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ONTARIO GEOLOGICAL SURVEY
 MAP P. 2587
 GEOLOGICAL SERIES-PRELIMINARY MAP
 QUATERNARY GEOLOGY
SYDENHAM AREA
 SOUTHERN ONTARIO

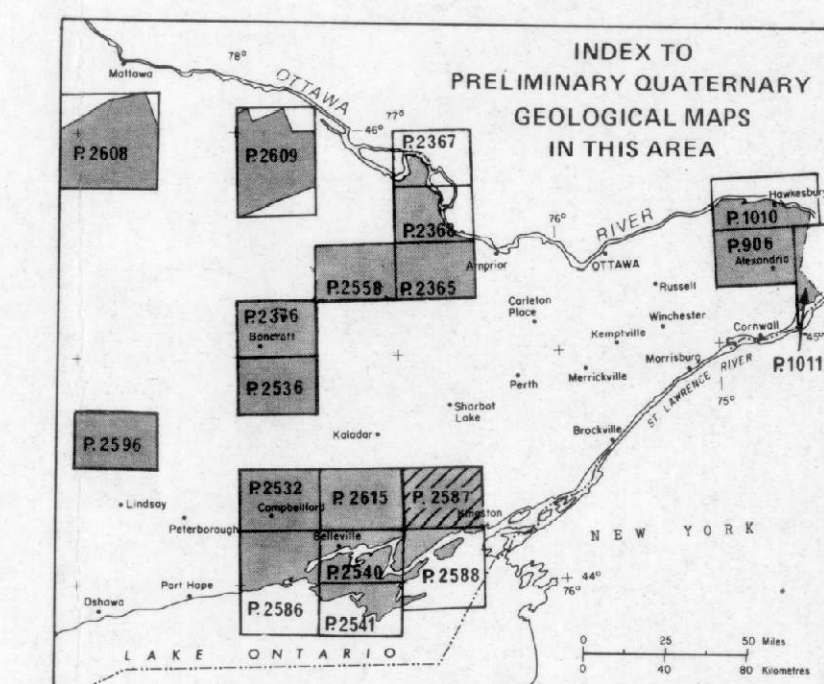
Scale 1:50 000
 Mile 1
 Metres 1000
 Kilometre 1

NTS Reference: 31 C/7
 ODM-GSC Aeromagnetic Map: B392G
 OGS Geological Compilation Map: 2418

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LEGEND

PHANEROZOIC	
CENOZOIC	
QUATERNARY	
RECENT	
15	Man-made deposits*, predominantly fill
14	Modern shoreline deposits* 14a beach deposits; sand, gravel 14b windblown deposits; sand, silt
13	Modern alluvium; unsorted sand, silt, gravel, clay, muck
12	Organic deposits; peat, muck
PLEISTOCENE	
11	Older fluvial deposits; gravel, gravely sand, sand
10	Windblown (eolian) deposits; sand, silt
9	Glaciolacustrine shoreline deposits* 9a beach, bar, etc.; sand, gravel 9b wave planed deposits; lag gravels, sand, silt
8	Glaciolacustrine shallow water deposits; massive to laminated or bedded sand, silt
7	Glaciolacustrine deeper water deposits; massive to varved or laminated silt, clay
6	Glaciolacustrine outwash deposits; 6a proximal sand, gravely sand, gravel 6b distal sand, gravely sand
5	Glaciolacustrine ice-contact deposits; gravel, gravely sand, minor silt and till
4	Till; very stony, variable matrix
3	Till; silty to sandy, moderately stony
UNCONFORMITY	
PALEOZOIC	
MIDDLE ORDOVICIAN	
2	Bedrock; exposed or with less than 1 m of drift cover
UNCONFORMITY	
PRECAMBRIAN	
1	Bedrock; exposed or with less than 1 m of drift cover

*Units not present in this map area

SOURCES OF INFORMATION

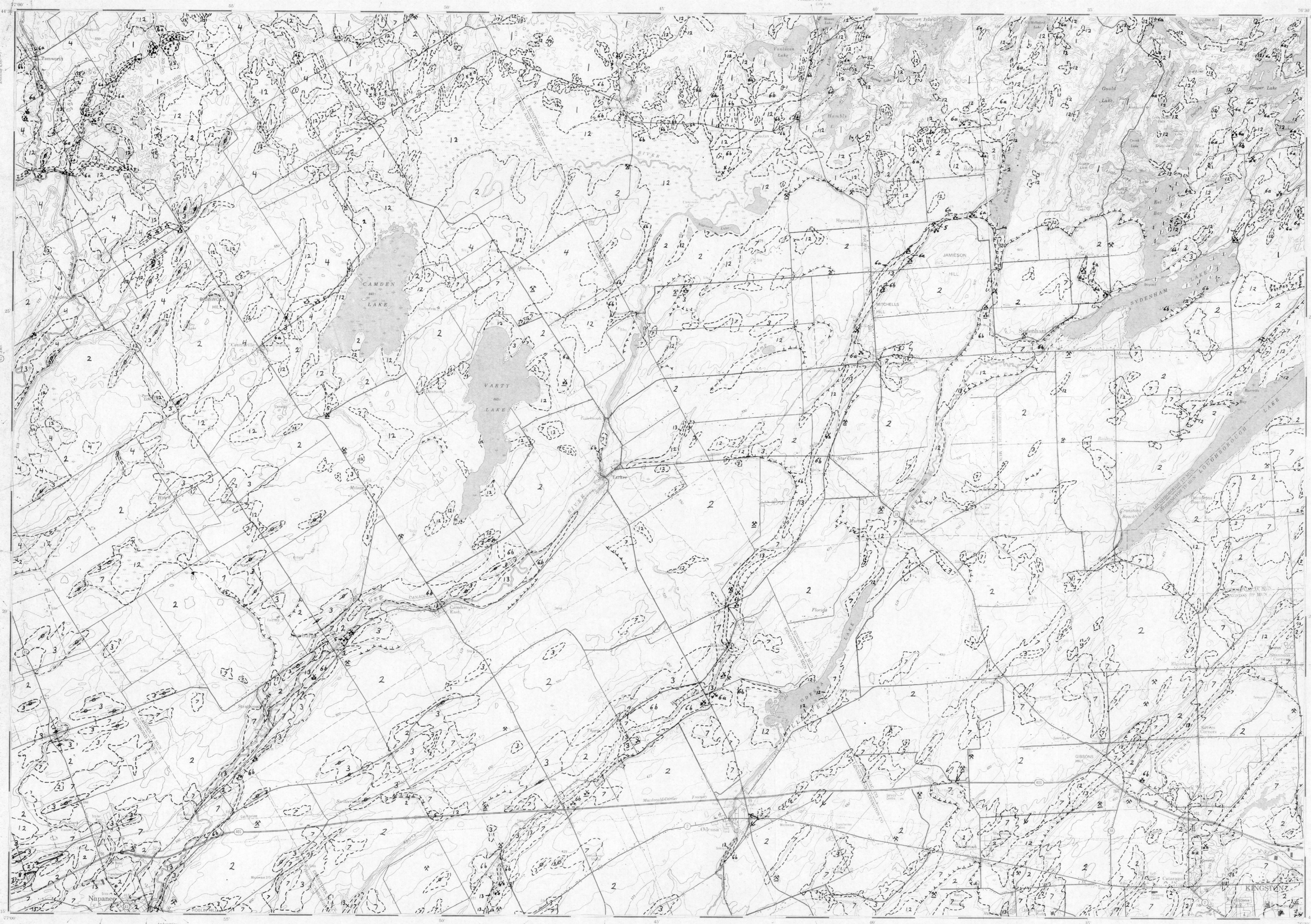
Base map from Map 31 C/7 of the National Topographic Series. Aerial Photographs, Ontario Ministry of Natural Resources, Toronto and National Airphoto Library, Ottawa. Additional information from water well records, Ontario Ministry of the Environment. Magnetic declination approximately 11°23'W in 1982. Metric Conversion Factor: 1 foot = 0.3048 m

CREDITS

Geology by J.G. Leyland, T.S. Russell, and assistants, 1982. Every possible effort has been made to ensure the accuracy of the information presented on this map; however, the Ontario Ministry of Natural Resources does not assume any liability for errors that may occur. Users may wish to verify critical information; sources include both the references listed here, and information on file at the Resident or Regional Geologist's office and the Mining Recorder's office nearest the map area.

This project is part of the Southern Ontario Geological Survey (SOGS) which was funded jointly by the Federal Department of Regional and Economic Expansion and the Ontario Ministry of Natural Resources under the Minerals Program of the Eastern Ontario Subsidiary Agreement.

Issued 1984. Information from this publication may be quoted if credit is given. It is recommended that reference be made in the following form: Leyland, J.G., and Russell, T.S., 1984. Quaternary Geology of the Sydenham Area, Southern Ontario, Ontario Geological Survey, Map P. 2587, Geological Series-Preliminary Map, scale 1:50 000, Geology 1982.



MARGINAL NOTES

INTRODUCTION
 Quaternary geology mapping in the Sydenham area was carried out by the authors in the summer of 1982 assisted by R.A. Roy and A.M. Steinhilber. This area was previously included in a regional physiographic study by Chapman and Putnam (1951, 1956) and by Myrnesch from 1955 to 1962 (1978). The purpose of the present mapping is to update previous studies and provide a more up-to-date database consistent with similar studies being carried out in Ontario. Field techniques included the use of soil probes and hand augers, and the examination of natural and man-made exposures. Air photographs were used extensively in conjunction with field checking. Detailed results of this mapping will be included in a geological report covering this and 8 surrounding map areas (Bath (31 C/2), Yorkshire Island (30 N/3), Tweed (31 C/8), Belleville (31 C/9), Wellington (30 N/4), Campbellford (31 C/6), Trenton (31 C/14), and Concession (30 N/13), map sheets).

BEDROCK GEOLOGY

Precambrian metasediments and metavolcanics of the Grenville Province (unit 1) are exposed across most of the extreme northern portion of the map area. Paleozoic bedrock (unit 2) is exposed at the surface or underlies Quaternary deposits throughout the remainder of the area. Of the 5 Paleozoic formations occurring in this area the Middle Ordovician, Gull River Formation is the most extensive. The Gull River Formation is composed of lithographic and sublitographic limestone, siltstone, dolomitic limestone, crystalline limestone, and lithographic to finely crystalline limestone (Carson 1951, Liberty 1971). The Bobcaygeon Formation, exposed through a large part of the southwestern corner of the map area, is composed of crystalline and bioclastic limestone and calcarenite. The bedrock has been strongly modified by glacial erosion resulting in a smooth, often grooved, bedrock surface. Several escarpments are present in this area. These rock scarps have been strongly modified by glacial erosion.

QUATERNARY GEOLOGY

Glacial Deposits
 Glacial deposits in the Sydenham area are of Late Wisconsinan age. The

action of the glacial ice was mainly erosional in this area and as a consequence very little glacial sediment was deposited. Till and ice contact sands and gravels are the main types of glacial sediments present. Drumlins, orientation, bedrock striations, and grooves show a main ice movement to the southwest. Cross-cutting striae at Odessa are evidence of a weak, late ice-advance out of the Lake Ontario basin from the east-southeast. No glacial sediments related to this last glacial event are present in this area but are found to the west in the Wellington map area.

Till
 Two till types are present in the Sydenham map area. A silty-sand to sandy-silt till (unit 3) occurs as a patchy drumlized till plain mainly in the western half of the map area. The second till (unit 4) is a very stony, generally clay supported till, with a variable (but usually sandy) matrix, found within the northwestern portion of the map area. This latter material exhibits a very unique hummocky topography that was previously referred to as the "Dummer Moraines" by Chapman and Putnam (1951, 1956). The coarse fraction of this deposit is composed almost exclusively of local angular to subangular Paleozoic rock fragments. It is occasionally observed to grade into poorly sorted sandy gravels, probably indicating that the deposit has been washed by glacial meltwater. These characteristics together with the generally very hummocky nature of the deposit suggest that this till melted out of the ice as englacial material.

Glacioluvial Deposits

Glacioluvial ice contact deposits (unit 5) occur as esker ridges in the Tanworth area. Small deposits of outwash (units 6a and 6b) are associated with these deposits. Throughout the remainder of the area subglacial and proglacial streams followed natural bedrock depressions and valleys. This resulted in the partial or total infilling of some of these low bedrock depressions with ice contact and outwash sands and gravels. Subsequent erosion by modern streams has left remnants of these deposits along valley walls.

Glaciolacustrine Deposits

Massive glaciolacustrine silts and clays (unit 7) occur sporadically throughout the map area. These fine grained deposits are generally on the order of 1 m in thickness. In deeper bedrock depressions, the thickness may increase to several metres. One deposit of nearshore silts and sands (unit 8) occurs 2 km west of Napanee in association with a raised strandline.

Post Glacial Deposits

Bog and swamp deposits (unit 12) are common throughout the map area. A large deposit of up to several metres thickness occurs along the Precambrian Paleozoic boundary. Modern alluvium (unit 13) is present in the major river and stream channels of the area. Development of modern alluvium is restricted by the proximity of the bedrock valley walls.

ECONOMIC GEOLOGY

Outwash deposits contain potential aggregate resources, much of which have already been exploited. Many of these deposits are, however, composed mainly of sand, making them of limited economic use. Esker and other ice contact deposits contain coarse material making them economically more desirable. Numerous small quarries occur through the map area. Several of these quarries are still used for the production of crushed stone.

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SYMBOLS

- Glacial striae; direction of ice movement known or assumed
- Drumlin or drumlinoid ridge
- Esker
- Abandoned beach ridges or nearshore bar
- Geological boundary; approximate
- Bedrock escarpment
- Small Precambrian outcrop
- Small Paleozoic outcrop
- Sand or gravel pit; active, abandoned
- Quarry; active, abandoned