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Marginal Notes

The Far North Act encourages economic development in Northern Ontario and collaboration between Ontario and First Nations on land use planning. The need for primary landscape data was identified early in the planning stages of the Act, and a terrain mapping project to map surficial materials was initiated by the Ontario Geological Survey to address this data gap. The current surficial geology Far North map publications support the Far North Act and associated land use planning initiatives.

The primary data sources for the terrain mapping project are Sentinel-2 satellite imagery, Ontario Radar Digital Surface Model (Ontario Ministry of Natural Resources and Forestry 2015) and its derivatives, the Ontario Hydro Network (Ontario Ministry of Natural Resources and Forestry 2020) and previous field data and maps. An object-based image analysis software is used in this mapping exercise. The software uses the power of data fusion and method integration to extract feature information. Data fusion combines raster and vector data to identify features based on the information in the spatial data. Method integration allows for the combination of various data analyses, e.g., supervised classification, unsupervised classification, and knowledge-based and machine learning, to identify features based on specific rules. For these maps, a multiresolution segmentation algorithm (eCognition algorithm), using different image layer weights, scale parameters and homogeneity criterion within the software, is used to identify meaningful features representing various surficial material types. The features are then classified based on digital signature, internal variability of signature and the relationship to adjacent features.

Limited helicopter-supported field work, in addition to archival information available for this region and the Far North at large, provided the ground control on the classification of objects (Sanford, Norris and Bostock 1968; Skinner 1973; Sanford and Norris 1975; EBA Engineering Consultants Limited 1976, 1977; Harvey 1979; Ontario Ministry of Natural Resources 1993; Thorleifson, Wyatt and Warman 1993 and their unpublished field notes; Gao, Yeung and Szumylo 2017; Gao et al. 2018; Geological Survey of Canada, Operation Winisk unpublished field notes; and Riley and Boissonneau unpublished field notes and photographs). Information from the various other Far North Information and Knowledge Management Program projects, such as base data and land cover information (Ontario Ministry of Natural Resources and Forestry 2014), has been used in the interpretation and classification of the surficial materials. The maps show only the surface material distribution. For better definition of wetland types, please see Ontario Ministry of Natural Resources and Forestry (2014). Older Quaternary sediments frequently occur beneath the surface material, as revealed along deeply incised river valleys. However, they are only depicted on the map where their scale is suitable for cartographic presentation.

This project is funded by the Ontario Ministry of Mines. Interaction with the First Nation community members greatly enhanced the map products of the Far North Information and Knowledge Management Program Terrain Mapping Project.

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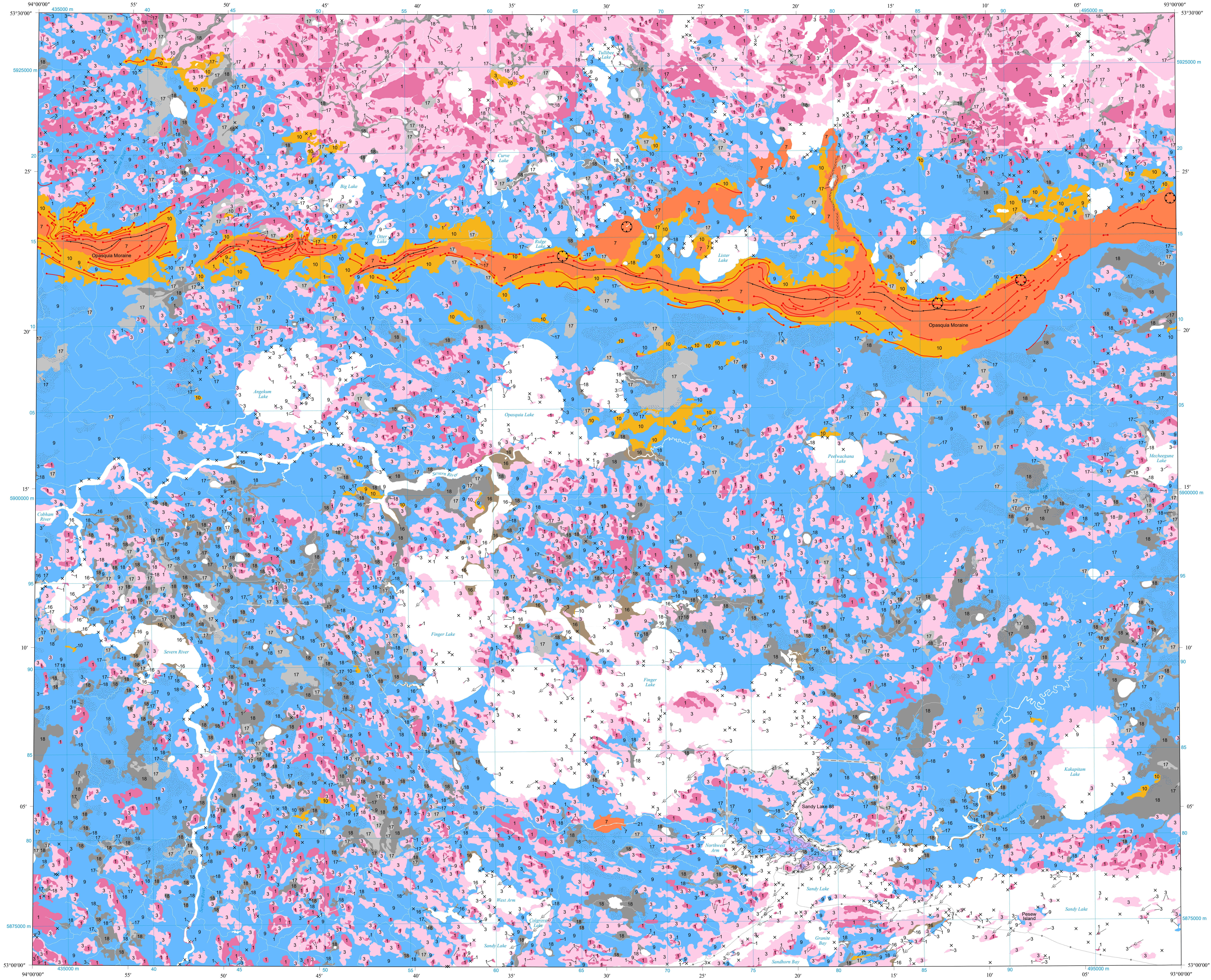

LEGEND[a]

PHANEROZOIC

CENOZOIC

QUATERNARY

21	**Anthropogenic Deposits:** Mine tailings, waste rock piles and other man-made features.
20	**Marine Mud-Flat Deposits:** Sand, silt and clay; deposited in mud flats and offshore bars within the tidal zone.
19	**Marine Salt-Marsh Deposits:** Silt and clay with organic matter, minor sand; deposited in salt marshes along present-day coast.
18	**Organic Deposits:** Peat, muck and/or marl; deposited in fen wetlands.[b]
17	**Organic Deposits:** Peat, muck and/or marl; deposited in bog wetlands.[b]
16	**Fluvial Deposits (recent):** Stratified sand and gravel; may include silt, minor clay. Deposited in bars and channels of present-day rivers and creeks.
15	**Fluvial Deposits (abandoned):** Stratified sand and gravel; may include silt, minor clay. Deposited in bars and channels along abandoned terraces of rivers and creeks.
14	**Marine Deltaic Deposits:** Stratified sand and gravel; silt, minor clay. Deposited at the mouths of rivers and creeks entering a postglacial sea.
13	**Marine Beach and Nearshore Deposits:** Stratified sand and gravel; minor silt. Deposited primarily in the shore zone and nearshore zone of a postglacial sea.
12	**Marine Basin Deposits:** Massive to stratified silt and clay; minor sand. Deposited in basinal areas of a postglacial sea.
11	**Glaciolacustrine Deltaic Deposits:** Stratified sand and gravel; may include minor silt and clay. Deposited at the mouths of rivers and creeks entering a proglacial lake.
10	**Glaciolacustrine Beach and Nearshore Deposits:** Stratified sand and gravel; minor silt. Deposited primarily in the shore zone and nearshore zone of a proglacial lake.
9	**Glaciolacustrine Basin Deposits:** Stratified silt and clay; minor sand. Deposited in basinal areas of a proglacial lake.
8	**Glaciofluvial Outwash Deposits:** Stratified sand and gravel; including minor silt, clay. Deposited in bars and channels in rivers flowing from a glacier.
7	**Glaciofluvial Ice-Contact Deposits:** Stratified sand and gravel; including minor silt, clay, till and flowtill. Deposited in eskers, kames, deltas and subaqueous fans and in end and recessional moraines along a glacier margin.
6	**Till:** Massive to bedded diamicton; clayey silt to clay matrix, clast content low to moderate, may contain discontinuous layers or lenses of stratified gravel, sand, silt and/or clay; includes flowtills. Deposited at the base or along the margins of a glacier.
5	**Till:** Massive to bedded diamicton; sandy silt to silt matrix (clay texture locally), clast content moderate to high, rare discontinuous layers or lenses of stratified gravel, sand, silt and/or clay, or flowtills. Deposited at the base or along the margins of a glacier.
4	**Till:** Massive to bedded diamicton; silty sand to sand matrix, clast content moderate to high, rare discontinuous layers or lenses of stratified gravel, sand, silt and/or clay, or flowtills. Deposited at the base or along the margins of a glacier.
3	**Thin Sediment over Bedrock:** Thin, near-continuous cover of Quaternary sediments overlying undifferentiated bedrock. Quaternary sediments are commonly less than 1 m thick; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.

PALEOZOIC, MESOZOIC AND CENOZOIC (TERTIARY)

2	**Bedrock:** Undifferentiated bedrock with a thin, discontinuous cover of Quaternary sediments. Quaternary sediments rarely exceed 0.5 m in thickness; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.

PRECAMBRIAN

1	**Bedrock:** Undifferentiated bedrock with a thin, discontinuous cover of Quaternary sediments. Quaternary sediments rarely exceed 0.5 m in thickness; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.

[a] *The map legend applies to Preliminary Maps P.3625 to P.3758, and P.3767. Deposits on this sheet are mapped primarily where they reach 1 m or more in thickness. Thinner deposits are not generally shown. All legend units or deposit types may not be present on this map.*

[b] *Refer to Ontario Ministry of Natural Resources and Forestry (2014) for better definition of wetland types and distribution.*

SOURCES OF INFORMATION

The digital base map is 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 Mines. The digital base data is current to January 2021. The map co-ordinates are in UTM Zone 15, North American Datum 1983 (NAD83).

Magnetic declination at the centre of the map area was approximately 0°47′W in 2024 and was calculated using the International Geomagnetic Reference Field (IGRF-13, version December 2019).

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Ontario

Ontario Geological Survey

MAP P.3677

SURFICIAL GEOLOGY

OPASQUIA LAKE AREA SOUTHWEST

NORTHERN ONTARIO

Scale 1:100 000

2000 m 0 2 4 km

NTS References: 53 F/3, 4, 5, 6

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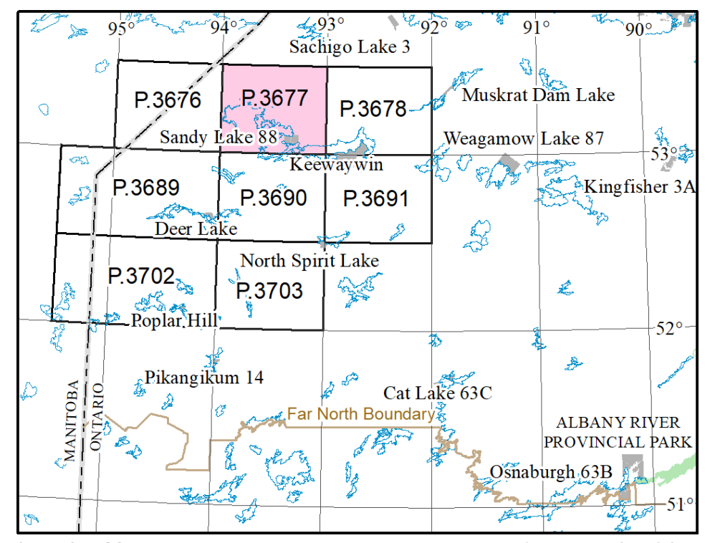

Location Map

1 cm equals 50 km

SYMBOLS[a]

- × Bedrock outcrop (Precambrian)[b]
- Extent of mapping
- Lineament observed on remotely sensed imagery
- Brow of large landslide or failure scar
- Base of terraced escarpment (abandoned glaciolacustrine or marine shorebluff)
- Base of terraced escarpment (margin of abandoned or modern, fluvial or glaciofluvial terrace)
- Trend or crest of abandoned or modern beach bar or spit
- Base of large ice-contact slope
- Trend of large moraine or moraine crest
- Trend of minor moraine or moraine crest; includes De Geer (or washboard) moraines
- Area of hummocky moraine
- Area of palimpsest moraine
- Area of ribbed landforms; includes Rögen (or ribbed) moraine, scabland-type erosional features and/or megaripples
- Trend of esker or esker crest
- Glacial erosion features carved into the bedrock surface (includes striations, grooves, etc.); direction of ice movement known, unknown[bc]
- Crag and tail
- Streamline form with positive relief; includes drumlins and drumlinoid ridges
- Streamline form with negative relief; includes flutes
- Kettle hole
- Large iceberg keel mark
- Large sand dune (aeolian)
- Fluvial channel (direction of flow assumed)
- Forest ring structure (actual size)
- Area of extensive palsas
- Area of suspected karst features
- Province, Indian Reserve, township, park boundary
- Utility
- Road, local road, winter road, trail
- Railroad

[a] *The symbols list applies to Preliminary Maps P.3625 to P.3758, and P.3767. All symbols may not be present on this map.*

[b] *As presented on published and unpublished maps.*

[c] *Numbers, where present, indicate relative ages; 1 = oldest.*

CREDITS

Geology by C. Gao, K.H. Yeung and field assistants, 2017 and 2018.

Additional symbols digitized by J. Bonin.

Preparation of GIS product by K.H. Yeung.

Cartographic production by J. Rickards.

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