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These data accompany:

**Open File Report 6259, Results of Regional Till Sampling in the Cobalt–New Liskeard–Englehart Areas, Northern Ontario**

These data are associated with the following publications:

**Baker, C.L., Gao, C. and Perttunen, M. 2010. Quaternary geology of the Cobalt area, northern Ontario; Ontario Geological Survey, Map 2685, scale 1:50 000.**

**Gao, C. 2010a. Quaternary geology of the Englehart area, northern Ontario; Ontario Geological Survey, Map 2661, scale 1:50 000.**

**Gao, C. 2010b. Quaternary geology of the New Liskeard area, northern Ontario; Ontario Geological Survey, Map 2657, scale 1:50 000.**

**Guindon, D.L. and Reid, J.L. 2005. Regional modern alluvium sampling of the Kirkland Lake–Matachewan area, northeastern Ontario; Ontario Geological Survey, Open File Report 6124, 121p.**

**Reid, J.L. 2002. Regional modern alluvium sampling survey of the Mattawa–Cobalt corridor, northeastern Ontario; Ontario Geological Survey, Open File Report 6088, 235p.**

**Reid, J.L. 2004. Regional modern alluvium sampling survey of the Cobalt–Elk Lake area, northeastern Ontario; Ontario Geological Survey, Open File Report 6119, 140p.**

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Miscellaneous Release—Data 284

**Till Sample and Indicator Mineral Data for the Cobalt, New Liskeard and Englehart Areas, Northern Ontario**

by C. Gao

This publication can be downloaded from

[http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm\\_dir.asp?type=pub&id=MRD284](http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD284)

## Description

This release presents the results of a regional till sampling and surficial mapping project undertaken in the Cobalt, New Liskeard and Englehart areas in northern Ontario between 2007 and 2009. The results consist of geochemical and compositional data of kimberlite indicator minerals (KIMs), metamorphic/magmatic massive sulphide indicator minerals (MMSIM<sup>®1</sup>) and gold grains recovered from till and glaciofluvial sand and gravel samples. The data are being released in conjunction with Open File Report 6259, available separately. Files in this release contain information on sample site locations; a list of abbreviations; sample processing data; KIMs picked and picking remarks; microprobe analyses of KIMs; gold grain data; MMSIM<sup>®</sup> data; pebble lithology data; and adjusted KIM and MMSIM<sup>®</sup> results. The data are available on 1 CD.

The Microsoft<sup>®</sup> Excel<sup>®</sup> (.xls) spreadsheets provided in this data release comprise all of the data collected in the study described in OFR 6259, which is available separately and contains only a small collection of the data that is included in this CD. The Appendix numbering in this release is consistent with the data description and interpretation in OFR 6259.

## MRD284 Contents

Appendix\_1\_sample locations\_UTMS.xls

Appendix\_2\_tabling data.xls

Appendix\_3\_gold summary.xls

Appendix\_4\_gold details.xls

Appendix\_5\_HMC for KIMs.xls

Appendix\_6\_KIM counts.xls

Appendix\_7\_KIM remarks.xls

Appendix\_8\_KIM microprobedata.xls

Appendix\_9\_adjusted KIMs.xls

Appendix\_10\_MMSIM counts.xls

Appendix\_11\_MMSIM remarks.xls

Appendix\_12\_adjusted MMSIMs.xls

## Description of the files

### **Appendix 1.** Sample Site Locations (Appendix\_1\_sample locations\_UTMS.xls)

This file contains information regarding sample locations in UTM co-ordinates in Zone 17 North American Datum 1983 (NAD83).

### **Appendix 2.** Tabling Data (Appendix\_2\_tabling data.xls)

This file contains information on the distribution and description of the sediments following the initial separation by wet sieving to remove the >2 mm fraction followed by gravity tabling to isolate the <2 mm fraction.

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<sup>1</sup> MMSIM is a registered trademark of Overburden Drilling Management Limited, Nepean, Ontario.

Abbreviations in the sediment log:

Largest Clast Present (Size)

G: Granules  
P: Pebbles  
C: Cobbles

Matrix Grain Size Distribution:

S/U: Sorted or Unsorted  
SD: Sand (F: Fine; M: Medium; C: Coarse)  
ST: Silt  
CY: Clay  
Y: Fraction present  
+: Fraction more abundant than normal  
-: Fraction less abundant than normal  
N: Fraction not present

Matrix Organics:

ORG: Y: Organics present in matrix  
N: Organics absent or negligible in matrix  
+: Matrix is mainly organic

Clast Composition:

V/S: Volcanic and/or sediments  
GR: Granitic  
LS: Limestone, carbonate  
OT: Other Lithologies (refer to footnotes)  
TR: Only trace present  
NA: Not applicable  
OX: Very oxidized, undifferentiated

Matrix Colour:

Primary:

BE: Beige  
GY: Grey  
GB: Grey-beige  
GN: Green  
GG: Grey-green  
PP: Purple  
PK: Pink

Secondary (soil):

OC: Ochre  
BN: Brown  
BK: Black

Secondary Colour Modifier:

L: Light  
M: Medium  
D: Dark

Footnotes:

\*Clasts listed as "other" are quartzite.

\*\*Based on bagged samples. For actual lithology, refer to Appendix 1

Most sand and gravel (and few till) samples were pre-screened to <3.5 mm in the field.

**Appendix 3.** Summary of Gold Grain Counts (Appendix\_3\_gold summary.xls)

This file contains the description and counts of gold grains collected during the tabling phase of sample processing for heavy mineral concentrates.

Abbreviations:

HMC: Heavy mineral concentrate

PPB: Parts per billion

**Appendix 4.** Details on Gold Grains (Appendix\_4\_gold details.xls)

This file contains a description of the characteristics and number of gold grains in the heavy mineral concentrate.

Abbreviations:

VG: Visible gold grains

M: Actual measured thickness of grain (microns).

C: Thickness of grain (microns) calculated from measured width and length

HMC: Heavy mineral concentrate

**Appendix 5.** Heavy Mineral Concentrates for KIM Picking (Appendix\_5\_HMC for KIMs.xls)

This file contains the weight distribution (grams) of the various size fractions (mm) obtained from the heavy mineral concentrate during sample processing.

**Appendix 6.** Summary of KIM Counts (Appendix\_6\_KIM counts.xls)

This file tabulates the distribution of KIM and selected pseudo-KIM counts (number of minerals) in each size fraction: 0.25 to 0.50 mm, 0.50 to 1.0 mm and 1.0 to 2.0 mm.

Abbreviations:

CR: Chromite.

DC: Cr-diopside; distinctly emerald green (paler emerald green low-Cr diopside picked separately).

FO: Forsterite

GO: Orange mantle garnet, which includes both eclogitic pyrope-almandine (G3) and Cr-poor megacrystic pyrope (G1/G2) varieties and may include unchecked (by SEM) grains of common crustal garnet.

GP: Purple to red peridotitic garnet (G9/10 Cr-pyrope)

IM: Mg-ilmenite, which may include unchecked (by SEM) grains of common crustal ilmenite lacking diagnostic inclusions or crystal faces

SEM: Scanning Electronic Microscope

**Appendix 7.** KIM Grain Picking Remarks (Appendix\_7\_KIM remarks.xls)

This file is a compilation of remarks made during the picking of kimberlite indicator mineral (KIM) grains for the 0.25 mm to 2 mm size fractions of processed samples.

Abbreviations:

CR: Chromite

DC: Cr-diopside; distinctly emerald green (paler emerald green low-Cr diopside picked separately).

FO: Forsterite

GO: Orange mantle garnet, which includes both eclogitic pyrope-almandine (G3) and Cr-poor megacrystic pyrope (G1/G2) varieties and may include unchecked (by SEM) grains of common crustal garnet

GP: Purple to red peridotitic garnet (G9/10 Cr-pyrope)

IM: Mg-ilmenite, which may include unchecked (by SEM) grains of common crustal ilmenite lacking diagnostic inclusions or crystal faces

SEM: Scanning Electronic Microscope

\*Most sand and gravel (and few till) samples pre-screened to <3.5 mm in the field.

#### **Appendix 8.** Microprobe Data for KIM Grains (Appendix\_8\_KIM microprobedata.xls)

This file is a compilation of geochemical data from microprobe analysis of the kimberlite indicator minerals.

Abbreviations:

CR: Chromite

DI: Diamondiferous (garnets)

DC: Cr-diopside; distinctly emerald green (paler emerald green low-Cr diopside picked separately).

FO: Forsterite

GO: Orange mantle garnet, which includes both eclogitic pyrope-almandine (G3) and Cr-poor megacrystic pyrope (G1/G2) varieties and may include unchecked (by SEM) grains of common crustal garnet

GP: Purple to red peridotitic garnet (G9/10 Cr-pyrope)

IM: Mg-ilmenite, which may include unchecked (by SEM) grains of common crustal ilmenite lacking diagnostic inclusions or crystal faces

SEM: Scanning Electronic Microscope

Footnotes:

All concentrations are reported as wt%.

\* Total Fe reported as FeO (There may be significant Fe<sub>2</sub>O<sub>3</sub> concentrations in some minerals)

#### **Appendix 9.** Summary of adjusted KIM Counts (Appendix\_9\_adjusted KIMs.xls)

This file summarizes the adjusted KIM counts for the 0.25 to 2.0 mm size fraction and gives sample calculations.

Abbreviations:

CR: Chromite.

DC: Cr-diopside; distinctly emerald green (paler emerald green low-Cr diopside picked separately).

FO: Forsterite

GO: Orange mantle garnet, which includes both eclogitic pyrope-almandine (G3) and Cr-poor megacrystic pyrope (G1/G2) varieties and may include unchecked (by SEM) grains of common crustal garnet

GP: Purple to red peridotitic garnet (G9/10 Cr-pyrope)

IM: Mg-ilmenite, which may include unchecked (by SEM) grains of common crustal ilmenite lacking diagnostic inclusions or crystal faces

SEM: Scanning Electronic Microscope

#### **Appendix 10.** Summary of MMSIM<sup>®</sup> Counts (Appendix\_10\_MMSIM counts.xls)

This file summarizes the MMSIM<sup>®</sup> counts for the 0.25 to 0.5 mm size fraction.

Abbreviations

Adr: Andradite

Mz: Monazite

Ap: Apatite

Ol: Olivine

Ase: Anatase

Opx: Orthopyroxene

Cpy: Chalcopyrite  
Cr: Chromite  
Crd: Corundum  
Fay: Fayalite  
Gh: Gahnite  
Gr: Grossular  
Gth: Goethite  
Ky: Kyanite

Py: Pyrite  
Sil: Sillimanite  
Sph: Sapphirine  
Spi: Spinel  
Sps: Spessartine  
St: Staurolite  
Tm: Tourmaline  
Ttn: Titanite

gr: grain  
N/A: Not available  
Tr: Trace

#### Notes

The samples are compartmentalized by paramagnetic separation from most paramagnetic to non-magnetic heavy minerals. The >1 amp is the fraction containing the least and non-magnetic heavy minerals. The <0.8 or <1 amp contains the moderate and most paramagnetic heavy minerals.

#### **Appendix 11.** MMSIM<sup>®</sup> Grain Picking Remarks (Appendix\_11\_MMSIM remarks.xls)

This file is a compilation of remarks made during the picking of metamorphic/magmatic massive sulphide indicator mineral (MMSIM<sup>®</sup>) grains for the 0.25 mm to 1 mm size fractions of processed samples.

#### Abbreviations

Cr: Chromian  
SEM: Scanning Electronic Microscope

#### Notes

When the heavy mineral assemblages are established on the list, in order of prominence, minerals comprising ≥15-20 percent of the 0.25-0.5 mm paramagnetic (<0.8 amp) fraction are followed by minerals comprising ≥15-20 percent of the corresponding non-paramagnetic (>1.0 amp) fraction. For example, the assemblage almandine-hornblende/diopside-titanite means almandine > hornblende >15% in the paramagnetic fraction and diopside > titanite >15% in the non-paramagnetic fraction.

#### **Appendix 12.** MMSIM<sup>®</sup> Data Adjusted and Converted Numerically (Appendix\_12\_adjusted MMSIMs.xls)

This file summarizes the adjusted MMSIM<sup>®</sup> counts and describes the numerical conversion.

#### Abbreviations

Adr: Andradite  
Ap: Apatite  
Ase: Anatase  
Cpy: Chalcopyrite  
Cr: Chromite  
Fay: Fayalite  
Gr: Grossular  
Gth: Goethite  
Ky: Kyanite

Mz: Monazite  
Ol: Olivine  
Opx: Orthopyroxene  
Py: Pyrite  
Sil: Sillimanite  
Spi: Spinel  
Sps: Spessartine  
St: Staurolite  
Tm: Tourmaline  
Ttn: Titanite

gr: grain  
N/A: Not available  
Tr: Trace

#### Numerical conversion:

MMSIM<sup>®</sup> grains were reported as either actual grain counts, e.g., gahnite, as a percentage of a particular grain size, e.g., staurolite, or as “trace” amounts, e.g., kyanite. To show the data numerically, where an MMSIM<sup>®</sup> was reported as “trace”, a value representing one-half the lowest recorded value in percentage was applied (0.25).

#### Reference

Morris, T.F., Sage, R.P. Crabtree, D.C. and Pitre, S.A. 2000. Kimberlite, base metal, gold and carbonatite exploration targets, derived from overburden heavy mineral data, Killala Lake area, northwestern Ontario; Ontario Geological Survey, Open File Report 6013, 107p.