imply age relationships.

□ Breccia  
 □ Carbonatized Rock

GEOLOGICAL AND MINING SYMBOLS

▬ Glacial striae.	▬ Geological boundary, observed.
▬ Parabolic sand dunes.	▬ Geological boundary, position interpreted.
✱ Small bedrock outcrop.	▬ Geological boundary, deduced from geophysics.
▬ Area of bedrock outcrop.	▬ Fault; (observed, assumed).
▬ Bedding, horizontal.	▬ Lineament.
▬ Bedding, top unknown; (inclined, vertical).	▬ Drag folds with plunge.
▬ Bedding, top (arrow) from grain gradation; (inclined, vertical, overturned).	▬ Anticline, syncline, with plunge.
▬ Bedding, top (arrow) from cross bedding; (inclined, vertical, overturned).	○ Drill hole; (vertical, inclined).
▬ Lava flow; top (arrow) from pillows shape and packing.	▬ Vein, vein network. Width in inches.
▬ Schistosity; (horizontal, inclined, vertical).	▬ Shaft; depth in feet.
▬ Banding; (horizontal, inclined, vertical).	

MINERAL OCCURRENCE REFERENCE

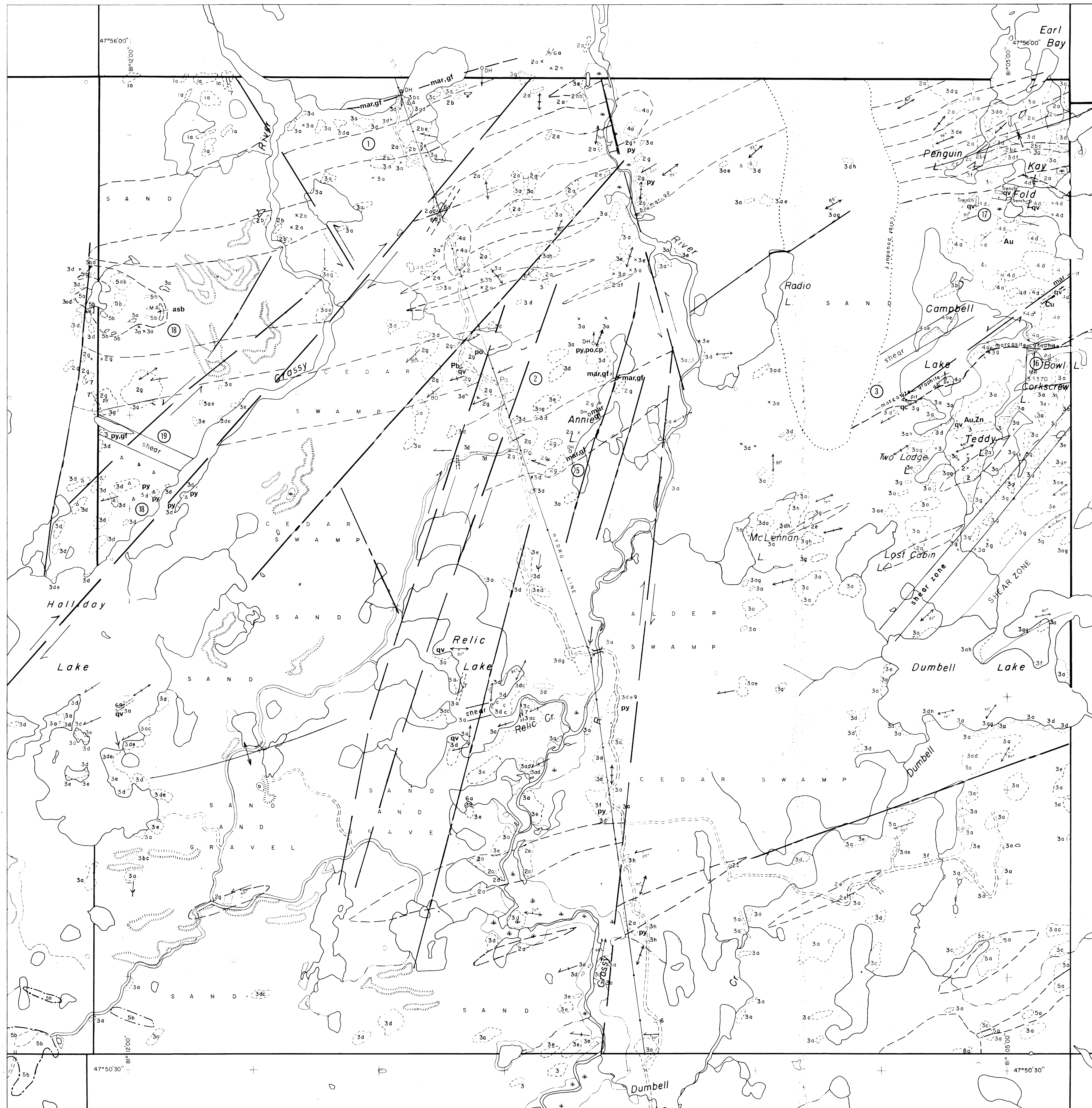
asb	Asbestos	Ni	Nickel
Au	Gold	Pb	Lead
Ag	Silver	po	Pyrrhotite
Cu	Copper	py	Pyrite
gr	Graphite	qtz	Quartz-carbonate
hm	Homelite	q.v.	Quartz vein
mar	Marcasite	Zn	Zinc

LIST OF PROPERTIES AND AREAS OF MINERAL EXPLORATION FOR HALLIDAY AND MIDLOTHIAN TOWNSHIPS

1. Anax Exploration Incorporated, Adele group
2. Anax Exploration Incorporated, Pat group
3. Anax Exploration Incorporated, Barbara group
4. Asbestos Lloyd Mines Limited (MR.18031-6)
5. Cominco Limited, Halliday township
6. Cominco Limited, Midlothian township
7. 8. Dominion Gulf Company
9. Lamothe, L.
10. Laroma Midlothian Mines Limited.
11. Miller, Thomas Henry, Executor (TR. 1929-31)
12. Morgan, C.R.
13. Parsons, Garfield E. (MR.20051)
14. Pitchvein Mines Limited
15. Riocanex Limited
16. Stairs Exploration and Mining Company Limited
17. Sylvanite Gold Mines Limited
18. Talisman Mines Limited
19. Texas Gulf Sulphur Company Incorporated
20. Vanclief, Wilbert Earl (MR.18070-4, 18066-9)

SOURCES OF INFORMATION

Geology by E.G. Bright and assistants, 1966.  
 Marshall, H.J., Geology of Midlothian Township, Ontario Dept. Mines, Vol. LVI, 1947, pt. 5, accompanied by Map 1947-4.  
 Geological and geophysical maps and reports of mining companies.  
 Base map derived from maps of the Forest Resources Inventory of the Ontario Department of Lands and Forests, with revisions by E. G. Bright.  
 Magnetic declination, 1966, approximately 11°W.  
 Issued 1967. Additions and corrections, May 1968. Re-issued 1968.



MARGINAL NOTES FOR HALLIDAY AND MIDLOTHIAN TOWNSHIPS

**Location and Access:** Halliday and Midlothian townships, which are on the borders of the Districts of Sudbury and Timiskaming are situated 18 miles west of Matachewan. They are easily accessible via Highway 566. The route follows 28 miles of good secondary gravel road to a 9-mile access road which extends southward to Stairs Midlothian mine. Further westward on the main gravel road, logging roads and an Ontario Hydro road give ready access to Halliday township.

**Mineral Exploration:** There have been four periods of particular staking activity in Midlothian and parts of Halliday townships, namely 1909, 1917, 1944 and 1962.

In 1962, the Sherwood Gold Mines property in Midlothian township was acquired by Stairs Exploration and Mining Co. Ltd. by July 1965, 1,928 feet of trenching, 45,977 feet of surface diamond drilling, 7,647 feet of underground drilling, and 30 square miles of air-borne geophysical coverage had been completed. The Stairs mine produced 2,674 oz. gold and 1,318 oz. silver valued at \$100,729 from Sept. 1965 to Apr. 1966. The company is now engaged in further exploration in the area.

Geological and geophysical surveys were conducted over many of the adjoining claim groups and diamond drilling programs were carried out on favorable zones by Laroma Midlothian Mines Ltd. during 1963 and 1964; Riocanex in 1963; Pitchvein Ltd. in 1963 and Halliday Mines Ltd. during the summer of 1964.

In 1952 and 1953, The Dominion Gulf Co. optioned the Miller claims (TR 1929, 1930, 1931) in Midlothian township. Drilling and surface work on this zone of ultramafic intrusive rocks, indicated an asbestos fibre zone 1,200 feet long and with probable average width of 200 feet. In the summer of 1956, further work was carried out on the nickel showing on the south shore of Bray Lake.

In 1965 a geophysical survey and a minor amount of drilling was done by Cominco Ltd. on the southwest side of Lloyd Lake in Midlothian township and on the west shore of Annie Lake in Halliday township.

**General Geology:** Precambrian metasediments consisting mainly of conglomerate, greywacke, arkose and slate with subordinate lenses of marcasite-graphite schist, form an east-west trending belt, crossing most of the northern part of Midlothian township and extending westward into Halliday township. This belt abruptly disappears beneath the overburden west of Campbell Lake and only reappears as small outliers in central Halliday township.

Along the flanks of this belt are thick sequences of older east-west trending metavolcanics, which underlie the remaining part of the area. The metavolcanics on the northern flank include massive, amygdaloidal, breccia and pillowed dacites and andesites, with which are intercalated subordinate rhyolite tuffs and breccias. The metavolcanics on the southern flank consist mainly of rhyolite flows, tuffs, and breccias. Intermediate flows are most prominent in Halliday township, particularly in the northern half where they grade into mafic intrusive rocks.

Intrusive into the metavolcanics is a zone of ultramafic to mafic sill-like bodies. This zone comprises a complex with a dunite and peridotite core and a pyroxenite and gabbro marginal phase. The smaller isolated bodies may show only one or two of these phases.

A very small number of medium- to fine-grained granitic dikes crosscut these older rocks, similarly these older rock units are cut by regular to irregular north-trending Matachewan diabase dikes. There is a very noticeable decrease in their occurrence going westward from Midlothian to Halliday township.

Younger, probably Huronian, conglomerates, quartzites, greywackes and argillites, unconformably overlie the previously described rock units. Younger quartz diabase lenses occur in these sedimentary rocks.

**Structural Geology:** The major structural element is the belt of older metasediments, which occupies the central portion of a large easterly-plunging syncline, whose axis has been displaced by a series of north-south shear zones. The abrupt termination of the metasedimentary belt west of Campbell Lake, may be due to erosion, acting in conjunction with the plunge of the fold, or it may be due to faulting parallel to the Grassy River system. Top determinations on the overturned northern limb of the fold are scarce, while excellent examples of graded bedding and crossbedding are to be found south of Roche Bay on Midlothian Lake.

Strong east-west faults cross Midlothian and Halliday townships. One of the strongest of these crosses a few hundred feet south of Stairs mine, near the contact between the metasediments and metavolcanics. Two other major sets of faulting have northeast and north-northwest strikes. The largest offsets have occurred along these later left-handed north-northwest faults.

**Economic Geology:** The Stairs mine, situated on the southern limb of the syncline, produced gold and silver from 1965 to 1966. The gold-bearing quartz veins occur in two zones of intense shearing and sericitization, each 30-40 feet wide separated by about 125 feet of altered arkose and conglomerate. The quartz veins emanate from a carbonatized fault zone; and strike N50°E. Gold is associated with chalcocite, galena, tetrahedrite, and sphalerite.

On the Laroma Midlothian Mines property, gold occurs in a network of quartz stringers, in a green carbonate zone. Relic textures and unaltered fragments in this zone suggest that it was originally an ultramafic body. Minor pyrite, chalcocite, galena and sphalerite are observable in this zone. According to Marshall (1947, p. 13) the company reported assays of 0.07 oz. gold per ton from core and selected samples; visible gold occurs sparingly on surface showings.

Reports filed for assessment work credit at the Resident Geologist's Office, Kirkland Lake indicate that very restricted but good gold values have been found in northeast Halliday and northern Midlothian townships.

A grab sample from the pit on the south shore of Bray Lake assayed 0.14% nickel.

Asbestos was seen in the ultramafic rocks on the northwestern arm of Lloyd Lake (see also Marshall 1947, p. 21).