THESE TERMS GOVERN YOUR USE OF THIS PRODUCT

Your use of this electronic information product ("EIP"), and the digital data files contained on it (the “Content”), is governed by the terms set out on this page (“Terms of Use”). By opening the EIP and viewing the Content, you (the “User”) have accepted, and have agreed to be bound by, the Terms of Use.

EIP and Content: This EIP and Content is offered by the Province of Ontario’s Ministry of Northern Development and Mines (MNDM) as a public service, on an “as-is” basis. Recommendations and statements of opinions expressed are those of the author or authors and are not to be construed as statement of government policy. You are solely responsible for your use of the EIP and its Content. You should not rely on the Content for legal advice nor as authoritative in your particular circumstances. Users should verify the accuracy and applicability of any Content before acting on it. MNDM does not guarantee, or make any warranty express or implied, that the Content is current, accurate, complete or reliable or that the EIP is free from viruses or other harmful components. MNDM is not responsible for any damage however caused, which results, directly or indirectly, from your use of the EIP or the Content. MNDM assumes no legal liability or responsibility for the EIP or the Content whatsoever.

Links to Other Web Sites: This EIP or the Content may contain links, to Web sites that are not operated by MNDM. Linked Web sites may not be available in French. MNDM neither endorses nor assumes any responsibility for the safety, accuracy or availability of linked Web sites or the information contained on them. The linked Web sites, their operation and content are the responsibility of the person or entity for which they were created or maintained (the “Owner”). Both your use of a linked Web site, and your right to use or reproduce information or materials from a linked Web site, are subject to the terms of use governing that particular Web site. Any comments or inquiries regarding a linked Web site must be directed to its Owner.

Copyright: Canadian and international intellectual property laws protect the EIP and the Content. Unless otherwise indicated, copyright is held by the Queen’s Printer for Ontario.

It is recommended that reference to the Content be made in the following form:


Use and Reproduction of Content: The EIP and the Content may be used and reproduced only in accordance with applicable intellectual property laws. Non-commercial use of unsubstantial excerpts of the Content is permitted provided that appropriate credit is given and Crown copyright is acknowledged. Any substantial reproduction of the Content or any commercial use of all or part of the Content is prohibited without the prior written permission of MNDM. Substantial reproduction includes the reproduction of any illustration or figure, such as, but not limited to graphs, charts and maps. Commercial use includes commercial distribution of the Content, the reproduction of multiple copies of the Content for any purpose whether or not commercial, use of the Content in commercial publications, and the creation of value-added products using the Content.

Contact:

<table>
<thead>
<tr>
<th>FOR FURTHER INFORMATION ON</th>
<th>PLEASE CONTACT:</th>
<th>BY TELEPHONE:</th>
<th>BY E-MAIL:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Reproduction of the EIP or Content</td>
<td>MNDM Publication Services</td>
<td>Local: (705) 670-5691 Toll Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)</td>
<td><a href="mailto:pubsales.ndm@ontario.ca">pubsales.ndm@ontario.ca</a></td>
</tr>
<tr>
<td>The Purchase of MNDM Publications</td>
<td>MNDM Publication Sales</td>
<td>Local: (705) 670-5691 Toll Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)</td>
<td><a href="mailto:pubsales.ndm@ontario.ca">pubsales.ndm@ontario.ca</a></td>
</tr>
<tr>
<td>Crown Copyright</td>
<td>Queen’s Printer</td>
<td>Local: (416) 326-2678 Toll Free: 1-800-668-9938 (inside Canada, United States)</td>
<td><a href="mailto:copyright@gov.on.ca">copyright@gov.on.ca</a></td>
</tr>
</tbody>
</table>
Miscellaneous Release—Data 241
Post-Archean Mafic (Diabase) Dikes and Other Intrusions of Northwestern Ontario, North of Latitude 49°30’
by G.M. Stott and S.D. Josey

The publication can be downloaded from http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD241

Users of OGS products are encouraged to contact those Aboriginal communities whose traditional territories may be located in the mineral exploration area to discuss their project.

Introduction:

This digital data release comprises a GIS-compatible version of Preliminary Map P.3606 (released April 7, 2009), which shows the distribution of Proterozoic mafic (diabase) dikes and other intrusions across northwestern Ontario, north of 49°30’. The map is based on an interpretation of post-Archean features using re-processed aeromagnetic data from regional and high-resolution surveys. The Proterozoic diabase dikes have been grouped into dike swarms where possible. The subdivision of the dikes into separate dike swarms is based on orientation of dike trends in conjunction with available paleomagnetic work on selected dikes (e.g., Buchan et al. 1993; Halls and Davis 2004; Halls et al. 2008) plus U-Pb age determinations of baddeleyite in selected dikes (e.g., Buchan et al. 1993, 1996; Hamilton and Stott 2008 and references therein). Distinction of many dikes with similar trends is difficult and attribution of some dikes to specific swarms (e.g., some assigned to the Mackenzie dike swarm amongst similar trending Matachewan dikes) is speculative. Regional context for the dikes portrayed on this map can be obtained from Buchan and Ernst (2004) and Hamilton and Stott (2008) and references therein.

Other post-Archean intrusions, including carbonatites and related alkalic rocks, are included, some of which are interpreted as such from spatial association with known intrusions. It is intended that this map will stimulate further research in the post-Archean magmatic events. For example, age discrimination amongst sub-parallel dike swarms, such as those trending northeastwards, remain to be resolved. Some of these post-Archean events are accompanied by block rotations (e.g., Halls and Davis 2004) and reactivation along Archean faults, part of a late history that remains a subject of some interest potentially relevant to diamondiferous kimberlite emplacement episodes.

Digital files on this DVD include: ArcGIS® shapefiles (.shp) and associated layer files (.lyr), and Geodatabase (.mdb); a seamless regional Total Field colour aeromagnetic map and 2 shaded regional Total Field aeromagnetic maps, shaded from 45° and 315°, all showing the publicly available high-resolution aeromagnetic coverage across some greenstone belts, embedded in the images.

Note:

Apart from the Jurassic-aged kimberlite pipes of the Attawapiskat cluster, all intrusive rocks within the James Bay and Hudson Bay lowlands (see Stott 2008a, b and c), underlie the Paleozoic cover rocks of the lowlands.

Acknowledgements

Appreciation for their ongoing discussions and comments is extended to Ken Buchan (Geological Survey of Canada), Richard Ernst (Ernst Geosciences; Carleton University), Mike Hamilton (Jack Satterly Geochronology Laboratory, University of Toronto), and Henry Halls, (University of Toronto). W.J Davis (Geological Survey of Canada) and M.A. Hamilton (Jack Satterly Geochronology Laboratory, University of Toronto) are acknowledged for 2 separate, unpublished age determinations.

Using the data with ArcGIS® software:

The data may be accessed with ESRI® ArcGIS® 8.3, and 9.2 or 9.3 software.

- Copy the MRD241 folder to your hard drive from the DVD. Alternately, make a new folder on your hard drive and copy all folders within the MRD241 directory to your new folder.
• For each newly copied folder right-click and uncheck the Read-only option check box so files may be edited.

• The \:Font folder contains the font file OGSFaults.TTF required by ArcGIS for symbolizing the directional arrows on the sinistral and dextral faults. This font should be installed prior to viewing the (.mxd) files in ArcMap. It can be installed by simply copying it to your \:Windows\:Font directory.

• Use ArcGIS to open any of the project files (.mxd), found on the DVD. Please note that at full map extent, regeneration time for some layers may be slow.

• The annotation is stored in a Geodatabase format for the 9.2 version. The annotation is stored as annotation within the (.mxd) if using ArcGIS 8.3.

**Map Projections, Scale and Base Map Information:**


The (.mxd) data frame is projected in Lambert Conic Conformal for display and printing purposes.

The base map, with the exception of the Lakes and Rivers, is the Ministry of Natural Resources’ Land Information Ontario / Natural Resource Values Information System base map. The rivers were digitized from LandSat images and the Lakes are a combination of the Ministry of Natural Resources' Land Information Ontario / Natural Resource Values Information System, LandSat images, and Natural Resources Canada. Users should be aware that, although extensive revisions were performed by staff of the MNDM, the quality of the topographic base may vary from place to place, due to the differences in age and quality of the topographic information available from the various sources.

**Sources of Information**

Digital base map information derived from the Ontario Land Information Warehouse, Land Information Ontario, Ontario Ministry of Natural Resources, scale 1:20 000, and from 1:50 000 scale maps of the National Topographic System (NTS), with modifications by staff of the Ministry of Northern Development and Mines.

The geological data is in part from Stott et al. 2008, OGS 2006 and Buchan and Ernst 2004. See References.

**Credits**


Preparation of base map and digital cartography by S. Josey.
Contents of the DVD

Folder | Files | Description
--- | --- | ---
MRD241 | MRD241 geodatabase V9.2.mxd | ArcMap project file version 9.2 associated with Geodatabase files
MRD241.mdb | Geodatabase containing associated feature classes for MRD241 geodatabase V9.2.mxd
MRD241 shapefiles V8.3.mxd | ArcMap project file version 8.3
Readme.doc | Contains introduction, contents of the DVD, the legend and references.
MRD241.pdf | Adobe (.pdf) version of MRD241
MRD241 Table1.pdf | Adobe (.pdf) of Kimberlite pipe locations
MRD 241 Table2.pdf | Adobe (.pdf) of Geochronology results

Subfolder | Files | Description
--- | --- | ---
Font | OGSFaults.TTF | True type font to be installed in the Windows Font directory for symbolizing faults

Geophysics | TFmag_extended_Colour.tif | Regional Total Field colour aeromagnetic map
TFmagShad_d315i45_.tif | Shaded regional Total Field aeromagnetic map, shaded from 315°
TFmagShad_d45i45_.tif | Shaded regional Total Field aeromagnetic map, shaded from 45°

ShapeFiles | Subfolder | Files | Description
--- | --- | --- | ---
Base | IR_Reserve.shp & .lyr | Indian Reservation polygon shape file and associated v8.3 layer file
NorthONTlakes.shp & .lyr | Northern Ontario lake polygon shape file and associated v8.3 layer file
Prov_Park_Regulated.shp & .lyr | Regulated Provincial park polygon shape file and associated v8.3 layer file
Province_arsc.shp & .lyr | Provincial Border, southern map boundary and James Bay shoreline line shape file and associated v8.3 layer file
Pub_Neatin.shp | Neatline used for publication
Railway.shp & .lyr | Railway line shape file and associated v8.3 layer file
RIVERS.shp & .lyr | Selected rivers not present within the lake polygon shape file as lines, and associated v8.3 layer file
Roads600k.shp & .lyr | Road lines shape file and associated v8.3 layer file
Settlement100k.shp & .lyr | Northern Ontario Settlement point shape file and associated v8.3 layer file
Utility.shp & .lyr | Utility line shape file and associated v8.3 layer file

Geology | DIKES_FINAL_2008.shp & .lyr | Dike line shape file and associated v8.3 layer file
Faults.shp & .lyr | Fault line shape file and associated v8.3 layer file
GabbroSillsCarbonatite.shp & .lyr | Mafic dikes and sills, intrusive rocks and carbonatite polygon shape file and associated v8.3 layer file
GEOCHRONOLOGY.shp & .lyr | Geochronology location point shape file and associated v8.3 layer file
KIMBERLITES.shp & .lyr | Kimberlites, Carbonatite/alkaline complex, and alkalic ultramafic diatreme breccia point shape file and associated v8.3 layer file
Legend

PRECAMBRIAN

MESOPROTEROZOIC

35 Alkalic Intrusive Suite and Carbonatite (circa 1.1 to 1.2 Ga): Alkaline syenite, ijolite, associated mafic and ultramafic rocks, and minor carbonatite
   35a Martison Carbonatite Complex

34 Mafic Dikes and Related Intrusive Rocks (circa 1.1 to 1.2 Ga)
   34a Nipigon mafic sills circa 1100-1115 Ma
   34b Mafic sills and dikes (circa 1130-1180), including the Mine Centre dike (circa 1137±20 Ma), the Empey Lake dike (circa 1178±31 Ma), and the Kipling (Abitibi) dike (circa 1140 Ma).
   34c Ultramafic, gabbroic and granophyric intrusions (probably related to 35a)

33 Mafic Dikes
   33a Mackenzie mafic dike swarm (1267 Ma)
   33b Sudbury mafic dike swarm (ca. 1235-1238)

PALEOPROTEROZOIC

27 Carbonatite-Alkalic Intrusive Suite (circa 1.8 to 1.9 Ga): Carbonatite complex and associated rocks

26 Mafic Dikes and Sills
   26a Sutton Inliers: gabbroic sills of the Molson event (circa 1871 Ma)
   26b Pickle Crow mafic dike; normally magnetized northwest-trending subswarm (Molson swarm) (circa 1876 Ma)
   26c Pickle Crow mafic dike; reversely magnetized northwest-trending subswarm (Molson swarm) (circa 1876 Ma)
   26d Mafic dikes of uncertain age, including west-northwest-trending Wabigoon dike

23 Mafic Dikes
   23a Marathon mafic dike; north-northwest to north-northeast-trending subswarm (circa 2101 to 2126 Ma)
   23b Fort Frances mafic dike; northwest trending subswarm (circa 2075 Ma)
   23c Marathon, Kapuskasing or Biscotasing mafic dike; northeast-trending subswarm (circa 2101-2126 or circa 2167-2171 Ma)
   23d Biscotasing mafic dike; north-northeast-trending swarm (circa 2167-2171 Ma)

17 Mafic Dikes
   17a Matachewan mafic dike; northwest-trending swarm (circa 2454 Ma)
Kimberlites

- Alkalic ultramafic diatreme breccia
- Carbonatite/alkalic complex
- Kimberlite
- Geochronology location

Dikes

- 17a - Matachewan mafic dike; northwest-trending swarm (circa 2454 Ma)
- 23a - Marathon mafic dike; north-northeast to north-northeast-trending subswarm (circa 2101 to 2126 Ma)
- 23b - Fort Frances mafic dike; northwest trending subswarm (circa 2075 Ma)
- 23c - Marathon, Kapuskasing or Biscotasing mafic dike; northeast-trending subswarm (circa 2101-2126 or circa 2167-2171 Ma)
- 23d - Biscotasing mafic dike; north-northeast-trending swarm (circa 2167-2171 Ma)
- 26b - Pickle Crow mafic dike; normally magnetized northwest-trending subswarm (Molson swarm) (circa 1876 Ma)
- 26c - Pickle Crow mafic dike; reversely magnetized northwest-trending subswarm (Molson swarm) (circa 1876 Ma)
- 26d - Mafic dikes of uncertain age, including west-northwest-trending Wabigoon dike
- 33a - Mackenzie mafic dike swarm (1267 Ma)
- 33b - Sudbury mafic dike swarm (ca. 1235-1238)
- 34b - Mafic sills and dikes (circa 1130-1180), including the Mine Centre dike (circa 1137±20 Ma), the Empye Lake dike (circa 1178±31 Ma), and the Kipling (Abitibi) dike (circa 1140 Ma)

Faults

- MFTDXTI - Fault, dextral horizontal component, trend, interpreted
- MFTSXTI - Fault, sinistral horizontal component, trend, interpreted
- MFTUXTI - Fault, unknown horizontal component, trend, interpreted

Symbols

- Settlement100k
- Railway
- Abandoned
- Utility Line
- Indian Reservation
- Provincial Park regulated
- Neatline
- Provincial Border
- Shoreline
- Primary
- Secondary
- Trail
- River
- Lake
References

(those in italics provide reference to radiometric age determinations of units on this map)

Buchan, K.L. and Ernst, R.E. 2004. Diabase dyke swarms and related units in Canada and adjacent regions; Geological Survey of Canada, Map 2022A, scale 1:5 000 000 with accompanying notes.


