



Mines

**GEOCHEMICAL DATA FROM THE MONTAGNAIS GABBRO
SILLS, MARTIN LAKE RHYOLITE AND ASSOCIATED
SEDIMENTARY ROCKS IN THE HOLLINGER LAKE
AND MARION LAKE AREAS, LABRADOR
(NTS MAP AREAS 23J/16 AND 23I/13)**

J.P. Butler

Open File LAB/1751

**St. John's, Newfoundland
May, 2019**

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Recommended citation:

Butler, J.P.

2019: Geochemical data from the Montagnais Gabbro sills, Martin Lake rhyolite and associated sedimentary rocks in the Hollinger Lake and Marion Lake areas, Labrador (NTS map areas 23J/16 and 23I/13). Government of Newfoundland and Labrador, Department of Natural Resources, Geological Survey, Open File LAB/1751, 8 pages.



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SUMMARY

This Open File release presents whole-rock geochemical data for 111 samples collected from the Hollinger Lake and Marion Lake areas in western Labrador (NTS map areas 23J/16 and 23I/13; Figure 1). Sampling was conducted in 2017 as part of a multi-year project exploring the regional geology and economic potential of the south-central Labrador Trough. Analyzed rock types include gabbro, rhyolite and associated low-grade metasedimentary rocks of the Kaniapiskau Supergroup. Additional geochemical data from the Hollinger Lake and Marion Lake areas, as well as adjacent map areas, are presented in Conliffe and Smith (2018). For information on the regional geology of the Hollinger Lake area, *see* Butler (2018) and Smith *et al.* (2018). The geology of the Marion Lake area was most recently described by Wardle (1979).

NOTES ON THE DATABASE

The database presents the results of whole-rock, trace-element, and rare-earth element (REE) geochemical analyses for 111 samples. Sample coordinates, reported as Universal Transverse Mercator (UTM) eastings and northings (zone 19, NAD27), are provided in Appendix A along with brief sample descriptions. The data are available in digital format (*i.e.*, *.csv comma-separated value files) through the links provided in the Appendices.

All samples were prepared and analyzed at the Geological Survey of Newfoundland and Labrador's (GSNL) Geochemistry Laboratory in St. John's, following the protocols outlined by Finch *et al.* (2018). Additional analyses (for trace elements including Au) of selected samples were conducted by Maxxam Analytics.

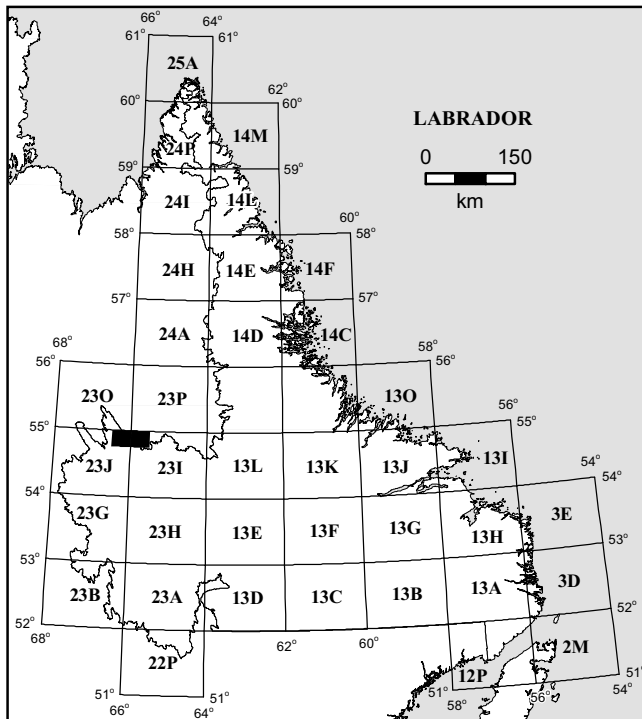


Figure 1. Location map of study area.

The data are presented in their raw form along with standard and duplicate analyses in a series of appendices. Appendix B presents major-element compositions (in addition to Ba, Be, Cr, Sc and Zr; *see* Table 1 for element list) determined by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) following borate fusion. Ferrous iron (FeO) was calculated following the method of Wilson (1960). Volatiles were determined by loss-on-ignition (LOI) at 1000°C. Appendix C presents concentrations of trace elements consisting of As, Cd, Co, Cu, Li, Ni, Pb, Rb, V, and Zn, determined by ICP-OES following 4-acid digestion. Appendix D presents rare-earth element (REE) and additional trace-element concentrations determined by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) following borate fusion. Appendix E presents fluoride (F-)

Table 1. Analytical methods for geochemical analyses

Appendix	Analysis	Analytical Method	Preparation
B	Al ₂ O ₃ , Ba, Be, CaO, Cr, Fe ₂ O ₃ , K ₂ O, MgO, MnO, Na ₂ O, P ₂ O ₅ , Sc, SiO ₂ , TiO ₂ , Zr	ICP-OES	50-50 lithium tetraborate/lithium metaborate fusion
C	As, Cd, Co, Cu, Li, Ni, Pb, Rb, V, Zn	ICP-OES	Hf-HCl-HNO ₃ -HClO ₄ digestion
D	Ga, Ge, Sr, Y, Nb, Mo, Sn, Cs, La, Ce, Pr, Nd, Sm, Eu, Tb, Gd, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Tl, Bi, Th, U	ICP-MS	
E	F	ISE	Na ₂ CaO ₃ and KNO ₃ fusion
F	Ag	ICP-OES	HNO ₃ digestion
G	Au, Sb, As, Ba, Br, Ce, Co, Cs, Cr, Eu, Fe, Hf, La, Lu, Mo, Rb, Sm, Sc, Se, Na, Ta, Tb, Th, U, W, Yb, Zr	INAA	Irradiation

concentrations determined by Ion-Selective Electrode Determination. Appendix F presents silver (Ag) concentrations determined by ICP-OES following digestion in nitric acid. Finally, Appendix G presents additional concentrations of certain elements (including Au) determined by Instrumental Neutron Activation Analysis (INAA) for selected samples. Complete details of the analytical procedures described above are provided by Finch *et al.* (2018).

Major elements are reported in weight percent (wt. %), whereas minor and trace elements are reported in parts per million (ppm), except for Au, which is reported in parts per billion (ppb). Detection limits for each element are provided in the appendices alongside the data. A negative value indicates that the concentration of the specific element was below the detection limit (*e.g.*, -0.01 indicates that the measured value was below the detection limit of 0.01). The code -99 indicates that the sample was not analyzed for that element. Gain-on-ignition (GOI) for LOI determination is represented by the code -1. Standard and duplicate analyses (of selected samples) are included in each appendix to help readers assess the accuracy and precision of the data.

ACKNOWLEDGMENTS

Sample preparation and analyses were conducted under the supervision of Chris Finch of the GSNL Geochemistry Laboratory. Special thanks are extended to Wayne Tuttle, Oksana Choulik (McGill Subarctic Research Station), Ben MacDougall and James Conliffe. Alana Hinchey and Pauline Honarvar provided helpful reviews.

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APPENDICES

The data are available as digital comma-separated files (.csv) through [this link](#).

APPENDIX A: Sample Locations and Descriptions

APPENDIX B: Major-element ICP-OES-FUS Data (standard and duplicate samples)

APPENDIX C: Trace-element ICP-OES 4-Acid Data (standard and duplicate samples)

APPENDIX D: Trace-element ICP-MS-FUS Data (standard and duplicate samples)

APPENDIX E: Fluoride (F-) ISE Data (standard and duplicate samples)

APPENDIX F: Silver (Ag) ICP-OES-HNO₃ Data (standard and duplicate samples)

APPENDIX G: Gold (Au) (and Additional Elements) INAA Data (standard data)