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Handley, L.A. and Dyer, R.D. 2022. Geochemistry and soil gas hydrocarbon data from a peat sampling transect over the Eagle’s Nest nickel-copper and Blackbird chromium deposits, McFaulds Lake (“Ring of Fire”) area, northern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 399.

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Miscellaneous Release—Data 399

Geochemistry and Soil Gas Hydrocarbon Data from a Peat Sampling Transect over the Eagle’s Nest Nickel-Copper and Blackbird Chromium Deposits, McFaulds Lake (“Ring of Fire”) Area, Northern Ontario

by L.A. Handley and R.D. Dyer

This publication can be downloaded from

http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD399

This digital data release provides inorganic (metals) geochemistry and soil gas hydrocarbon data, including quality-control data, for peat samples collected from 13 sites in the McFaulds Lake (“Ring of Fire”) area in northern Ontario. The samples were collected along an approximately north-to-south 5 km transect spanning the McFaulds Lake greenstone belt, centred on the Eagle’s Nest nickel-copper (Ni-Cu) and Blackbird chromium (Cr) deposits.

The organic peat samples were analyzed for loss-on-ignition (LOI) and soil gas hydrocarbons (SGH), and analyzed using inductively coupled plasma optical emission spectrometry (ICP–OES), inductively coupled plasma mass spectrometry (ICP–MS) and instrumental neutron activation analysis (INAA). Quality-control data consist of the results from the analysis of duplicate pairs and internal reference materials and are included in this release. The ICP–MS, ICP–OES and LOI analyses were conducted by the OGS Geoscience Laboratories in Sudbury. The INAA analyses were completed by Becquerel Laboratories in Mississauga. The soil gas hydrocarbon (SGH) analyses were completed by Activation Laboratories Ltd. in Ancaster, Ontario. All location information is presented as Universal Transverse Mercator (UTM) co-ordinates using North American Datum 1983 (NAD83) in Zone 16. Data are available as 6 Microsoft® Excel® for Office 365 (.xlsx) files and are accompanied by supporting documentation in portable document format (.pdf).

Contents

The following files are included in this release:

<i>MRD399_readme.pdf</i>	this file
<i>MRD399_metadata.pdf</i>	information about this publication
<i>MRD399_Peat_ICP_INAA_Data.xlsx</i>	ICP and INAA geochemical analytical data
<i>MRD399_Peat_ICP_INAA_QC_RM.xlsx</i>	ICP and INAA geochemical analytical data – quality control and reference materials data
<i>MRD399_Peat_ICP_INAA_QC_Dups.xlsx</i>	ICP and INAA geochemical analytical data – quality control and duplicate pairs data

<i>MRD399_Peat_SGH_Data.xlsx</i>	soil gas hydrocarbon (SGH) analytical data
<i>MRD399_Peat_SGH_RMs_Blanks.xlsx</i>	soil gas hydrocarbon (SGH) analytical data – reference materials and blanks data
<i>MRD399_Peat_SGH_DUPS_REPs.xlsx</i>	soil gas hydrocarbon (SGH) analytical data – duplicates and replicates data

Background Information

This digital data release consists of peat geochemistry and hydrocarbon data and related quality control data. The field work was completed in the summer of 2012, in conjunction with regional lake sediment geochemistry (see Dyer 2012; Dyer and Burke 2012; Dyer and Handley 2013, 2014, 2015; Handley and Dyer 2018).

Utilizing a Dutch auger, each sample was collected from a depth of approximately 10 to 50 cm below ground surface. Samples were separated into 2 streams for laboratory analysis: the first set for conventional sample preparation and digestion for inorganic metal analysis and the second stream (wet unprepared samples) for hydrocarbon analysis.

For the metals analysis, samples were dried at a temperature <40°C prior to disaggregation and sieving through –50 mesh sieves. Loss on ignition (LOI) analysis at 500°C was performed on a subsample (1 g) of the prepared pulp material. A subsample (0.5 g) of each prepared (–50 mesh) pulp was digested in aqua regia prior to inductively coupled plasma optical emission spectrometry (ICP–OES) and inductively coupled plasma mass spectrometry (ICP–MS) analysis. A 10 g subsample was separated and sent for thermal irradiation, instrumental neutron activation analysis (INAA). Quality control data consisting of the results from the analysis of duplicate pairs and internal reference materials are included in this release. The ICP–MS, ICP–OES and LOI analyses were conducted by Geoscience Laboratories and INAA analysis was completed by Becquerel Laboratories.

For the soil gas hydrocarbon analysis, the wet samples were refrigerated and kept cool during transport to Activation Laboratories Ltd. Sample preparation involved oven drying at <40°C followed by sieving at –60 mesh. A very weak leach was used to extract surface and interstitial hydrocarbon compounds and this extract was separated by high-resolution capillary column gas chromatography and then detected by mass spectrometry to measure the presence of 162 individual hydrocarbon compounds, each with a reporting limit of 1 part per trillion (ppt). The results of the SGH analysis are considered “semi-quantitative” concentrations and are reported without any additional statistical modification.

References

- Dyer, R.D. and Burke, H.E. 2012. Preliminary results from the McFaulds Lake (“Ring of Fire”) area lake sediment geochemistry pilot study, northern Ontario; Ontario Geological Survey, Open File Report 6269, 26p.
- Dyer, R.D. and Handley, L.A. 2013. McFaulds Lake (“Ring of Fire”) area high-density lake sediment and water survey, Far North, Ontario; *in* Summary of Field Work and Other Activities, 2013, Ontario Geological Survey, Open File Report 6290, p.31-1 to 32-17.
- 2014. McFaulds Lake (“Ring of Fire”) area lake, stream and till geochemistry in-fill sampling, Far North, Ontario; *in* Summary of Field Work and Other Activities, 2014, Ontario Geological Survey, Open File Report 6300, p.28-1 to 28-5.
- 2015. McFaulds Lake (“Ring of Fire”) area stream sediment geochemistry; Ontario Geological Survey, Miscellaneous Release—Data 321.
- Handley, L.A. and Dyer, R.D. 2018. McFaulds Lake (“Ring of Fire”) area lake sediment and water geochemistry, northern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 373.