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GEOCHEMICAL DATA RELATED TO MINERAL OCCURRENCES IN THE EASTERN LABRADOR TROUGH (NTS MAP AREAS 23I/12, 13 AND 23J/16) LABRADOR

J. Conliffe

Open File LAB/1761

St. John's, Newfoundland
February, 2020

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SUMMARY

This Open File release consists of whole-rock geochemistry of 34 samples collected in western Labrador in 2017 and 2018. The sample locations are located in the eastern Labrador Trough (NTS map areas 23I/12, 13 and 23J/16), and were sampled during a multi-year project investigating the metallurgy and mineral potential of the region. The samples represent mineralized and unmineralized rock types from a number of known mineral occurrences and associated supracrustal rocks of the Kaniapiskau Supergroup. For more information on the regional geological setting and geological characteristics of the rock units, the reader is referred to Wardle (1979) and Butler (2018, 2019).

NOTES ON DATABASE

This database includes the results of whole-rock, trace-element and rare-earth-element (REE) analyses of 34 samples. Also included are the sample-location data and brief sample descriptions. The location data are presented in Appendix A, with locations reported as Universal Transverse Mercator (UTM) eastings and northings (Zone 20, NAD27). The data are available in digital format (*i.e.*, *.csv comma-separated values files).

All samples selected for geochemical analysis were prepared at the Geological Survey of Newfoundland and Labrador's (GSNL) geochemistry laboratory in St. John's. Samples were milled using ceramic mills. Most analyses were carried out at the GSNL geochemistry laboratory and analytical methods are described in Finch *et al.* (2018) and summarized in Table 1. Additional analyses (for trace elements including Au) of selected samples were conducted by Maxxam Analytics, ON (now Bureau Veritas Laboratories).

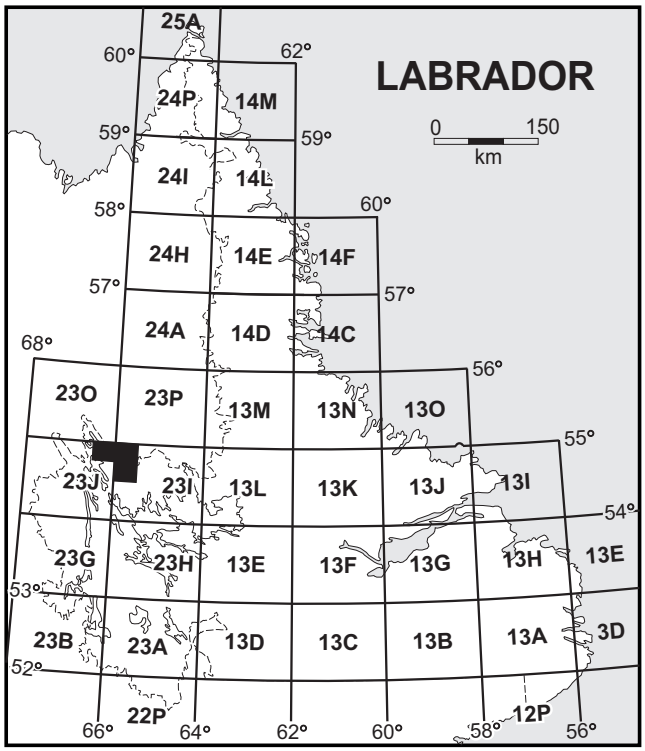

Figure 1. *Location map of the study areas.*

Major-element compositions (plus Ba, Be, Cr, Sc and Zr) were analyzed by ICP-OES methods, following lithium tetraborate and metaborate fusion. The REE and selected trace elements were determined by ICP-MS analysis following an identical sample digestion procedure, whereas other trace elements (As, Cd, Co, Cu, Li, Ni, Pb, Rb, V and Zn) were analyzed by ICP-MS after total 4-acid digestion. Volatiles are represented as loss-on-ignition (LOI) at 1000°C, which represents the breakdown of all minerals and release of all volatiles. The ferrous-iron content (FeO) of silicate rocks is determined by the Wilson Method (Wilson, 1960), as outlined by Finch *et al.* (2018). For silver analysis, 0.5 g of sample

Table 1. Analytical methods for geochemical analyses

Analysis	Analytical Method	Preparation/Digestion
SiO_2, Al_2O_3, Fe_2O_3, MgO, CaO, Na_2O, K_2O, TiO_2, MnO, P_2O_5, Ba, Be, Cr, Sc, Zr	Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)	50-50 Lithium Tetraborate Lithium Metaborate Fusion
As, Cd, Co, Cu, Li, Ni, Pb, Rb, V, Zn	Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)	HF-HCl-HNO_3-$HClO_4$ (total digestion)
Bi, Ce, Cs, Dy, Er , Eu, Ga, Gd, Ge, Hf, Ho, La, Lu, Mo, Nb, Nd, Pr, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, W, Y, Yb	Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	50-50 Lithium Tetraborate Lithium Metaborate Fusion
F	Ion Selective Electrode (ISE)	Na_2CO_3 and KNO_3 fusion
Ag	Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)	HNO_3 digestion
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	Instrumental Neutron Activation Analysis (INAA)	Irradiation
LOI	Gravimetric (Grav) at 1000°C	None

powder were weighed into a 15 ml digestion tube with 2 ml of concentrated nitric acid, and digested for two hours. The digested sample was analyzed by ICP-OES (Finch *et al.*, 2018). Fluoride was analyzed using ion-specific electrode (ISE). Appendix G presents additional concentrations of certain elements (including Au) determined by Instrumental Neutron Activation Analysis (INAA) for selected samples.

Major elements are reported in weight percent (wt. %), and minor and trace elements are reported in parts per million (ppm), except gold (Au, parts per billion, ppb). A negative number indicates the concentration of the specific element in the sample was below the detection limit (*e.g.*, -0.01 indicates the measured value was below the detection limit of 0.01). Detection limits are listed for each element in the .csv files. In Appendix G, some elements have elevated detection limits due to high levels of various elements. The code -99 indicates the sample was not analyzed for that element.

Analytical duplicates were inserted at a frequency of one in 20, with the duplicate selected at random. In addition, a selection of reference standards was analyzed, also at a frequency of one in 20. The raw, unprocessed data from duplicates and standards are included in the appendices, and can be used by the reader to assess accuracy and precision.

ACKNOWLEDGMENTS

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APPENDICES A–E

Appendices A–G are available as digital comma-separated files (.csv) through this link.

Appendix A: Sample Location and Descriptions
Appendix B: Major-element ICP-OES FUS Data (including standards and duplicate samples)
Appendix C: Trace-element ICP-OES 4-Acid Data (including standards and duplicate samples)
Appendix D: Trace-element ICP-MS FUS Data (including standards and duplicate samples)
Appendix E: Silver (Ag) ICP-OES HNO_3 Data (including standards and duplicate samples)
Appendix F: Fluoride (F) ISE Data (including standards and duplicate samples)
Appendix G: Gold (Au) (and Additional Elements) INAA Data (including standards and duplicate samples)