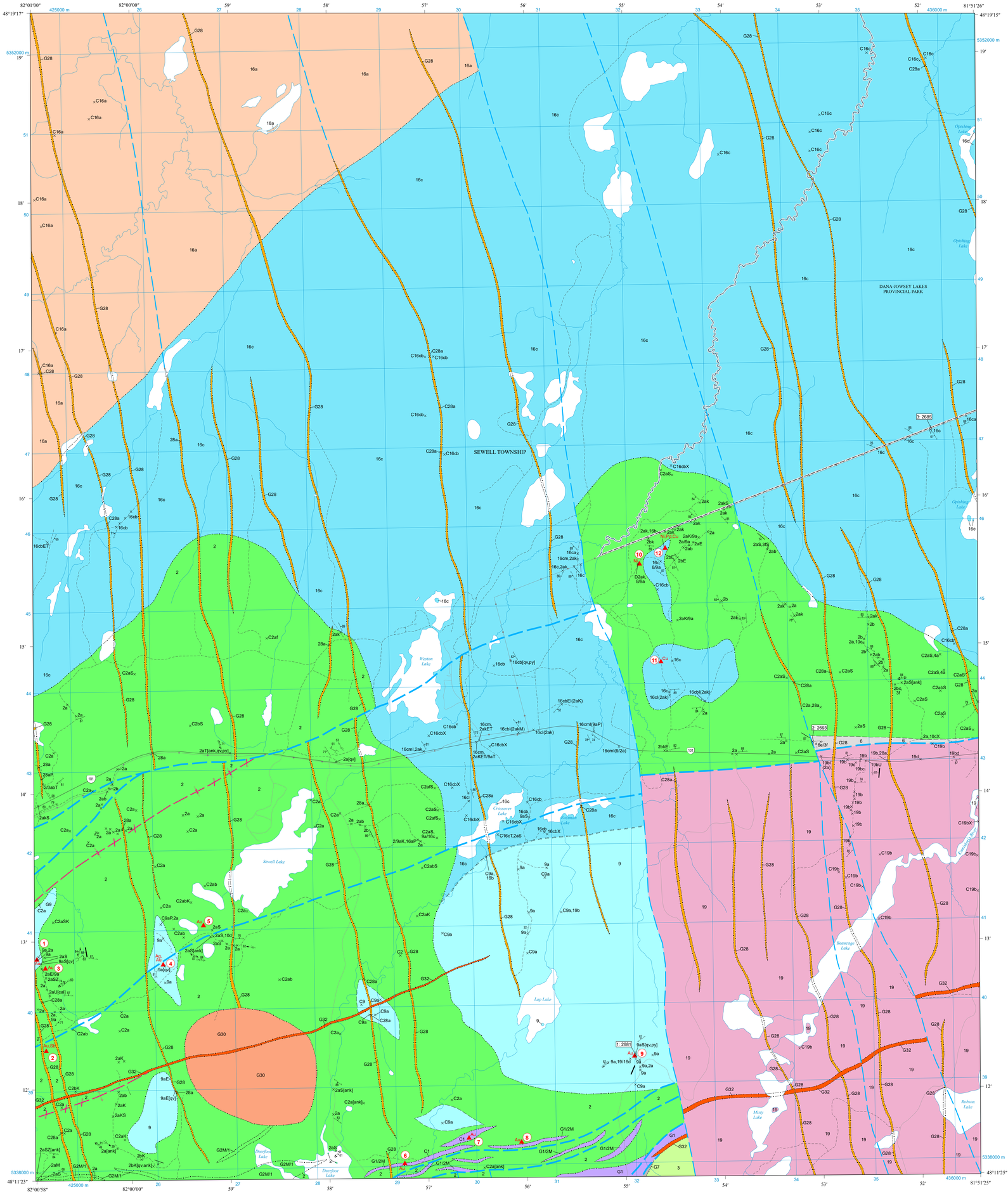

LEGEND[abcdefg]

PHANEROZOIC

CENOZOIC

QUATERNARY

RECENT
Lake, stream and wetland deposits

PLEISTOCENE
Glacial, glaciofluvial and glaciolacustrine deposits: sand, gravel, clay and till

UNCONFORMITY

PRECAMBRIAN

PROTEROZOIC

MESOPROTEROZOIC

Mafic Intrusive Rocks

32 **Abitibi Dike Swarm (east-northeast trending) (*circa* 1140 Ma)[b]**

30 **Unsubdivided Proterozoic Intrusion**

28 **Matachewan Dike Swarm (northwest trending) (*circa* 2460 Ma)[b]**
28a Gabbro

28P Plagioclase phyric, >1% plagioclase phenocrysts

INTRUSIVE CONTACT

ARCHEAN

NEOARCHEAN

Kenogamissi Batholith

19 **Intermediate and Felsic Intrusive Rocks**
19b Granodiorite
19c Quartz diorite or diorite
19d Granite

19I Intrusion breccia
19P Porphyritic
19U Granite dikes: aplite and/or pegmatite
19X Xenolith bearing

Nat River Granitic Complex

16 **Unsubdivided**

16a Tonalite

16b Granodiorite

16c Quartz diorite or diorite

16d Granite
16m Dikes

16E Coarse grained
16I Intrusion breccia
16P Porphyritic
16T Gneissic
16X Xenolith bearing

INTRUSIVE CONTACT

Metamorphosed Mafic, Intermediate and Felsic Intrusive Rocks

10 **Porphyritic Felsic to Intermediate Intrusive Rocks**
10c Feldspar porphyry
10d Tonalite

10X Xenolith bearing

9 **Mafic Intrusive Rocks**
9a Diorite, gabbro

9E Coarse grained
9K Chlorite bearing
9P Porphyritic
9S Schistose
9T Gneissic

8 **Ultramafic Intrusive Rocks**
8a Peridotite

INTRUSIVE CONTACT

Metasedimentary and Metavolcanic Rocks

7 **Chemical Metasedimentary Rocks**

6 **Clastic Metasedimentary Rocks**
6e Siltstone

4 **Felsic to Intermediate Metavolcanic Rocks**
4a Massive flow

3 **Intermediate Metavolcanic Rocks**
3a Massive flow
3b Pillowed flow
3f Tuff

3S Schistose
3T Gneissic

2 **Mafic Metavolcanic Rocks**
2a Massive flow
2b Pillowed flow
2c Pillowed breccia
2f Tuff
2k Amphibolite

2E Coarse-grained flow
2K Chlorite bearing
2M High magnetic susceptibility
2S Schistose
2T Gneissic
2U Amygdaloidal and/or vesicular
2Z Silicified and/or sericitized

1 **Ultramafic Metavolcanic Rocks**

[a] *This legend is based only on field investigations and is subject to change based on geochronological or geochemical data. All Precambrian rocks have been subjected to regional metamorphism; many nonmetamorphic terms are used for the sake of brevity and where the protolith is established.*

[b] *The letter "C" preceding a code refers to data compiled from previous geological maps listed under "Sources of Information".*

[c] *The letter "G" preceding a code refers to data interpreted from aeromagnetic geophysical surveys listed under "Sources of Information".*

[d] *The letter "D" preceding a code data interpreted from diamond-drill holes. The first code represents the lithology at the surface and the following code(s) represent lithology sampled at depth.*

[e] *Rock codes designated with a "/" (e.g., 2/9ak) indicate that the observed outcrop displays characteristics that could belong to either rock type, but the first code is inferred by the authors to be predominant.*

[f] *Rock codes within parentheses "()" following an "I" describe the type(s) of rock fragments within the intrusion breccia.*

[g] *The legend used in this map correlates with legends used in the Swayze area of the Abitibi greenstone belt in Ontario Geological Survey maps P.3817 (Gemmell and MacDonald 2017), P.3819 (MacDonald, Bisaillon and Gemmell 2018), P.3827 (Gemmell, Szumylo and Mowbray 2019), P.3841 (Vice and MacDonald 2019), P.3842 (MacDonald, Vice and Bisaillon 2020) and P.3847 (Vice and MacDonald 2021)*

[h] *Names of Proterozoic dike swarms are based on Osmani (1991) and ages are based on Bleeker et al. (2015; Matachewan) and Krough et al. (1987; Abitibi).*

SYMBOLS

- Outcrop
- Geological contact, trend only (interpreted)
- Geological contact, gradational, trend only (interpreted)
- Geological contact, based on interpretation of geophysical data, trend only (interpreted)
- Fold, antiform, unknown generation, trend only (interpreted)
- Fold, synform, unknown generation, trend only (interpreted)
- Fault, ductile dominated, trend only (interpreted)
- Fault, brittle dominated, trend only (interpreted)
- Brittle-ductile fault; unknown generation, unknown displacement (inclined)
- Bedding; pillows, facing direction known (trend only, inclined)
- Bedding; pillows, facing direction not known (inclined)
- Bedding; volcanic structures other than flow tops and pillows, facing direction not known (inclined)
- Cleavage; crenulation, Z-asymmetry, unknown generation, (inclined)
- Cleavage; crenulation, unknown asymmetry, 2nd generation, (inclined)
- Compositional layering; gneissic (inclined)
- Foliation; unknown generation (trend only, inclined)
- Foliation; 1st generation (inclined)
- Fracture; unknown generation, unknown vertical displacement (inclined)
- Igneous contact; unsubdivided (trend only)
- Igneous contact; dike (inclined)
- Lineation; elongation (stretch), unknown generation
- Lineation; fold axis, S-asymmetry, unknown generation
- Lineation; crenulation, M-asymmetry, unknown generation
- Lineation; crenulation, Z-asymmetry, unknown generation
- Shear (ductile); unknown horizontal displacement, unknown generation (inclined)
- Shear (ductile); dextral displacement, unknown generation (inclined)
- Shear (ductile); sinistral displacement, unknown generation (inclined)
- Vein; shear, unknown generation (inclined)
- Glacial stria (direction known)
- Mineral occurrence, with commodity (number corresponds with "Occurrences" table)
- Geochronology sample location with ages in Ma (first number corresponds with Table 1)
- Utility line
- Highway, road
- Trail
- Provincial Park

ABBREVIATIONS[ab]

Ag ..... silver
ank ..... ankerite
Au ..... gold
cal ..... calcite
Cu ..... copper
Ni ..... nickel
Pd ..... palladium
py ..... pyrite
qv ..... quartz vein(s)
Sb ..... antimony

[a] *Red (MDI) abbreviation indicates mineralization; black (map station) abbreviation indicates observed mineralogy.*

[b] *Square brackets are used to indicate the presence of minerals that represent significant veining, mineralization, alteration phases and/or distinct metamorphic assemblages. For example, code 2a[ank] indicates a massive basalt flow with ankerite alteration; code 2al/[cal] indicates an amygdaloidal massive basalt flow with calcite alteration; or code 9a3[py,py] indicates a schistose diorite or gabbro with quartz vein(s) and pyrite.*

Ontario

Ontario Geological Survey

MAP P.3848

PRECAMBRIAN GEOLOGY

SEWELL TOWNSHIP NORTHERN SWAYZE AREA ABITIBI GREENSTONE BELT

NORTHEASTERN ONTARIO

Scale 1:20 000

500 m 0 0.5 1 km

NTS References: 42 A/4, 5; B/1, 8

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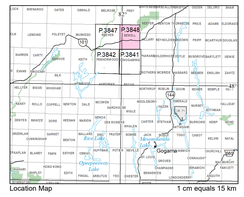

1 cm equals 15 km

SOURCES OF INFORMATION

Digital base map information derived from the Land Information Ontario Data Warehouse, Land Information Ontario, Ministry of Natural Resources and Forestry, scale 1:50 000, with modifications by staff of the Ministry of Energy, Northern Development and Mines.

Mapping conducted using Universal Transverse Mercator (UTM) co-ordinates in North American Datum 1983 (NAD83), Zone 17.

Geophysical data from:

Ontario Geological Survey 2003. Ontario airborne geophysical surveys, magnetic and electromagnetic, grid and profile data (ASCII format), North Swayze–Montcalm area; Ontario Geological Survey, Geophysical Data Set 1005.

GFG Resources Inc. 2018. GFG geophysical survey outlines prospective corridors at the Pen Gold Project west of Timmins, Ontario; press release, May 24, 2018.

GFG Resources Inc. 2020. GFG returns multiple zones of high-grade gold mineralization at the HGM Target, Pen Gold Project west of Timmins, Ontario; press release, January 8, 2020.

Compiled geology and mineral deposit data derived from:

Assessment files, Resident Geologist's office, Timmins.

Ayer, J.A. 1995. Precambrian geology, northern Swayze greenstone belt; Ontario Geological Survey, Map 2627, scale 1:50 000.

Heather, K.B. 2001. The geological evolution of the Archean Swayze greenstone belt, Superior Province, Canada; unpublished PhD thesis, Keele University, Keele, Staffordshire, United Kingdom, 370p.

Milne, V.G. 1972. Geology of the Kukatush–Sewell Lake area, District of Sudbury; Ontario Division of Mines, Geological Report 97, 116p.

Ontario Geological Survey 2021. Mineral Deposit Inventory; Ontario Geological Survey, Mineral Deposit Inventory, (January 2021 update), online database.

Geochronology data from:

Bleeker, W., Kamo, S.L., Ames, D.E. and Davis, D.W. 2015. New field observations and U-Pb ages in the Sudbury area: Toward a detailed cross-section through the deformed Sudbury Structure; *in* Targeted Geoscience Initiative 4: Canadian Nickel-Cooper-Platinum Group Elements-Chromium Ore Systems – Fertility, Pathfinders, New and Revised Models, Geological Survey of Canada, Open File 7856, P.151-156.

Krogh, T.E., Corfu, F., Davis, D.W., Dunning, G.R., Heaman, L.M., Kamo, S.L., Machado, N., Greenough, J.D. and Nakamura, E. 1987. Precise U-Pb isotopic ages of diabase dikes and mafic to ultramafic rocks using trace amounts of baddeleyite and zircon; *in* Mafic Dike Swarms, Geological Association of Canada, Special Paper 34, p.147-152.

Osmani, I.A. 1991. Proterozoic mafic dike swarms in the Superior Province of Ontario; *in* Geology of Ontario, Ontario Geological Survey, Special Volume 4, Part 1, p.661-681.

Sutcliffe, C.N. 2020. U-Pb geochronology report for samples from northern Ontario by LA–ICPMS. Year 5: 2019–2020; internal report for the Ontario Geological Survey, Jack Satterly Geochronology Laboratory, University of Toronto, Toronto, Ontario, 72p.

Sutcliffe, C.N. and Davis, D.W. 2019. Part B: U–Pb geochronology by LA-ICPMS for samples from northern Ontario. Year 4: 2018–2019; Internal report for the Ontario Geological Survey, Jack Satterly Geochronology Laboratory, University of Toronto, Toronto, Ontario,146p.

Other:

Gemmell, T.P. and MacDonald, P.J. 2017. Precambrian geology of the Yeo and Chester townships area, Chester intrusive complex, southern Abitibi greenstone belt; Ontario Geological Survey, Preliminary Map P.3817, scale 1:20 000.

Gemmell, T.P., Szumylo, N. and Mowbray, A.B. 2019. Precambrian geology of Marion and Mallard townships and part of Genoa Township, southeastern Swayze area, Abitibi greenstone belt, northeastern Ontario; Ontario Geological Survey, Preliminary Map P.3827, scale 1:20 000.

MacDonald, P.J., Bisaillon, J.M. and Gemmell, T.P. 2018. Precambrian geology of the Oaway and Huffman townships area, Opeepeesway basin, southern Abitibi greenstone belt; Ontario Geological Survey, Preliminary Map P.3819, scale 1:20 000.

MacDonald, P.J., Vice, L.E.D. and Bisaillon, J.M. 2020. Precambrian geology of Penhorwood Township, northern Swayze area, Abitibi greenstone belt, northeastern Ontario; Ontario Geological Survey, Preliminary Map P.3842, scale 1:20 000.

Vice, L.E.D. and MacDonald, P.J. 2019. Precambrian geology of Kenogamiing Township, northern Swayze area, Abitibi greenstone belt, northeastern Ontario; Ontario Geological Survey, Preliminary Map P.3841, scale 1:20 000.

Vice, L.E.D. and MacDonald, P.J. 2021. Precambrian geology of Reeves Township, northern Swayze area, Abitibi greenstone belt, northeastern Ontario; Ontario Geological Survey, Preliminary Map P.3847, scale 1:20 000.

Geology not tied to surveyed lines.

Magnetic declination for centre of map area approximately 9°53.78'W in January 2021, with an annual change of 1.4'/y east, and was calculated using the International Geomagnetic Reference Field (IGRF–12, version May 2015).

Metric conversion factor 1 foot = 0.3048 m

CREDITS

Geological mapping and interpretation by L.E.D. Vice and P.J. MacDonald during the summers of 2018 and 2019, with assistance from Justin Bisaillon, Sarah Bowie, Sarah McLeod, Trevor Watkins, Jack Mehltretter, Bailey Miles, Nick Eyre, Kyle Dzurban and Emily Archibald.

This map is part of a multiyear, 1:20 000 scale bedrock mapping project of the northern Swayze area.

Preparation of geophysical imagery by D.R.B. Rainsford.

Preparation of base map by S.A. Evers.

Digital drafting by L.E.D. Vice and S.A. Evers.

Cartographic production by J. Rickards.

Scientific review by S. Prefontaine.

Corresponding and additional digital data related to the information portrayed on the map are available from the following Ontario Geological Survey publication:

Vice, L.E.D. and MacDonald, P.J. 2021. Geological, geochemical and geophysical data related to Reeves and Sewell townships, northern Swayze area, Abitibi greenstone belt, northeastern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 393.

Every possible effort has been made to ensure the accuracy of the information presented on this map; however, the Ontario Ministry of Energy, Northern Development and Mines does not assume liability for errors that may occur. Users should verify critical information.

Issued 2021.

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:

Vice, L.E.D. and MacDonald, P.J. 2021. Precambrian geology of Sewell Township, northern Swayze area, Abitibi greenstone belt, northeastern Ontario; Ontario Geological Survey, Preliminary Map P.3848, scale 1:20 000.

Users of OGS products should be aware that Indigenous communities may have Aboriginal or treaty rights or other interests that overlap with areas of mineral potential and exploration.

Table 1. Geochronological results for samples from Sewell Township.

Number[a]	Sample ID	Mineral and Method[b]	Age (Ma)			Interpretation	Rock Type	Easting[c] (m)	Northing[c] (m)	Source
			Youngest	Preferred	Inherited					
1	19LV070	Zircon U/Pb LA-ICP-MS		2681±2	2703±2	Emplacement[d]. Bimodal distribution of ages (intrusion emplacement and inheritance).	Medium- to coarse-grained gabbro to diorite with secondary chlorite	432011	5339338	this study; Sutcliffe (2020)
2	18PM106	Zircon U/Pb LA-ICP-MS	<2671±20	<2693±6		Deposition: Inconclusive statistical age[d], minimum date from interpreted youngest concordant zircon at 2671 Ma, preferred weighted mean maximum depositional age from 23 analyses at 2693±6 Ma MSWD = 1.4, probability = 0.11.	Interflow greywacke in volcanic package	434291	5343240	this study; Sutcliffe and Davis (2019)
3	19LV069	Zircon U/Pb LA-ICP-MS		2685±2	2707±2	Emplacement[d]. Bimodal distribution of ages (intrusion emplacement and inheritance).	Medium- to coarse-grained diorite	435834	5347125	this study; Sutcliffe (2020)

[a] *"Number" indicates the sample location on the map face.*

[b] *Abbreviations: U/Pb = uranium–lead; LA-ICP-MS = laser ablation inductively coupled plasma mass spectrometry; MSWD = mean square weighted deviation*

[c] *Locations provided as UTM co-ordinates in NAD83, Zone 17.*

[d] *Statistical age determined in Sutcliffe and Davis (2019) and Sutcliffe (2020).*

OCCURRENCES[ab]

Number[c]	Occurrence and MDI Number	Classification	Commodity	Best Historical Value[d]	Host Rock	Easting (m)	Northing (m)
1	Amador Gold Corp. DDH P-08-04 MDI0000000001925	Occurrence	Au	0.5 m @ 2.08 g/t Au (DDH)	Fuchsite-altered sheared mafic metavolcanic rocks (py)	424524	5340667
2	Card Lake Copper Property MDI42B01NE00021	Occurrence	Au, Sb	0.7 g/t Au, 14.2% Sb (grab sample)	Sheared sericite-altered metabasalt (sb, apy, po, py)	424624	5339521
3	Winross Gold Property MDI42B01NE00022	Occurrence	Au	6.2 g/t Au (grab sample)	Quartz vein within sheared chlorite- and ankerite-altered metabasalt	424629	5340555
4	Tremblay Option MDI42A04NW00033	Occurrence	Ag, Au	23.31 g/t Ag and 4.7 g/t Au (grab samples)	Quartz stockwork in strongly carbonate-altered rocks near mafic to intermediate intrusive and metavolcanic rocks (py)	426106	5340581
5	R. Tremblay Property MDI42A04NW00048	Occurrence	Au	1.1 m @ 94.02 g/t Au (DDH)	Albite- and sericite-altered metabasalt (py, apy)	426619	5341065
6	Noranda DDH DF93-9 MDI42A04NW00054	Occurrence	Au	0.5 m @ 2.45 g/t Au (DDH)	Mafic metavolcanic rocks intruded by porphyry (py)	429096	5338043
7	Hemlo Gold Mines DDH DF94-18 MDI0000000001928	Occurrence	Au	1.50 m @ 43.44 g/t Au (DDH)	Silicified ultramafic to mafic metavolcanic rocks with sulphide aggregate, veinlets and disseminations (py, cp, sp)	429906	5338350
8	Hemlo Gold Mines DDH DF95-26 MDI0000000001926	Occurrence	Au	1.20 m @ 1.19 g/t Au (DDH)	Magnetic silicified mafic metavolcanic rocks (py, apy)	430564	5338288
9	Mining Corporation Property MDI42A04NW00009	Prospect	Au	175.3 g/t Au (grab sample)	Thick and satellite quartz veins within sheared hornblende diorite to gabbro (py, cp)	431996	5339346
10	McIntyre Johnson MDI42A05SW00016	Occurrence	Ni	1.3 m @ 0.2% Ni (DDH)	Differentiated peridotite and gabbro (mi)	432157	5345508
11	McIntyre Showing MDI42A04NW00053	Occurrence	Cu	0.35 % Cu (grab sample)	Gabbro (py, cp)	432407	5344278
12	Cross Lake 2-96 Property MDI42A05SW00017	Occurrence	Ni, Pd, Cu	1.99% Ni, 1.096 g/t Pd, 0.35% Cu (channel sample)	Serpentinized graphitic peridotite (po, pn, cp)	432482	5345703

[a] *Data compiled from Ontario Geological Survey (2021); "Classification" as designated in MDI. Locations provided as UTM co-ordinates in NAD83, Zone 17; however, discrepancies may occur in the location of MDI points. Users should verify critical locations.*

[b] *Abbreviations: Ag, silver; apy, arsenopyrite; Au, gold; cp, chalcopyrite; Cu, copper; DDH, diamond-drill hole; g/t, grams per tonne; m, metre; ml, millerite; Ni, nickel; Pd, palladium; %, weight percent; pn, pentlandite; po, pyrrhotite; py, pyrite; Sb, antimony; sp, sphalerite; sb, stibnite.*

[c] *"Number" indicates the occurrence location on the map face.*

[d] *Historical values reflect the best mineralogical grade presented in MDI (Ontario Geological Survey 2021).*