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2015

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2015

doi:10.4095/296429

This publication is available for free download through GEOSCAN (http://geoscan.nrcan.gc.ca/).

Contribution to the Geo-Mapping for Energy and Minerals Program (GEM) 2008-2013

Recommended citation
Paulen, R.C., McClenaghan, M.B., and Duso, G., 2015. Till geochemistry data for till samples from the Izok Lake Zn-Cu-Pb-Ag Volcanogenic Massive Sulphide Deposit, Nunavut: till samples collected in 2012; Geological Survey of Canada, Open File 7770, 1 zip file. doi:10.4095/296429

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ABSTRACT

Fifteen till samples from around the Izok Lake Zn-Cu-Pb-Ag VMS deposit in Nunavut were collected in 2012 to complement data for Geological Survey of Canada samples collected in 2009 and 2010 as part of an indicator mineral study to determine the indicator minerals and trace element signatures that are indicative of the deposit. The purpose of this open file is to report the raw till matrix (<0.063 mm) geochemistry and sedimentological data for these 15 till samples. Till samples were prepared by the Geological Survey of Canada's Sedimentology Lab and analyzed at ACME Analytical Laboratories, Vancouver. Sample locations, carbonate content, carbon content, grain size and geochemical data are reported in this open file.

INTRODUCTION

Fifteen till samples were collected 2012 near the Izok Lake Zn-Cu-Pb-Ag VMS deposit (Fig. 1) in Nunavut to complement data for 64 till samples collected in 2009 and 2010 around the deposit as part of an indicator mineral study. The purpose of this open file is to report the geochemical and other sedimentological data for those 15 samples collected in 2012. Geochemical data for the 2009 and 2010 till samples have been reported in GSC Open File 7046 (Hicken et al., 2012).

METHODS

Field sampling

All 2012 till sample locations are listed in **Appendix A**. Samples were collected from hand-dug holes in mudboils because this method is cost effective and pits can be dug to >0.75 m depth into less oxidized till from sites accessed by helicopter. Sampling methods followed the protocol of Spirito et al. (2011). Striation measurements were also collected from nearby outcrops, when possible. Photographs of each sample site were published in GSC Open File 7386 (McClenaghan et al., 2013).

Till matrix grain size and carbon content

Grain size analyses of the till matrix (<2 mm) of the 2012 till samples were determined in the GSC's Sedimentology Lab, Ottawa (Fig. 2). Percentages of clay (<0.002 mm), silt (0.002-0.063 mm), and sand (0.063-2.0 mm) were determined by wet sieving in a stack of sieves for the >0.063 mm and using a Lecotrac LT-100 Particle Size Analyzer and data are reported in **Appendix B1**. Munsell colours were determined on moist samples. Samples were analyzed using the CM 5015 Coulometer/Acid Evolution to determine percentages of calcite and dolomite but samples contained less than detection limit values of CO_2 and data are reported in **Appendix B2**. Total carbon, organic and inorganic carbon contents and loss on ignition (LOI) were determined at GSC using the LECO Cr 412 Carbon Determinator. Total %C and inorganic %C were determined for samples heated to 1350°C and LOI was determined for samples heated to 500°C for 1 hour and data are reported in **Appendix B3**. An 800 g split of each sample was air dried and archived at GSC Ottawa. Methods reported here are described in detail in the GSC Sedimentology Lab Manual (Girard et al. 2004).

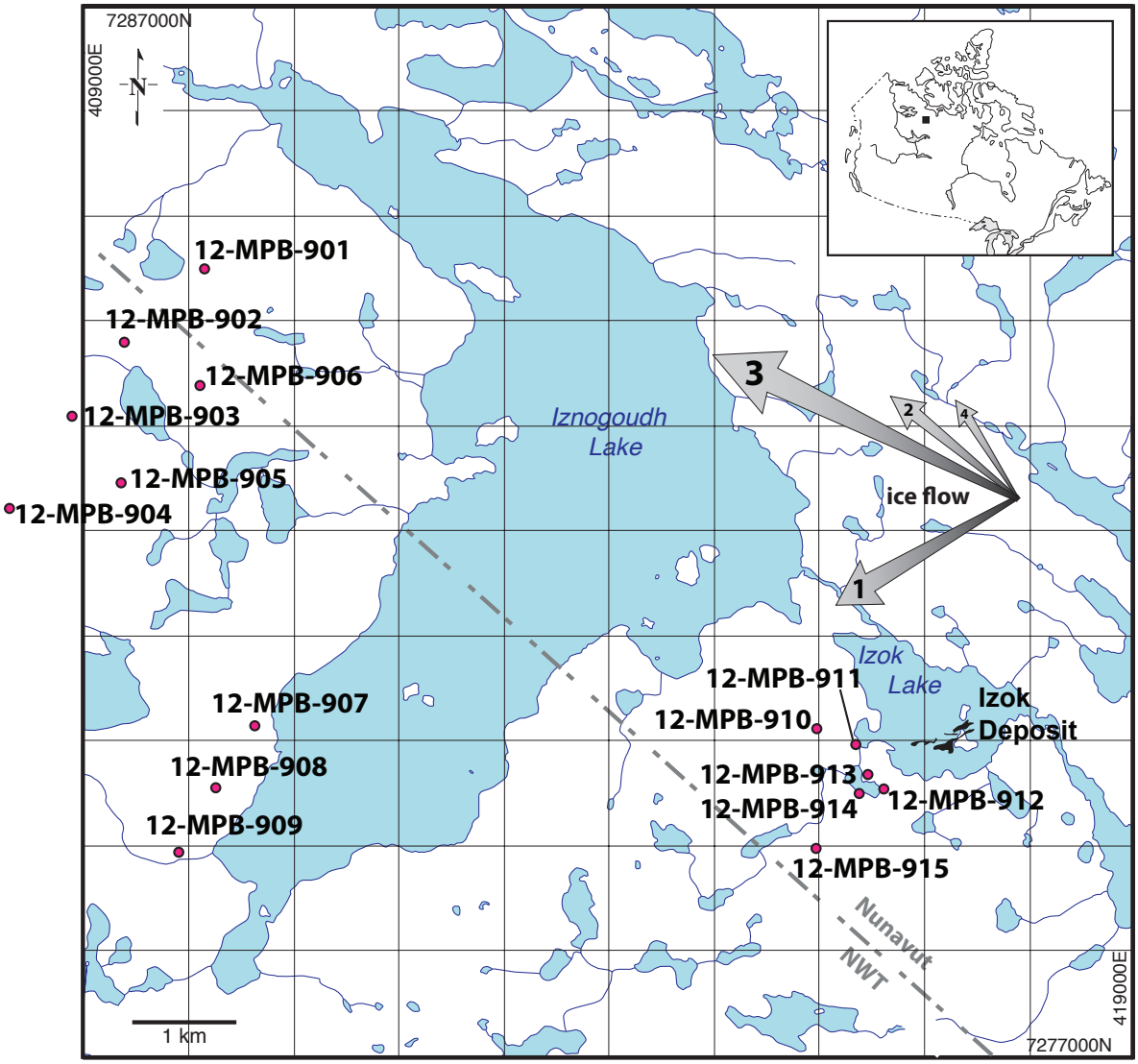

Figure 1. Location of the Izok Lake VMS deposit and the 15 till samples collected in 2012 around the deposit. Ice flow indicates relative erosional strength (1 = oldest, 4 = youngest) from Paulen et al. (2013).

Geochemical Analysis

Till samples were air dried and sieved at the GSC Sedimentology Laboratory and submitted to ACME Analytical Laboratories, Vancouver for geochemical analysis on the <0.063 mm fraction (till matrix). Major oxides and several minor elements were determined by lithium meta/tetraborate fusion ICP-MS (ACME Group 4A-4B method). The aliquot weight for borate fusion ICP-MS is 0.2 g sample in a 1.5 g flux. These data are reported in **Appendix** C1. A separate 1 g aliquot for each sample was digested in aqua regia and analyzed by ICP-MS to determine base and precious metals (ACME Group 1F method). These data are also reported in **Appendix C1**.

The digital data reported by ACME for the 2012 samples consists of two worksheets for the batch. The analytical results are reported in the "Analytical Data" sheet. One CANMET certified reference standard, TILL-4 (https://www.nrcan.gc.ca/mining-materials/certified-reference-materials/certificate-price-list/8137), was inserted by the GSC Sedimentology Lab (12-MPB-

914A) and one silica sand blank was inserted into the sample batch (12-MPB-913A). ACME reference standards and ACME blanks were also analyzed with the Izok Lake till samples. Analytical data for ACME's internal blanks and duplicates are listed in **Appendix C1**, in the "QC Data" worksheet. Analytical data and xy scatter plots for GSC quality control samples are reported in **Appendix C2**. The 2012 Izok Lake till samples were analyzed along with till samples from the Mount Pleasant Sn-W deposit area (McClenaghan et al., 2015) and are thus part of one larger batch of 48 samples. As a result, some of the QA-QC data reported in Appendix C1 and C2 are for the entire batch and not just for the Izok Lake samples.

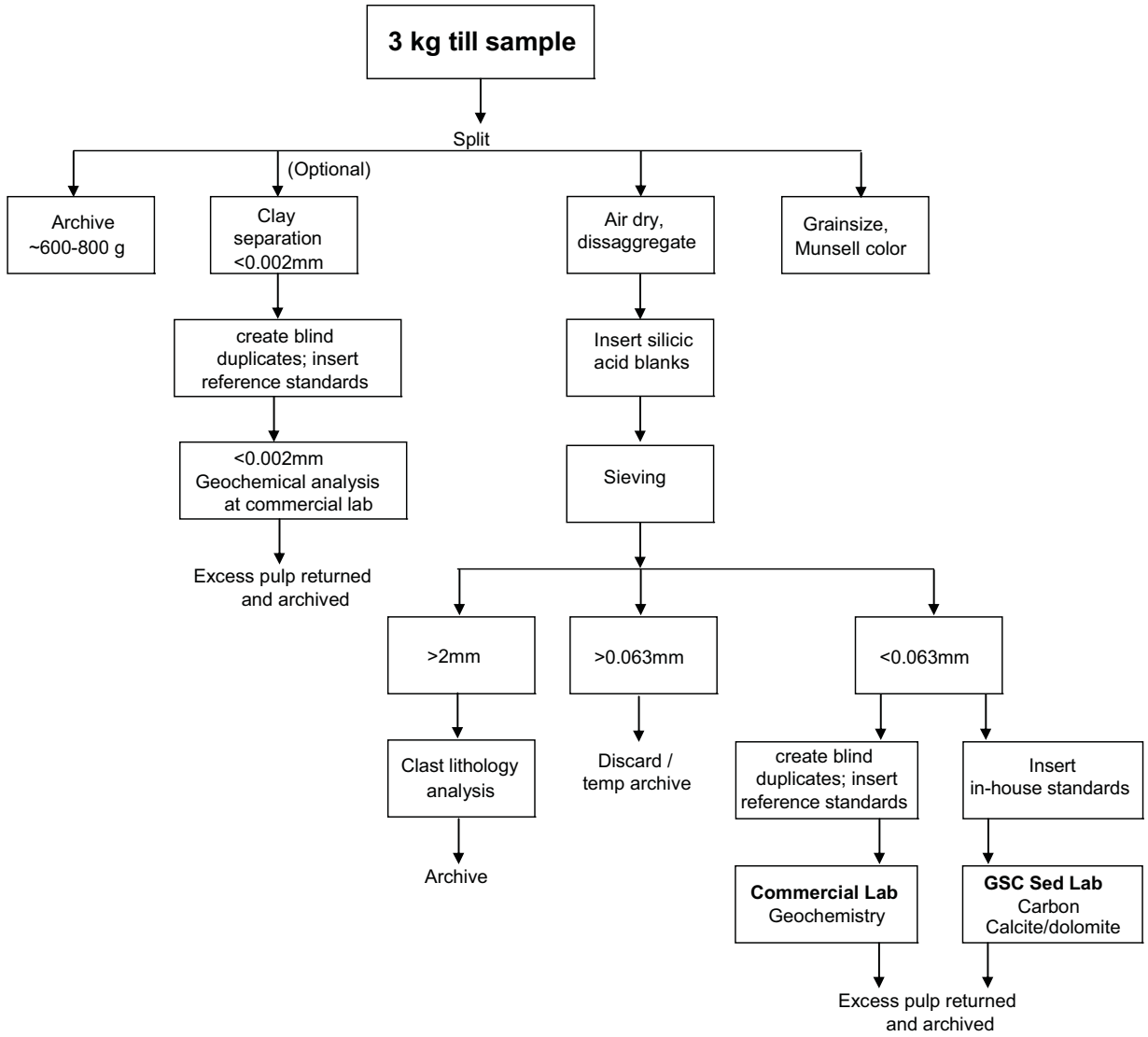

Figure 2. Flow sheet outlining the processing of the 2012 Izok Lake till samples in the GSC's Sedimentology Laboratory.

ACKNOWLEDGMENTS

The Izok Lake study was conducted as part of the Geological Survey of Canada's Geo-mapping for Energy and Minerals (GEM) Program (2008-2013). This case study is a collaborative

research effort between the Geological Survey of Canada, Minerals and Metals Group (MMG) and Queen's University. MMG is thanked for providing access to the property, till sampling in 2010 and 2012, logistical support and confidential geological information about the Izok Lake deposit.

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