

## THESE TERMS GOVERN YOUR USE OF THIS DOCUMENT

***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 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:

Cutts, J.A. 2014. Geological, geochemical, geophysical and petrographic data related to a study of plutons intruded *circa* 1090 to 1065 Ma in the southeastern Central Metasedimentary Belt, Grenville Province; Ontario Geological Survey, Miscellaneous Release—Data 311.

**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:

FOR FURTHER INFORMATION ON	PLEASE CONTACT:	BY TELEPHONE:	BY E-MAIL:
The Reproduction of the EIP or Content	MNDM Publication Services	Local: (705) 670-5691 Toll-Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	<a href="mailto:Pubsales.ndm@ontario.ca">Pubsales.ndm@ontario.ca</a>
The Purchase of MNDM Publications	MNDM Publication Sales	Local: (705) 670-5691 Toll-Free: 1-888-415-9845, ext. 5691 (inside Canada, United States)	<a href="mailto:Pubsales.ndm@ontario.ca">Pubsales.ndm@ontario.ca</a>
Crown Copyright	Queen’s Printer	Local: (416) 326-2678 Toll-Free: 1-800-668-9938 (inside Canada, United States)	<a href="mailto:Copyright@gov.on.ca">Copyright@gov.on.ca</a>

For information on purchasing all publications, including digital data, contact:

Publication Sales

Ministry of Northern Development and Mines

933 Ramsey Lake Rd., Level A3

Sudbury, Ontario P3E 6B5

Tel: 1-888-415-9845, ext. 5691 (toll-free inside Canada and the United States)

Tel: (705) 670-5691 (local calls)

Fax: (705) 670-5770

---

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.

---

Miscellaneous Release—Data 311

**Geological, Geochemical, Geophysical and Petrographic Data Related to a Study of Plutons Intruded *Circa* 1090 To 1065 Ma in the Southeastern Central Metasedimentary Belt, Grenville Province**

by

J.A. Cutts<sup>1,2</sup>

This publication can be downloaded from

[http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm\\_dir.asp?type=pub&id=MRD311](http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD311)

This digital data release contains photographs of outcrops, hand samples and thin sections; whole rock and isotope geochemical data; magnetic susceptibility and scintillometer data collected between May 2010 and October 2013 as part of a study of the plutons intruded *circa* 1090 to 1065 Ma in the southeastern Central Metasedimentary Belt (Project Unit 11-013). This project was supported by the Ontario Geological Survey and constitutes and in part fulfills the requirements of a Master of Science (MSc) thesis at Carleton University by the author. This release consists of 155 images as *jpg* files, 17 scanning electron microscope cathodoluminescence images as *tif* files, 6 Microsoft<sup>®</sup> Excel<sup>®</sup> 2010 (*.xlsx*) files and 5 supporting documents in portable document format (*.pdf*).

The files are on one CD-ROM. The data and supporting documents are organized in the following file structure.

---

<sup>1</sup> Earth Resources and Geoscience Mapping Section, Ontario Geological Survey, Sudbury, Ontario

<sup>2</sup> Department of Earth Sciences, Carleton University, Ottawa, Ontario

/root directory  
*metadata.html*  
*readme.pdf*  
/data  
  /Geochemistry and Geochronology  
    *MRD 311 Isotope Geochemistry.xlsx*  
    *MRD 311 Whole-rock geochemistry.xlsx*  
    *MRD 311 Isotope Geochemistry Procedures.pdf*  
    *MRD 311 U-Pb Geochronology Procedures.pdf*  
  /Geophysics  
    *MRD 311 1070 pluton magnetic susceptibility data.xlsx*  
    *MRD 311 1070 pluton scintillometer data.xlsx*  
  /Petrography  
    *MRD 311 Mineral Separate Descriptions.xlsx*  
    *MRD 311 Thin-section Descriptions.xlsx*  
  /Photographs  
    /Hand Sample Photographs  
    /Outcrop Photographs  
    /Photomicrographs  
    /U-Pb Zircon SEM Images  
    *MRD 311 photograph captions.pdf*  
  /Presentations and Publications  
    *MRD 311 SFW 2011.pdf*  
    *MRD 311 SFW 2012.pdf*

## Description of the File Contents

1. *metadata.html* - information about the data in this publication
2. *readme.pdf* - this file
3. **Geochemistry and Geochronology** – This folder contains 2 Microsoft<sup>®</sup> Excel<sup>®</sup> 2010 files in *.xlsx* format and 2 *.pdf* files.
  - a. *MRD 311 Isotope Geochemistry.xlsx*

This workbook contains 8 worksheets ( tabs): “Sm-Nd Batch 1” and “Sm-Nd Batch 2” contain the raw data collected by Thermal Ionization Mass Spectrometry (in red) and the formulas which reduce the raw data to the final results, which are also duplicated in a simpler format under the tabs, “Sm-Nd Results Batch 1” and “Sm-Nd Results Batch 2”. Tabs “Sm-Nd 2-sigma errors Batch 1” and “Sm-Nd 2-sigma errors Batch 2” contain the calculations and values for the 2 $\sigma$  error for each sample. The final 2 tabs, “Sr results Batch 1” and “Sr results Batch 2” contain the raw data collected by Thermal Ionization Mass Spectrometry (in red), the data-reducing formulae and the results.

Procedures for Sm-Nd and Sr isotope chemistry are outlined in file *MRD 311 Isotope Geochemistry Procedures.pdf*. Similarly, procedures for U–Pb geochronology are provided in file *MRD 311 U–Pb Geochronology Procedures.pdf*.

b. *MRD 311 Whole-rock geochemistry.xlsx*

This workbook contains 2 worksheets (tabs): “Whole-rock geochemistry” contains the results of all geochemical analyses performed at the Ontario Geological Survey Geoscience Laboratories (GeoLabs) in Sudbury, Ontario, as well as some older published and unpublished data supplied by R.M. Easton, Earth Resources and Geoscience Mapping Section, Ontario Geological Survey. The methods used, lower detection limit for each method and reported units for each method are included for each element (and oxide) listed. This worksheet also contains location data (“Easting”, “Northing” and “Township”), “Rock Type” and stratigraphic information, if known, for each sample collected in North American Datum 1983 (NAD83), zone 18. The worksheet “Duplicate Analyses” contains major element geochemical data and graphs for duplicate analyses and quality control samples for selected samples as provided by the Ontario Geological Survey GeoLabs in Sudbury, Ontario.

**4. Geophysics** – This folder contains 2 Microsoft® Excel® 2010 files.

a. *MRD 311 1070 pluton magnetic susceptibility data.xlsx*

This workbook contains 2 worksheets (tabs): “Magnetic Susceptibility Data”, contains the raw data collected using an Exploranium® KT-9 magnetic susceptibility meter and the “Pick Lists, Notes” tab which contains the pick lists utilized in the “Magnetic Susceptibility Data” worksheet. In addition to the plutons studied as part of the thesis project, this table also includes magnetic susceptibility data for other *circa* 1090 to 1065 Ma plutons from the Central Metasedimentary Belt, collected by R.M. Easton.

Magnetic susceptibility is defined as the degree to which a substance can be magnetized and, in this case, is expressed as the ratio of the intensity of magnetization (k) to the ratio of the earth’s magnetic field to magnetic field induced by the susceptibility meter. The readings (k) are expressed as  $10^{-3}$  times the SI unit for susceptibility and are dimensionless. The minimum value that can be recorded by the meter is 0.01 times  $10^{-3}$  SI units; the largest value is 999 times  $10^{-3}$  SI units. Sample location information is given in UTM zone 18 co-ordinates, NAD83 datum.

b. *MRD 311 1070 pluton scintillometer data.xlsx*

This workbook comprises 2 worksheets (tabs): “Scintillometer Data”, contains the raw data collected using a portable gamma-ray scintillometer and the “Pick Lists, Notes” tab, which contains the pick lists utilized in the “Scintillometer Data” worksheet. In addition to the plutons studied as part of the thesis project, this table also includes magnetic susceptibility data for other *circa* 1090 to 1065 Ma plutons from the Central Metasedimentary Belt collected by R.M. Easton. Sample location information is given in UTM zone 18 co-ordinates, NAD83 datum.

All data were recorded using an Exploranium® GR-130 MiniSpec gamma ray spectrometer, serial number 4885, calibrated on February 22, 2006 using a NaI crystal and software version 501GEO. The instrument was stabilized daily and data was recorded using the assay mode with a 5 minute count time. Quoted accuracy is 0.1% K, 0.4 ppm U and 0.7 ppm Th for a sample with 2% K, 2 ppm U and 8 ppm Th. Easton (2009) provides precision and reproducibility data for the instrument.

**5. Petrography** - This folder contains 2 Microsoft® Excel® 2010 files.

a. *MRD 311 Mineral Separate Descriptions.xlsx*

This workbook contains 5 worksheets (tabs), one for each of the 5 intrusions on which U–Pb geochronology was performed. Each tab describes the mineral separates from the various samples.

b. *MRD 311 Thin Section Descriptions.xlsx*

This workbook contains 8 worksheets (tabs), one for each of the 8 intrusions examined as part of this project. Each worksheet (tab) contains modal analyses for all samples collected during this study, as well as notes on mineral and rock textures.

**6. Photographs** – This folder contains 155 .jpg files, 17 .tif files and 1 .pdf file.

This folder contains 4 subfolders: “Hand Sample Photographs”, “Outcrop Photographs”, “Photomicrographs” and “U-Pb Zircon SEM Images”. Captions for the images in all 4 subfolders are contained in the file *MRD 311 photograph captions.pdf*. All location information is in NAD83 Datum, one 18.

**7. Presentations and Publications**

This folder contains presentations (oral and poster) and publications produced by the author throughout the three-year span of this project. These include:

a. *MRD 311 SFW 2011.pdf*

An Ontario Geological Survey Summary of Field Work article which outlines the activities and results related to the project (Project Unit 11-013) during 2011.

b. *MRD 311 SFW 2012.pdf*

An Ontario Geological Survey Summary of Field Work article which outlines the activities and results for the project (Project Unit 11-013) during 2012.

c. Presentation at the Geological Association of Canada–Mineralogical Association of Canada, Joint Annual Meeting in Winnipeg, Manitoba, May 25-27, 2013 (not included in this publication).

Cutts, J.A., Easton, R.M. and Carr, S.D. 2013. Circa 1060–1090 syn- to post-orogenic plutonism in the Grenville Province of Ontario: Insights from major, trace element and isotope geochemistry; Geological Association of Canada–Mineralogical Association of Canada, Joint Annual Meeting, Winnipeg, Manitoba, May 25-27.

**Acknowledgments**

This study focussed on the geology, geochemistry and geochronology of a suite of plutons intruded *circa* 1090 to 1065 Ma in the southeastern Central Metasedimentary Belt of the Grenville Province, with the intent of determining the characteristics of the melt source for these intrusions.

The data presented in this publication were acquired in partial fulfillment of the requirements of a Master of Science thesis by the author at Carleton University under the supervision of Dr. S.D. Carr, Dr. J. Blenkinsop, Dr. A. Fowler and Dr. R.M. Easton (Cutts 2013).

Further information pertaining to this body of work is available through the author.

## References

- Cutts, J.A. 2013. Age and geochemical character of granite and syenite plutons in the Grenville Province of southeastern Ontario: Insights into magmatism during the Ottawa orogeny and evidence of the Frontenac intrusive suite in the Sharbot Lake domain; unpublished MSc thesis, Carleton University, Ottawa, Ontario, 109p.
- Easton, R.M. 2009. Characterization of rock units in the Grenville and Southern Provinces by in-situ geophysical measurements and geochemistry; in Summary of Field Work and Other Activities, 2009, Ontario Geological Survey, Open File Report 6240, p.9-1 to 9-4.