

## **Compilation of reanalyses and new analyses of lithogeochemistry - Abitibi greenstone belt, Ontario and Quebec**

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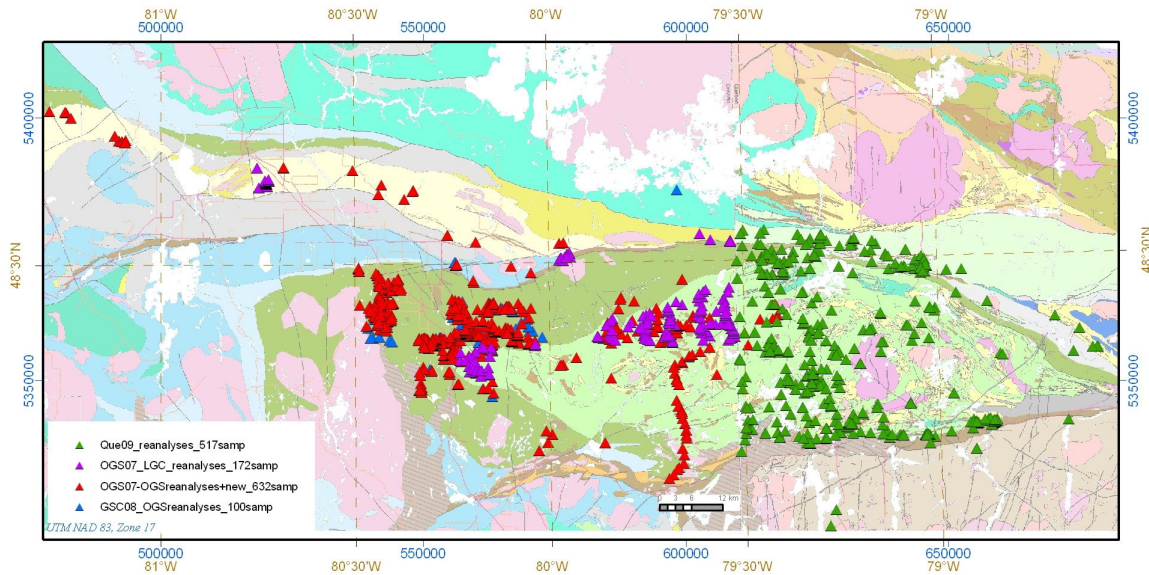
The provinces of Ontario and Québec have collected and analysed thousands of rock samples in the Abitibi area over the past 50 years. This analytical data is stored in large lithogeochemical databases: Ontario's LGC (accessible from [http://www.mndm.gov.on.ca/mndm/mines/geologyontario/default\\_e.asp](http://www.mndm.gov.on.ca/mndm/mines/geologyontario/default_e.asp).) and Quebec's SIGEOM (accessible from <http://www.mrn.gouv.qc.ca/english/mines/index.jsp>). However, information about the analytical techniques that were used on the samples, which is necessary for detailed geochemical data interpretation, has not been consistently retained in these databases.

To establish a collection of high quality major and trace element analyses for studies related to massive sulphide mineralization, a compilation of new lithogeochemical data in the Blake River Group was undertaken from 2007 to 2009 as part of the TGI-3 Abitibi initiative. A suite of samples derived from the LGC and SIGEOM databases in Ontario and Quebec were identified for additional chemical analysis including Fe+2, CO<sub>2</sub>, H<sub>2</sub>O+ and REE elements. Hand samples were obtained from: a) the former Kirkland Lake Drill Core Library, b) drill core from Timmins and c) field sampling in 2007. Additional pulps were obtained from the Ontario Geological Survey and Le ministère des Ressources naturelles et de la Faune.

In total, this project selected and analyzed 1,421 samples from the Abitibi greenstone belt from 2007 to 2009.

- a) In early 2007, 172 samples from the OGS LGC legacy stockpile were chosen and submitted to OGS Labs for new major, minor and rare earth element analysis.
- b) In summer 2007, 113 new samples were collected from outcrop and drillcore, and a further 519 were selected from the OGS LGC legacy stockpile, and submitted to OGS Labs in late 2007 for new major, minor and rare earth element analysis.
- c) In spring 2008, a further 100 samples were selected from the OGS legacy stockpile and submitted to the GSC Labs for new major, minor and rare earth element analysis.
- d) Finally, in 2009, 517 legacy samples from the collection at the GSC Québec office were sent to ACME Labs in Vancouver for new minor and rare earth element analysis.

The samples were analyzed for (Si, Al, Fe+3, Mg, Ca, Na, K, Ti, P, Mn) using X-ray Fluorescence (XRF) on fused pellets. Fe+2, CO<sub>2</sub>, H<sub>2</sub>O+, S rare earth elements (La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Yb, Lu) and additional trace elements (Ba, Be, Bi, Cd, Co, Cr, Cs, Cu, Ga, Hf, Li, Mo, Nb, Ni, Pb, Rb, Sb, Sc, Sn, Sr, Ta, Th, Ti, Tl, Tm, U, V, W, Y, Zn, Zr). These samples are shown in the figure below.



On the CD, the geochemical data is delivered in flat (Excel) files with location and analytical results, and also as ESRI shape files for GIS-based applications. The data is presented in ArcGIS format with an Abitibi geology (raster) basemap adapted from Ayer et al, 2004 and unpublished GSC (Quebec) data.

Discussions of the interim results have been presented by Ayer et al. (2006, 2007), Grunsky (2008), Hillary et al. (2008), and Ross et al. (2009).

NOTE : Image of geological base map compiled by K. Lauzière (Geological Survey of Canada) from:

- 1) Ontario Geological Survey, 2005: Architecture Project in the Timmins-Kirkland Lake region: Discover Abitibi Initiative, Ontario Geological Survey, Miscellaneous Release – Data 155.
- 2) Lamothe, D., Harris, J.R., Labbé, J.-Y., Doucet, P., Houle, P., Moorhead, J., Dion, C., Savard, R. et Melançon, M., 2005 : Evaluation du potentiel en minéralisations de type sulfures massifs volcanogènes (SMV) pour l'Abitibi, Ministère des Ressources naturelles, de la Faune et des Parcs; EP 2005-01.

## References:

Ayer, J.A., Trowell, N.F. and Josey, S. 2004. Geological compilation of the Abitibi greenstone belt; Ontario Geological Survey, Miscellaneous Release Data 143, 1 CD.

Ayer, J A; Dubé, B; Goodfellow, W D; Ross, P -S; Bleeker, W; Taylor, B E; Peter, J M; Grunsky, E C; Hillary, B; Thurston, P C; Berger, B R; Houlé, M G; Beakhouse, G P; Trowell, N F; Snyder, D B; McNicoll, V J; Keating, P; Percival, J A; Mercier-Langevin, P; Lauzière, K; Paradis, S J; Goutier, J; Dion, C; Pilote, P; Legault, M; Monecke, T; Dumont, R; Brouillette, P; Gosselin, P; van Breemen, O; 2006. Project unit 05-024. The

Abitibi Subprovince: an update on the goals and preliminary results of the Precambrian Geoscience Section, Targeted Geoscience Initiative III and Deep Search projects; *in*, Summary of field work and other activities 2006; Ontario Geological Survey, Open File Report 6192, 2006; p. 4-1 to 4-19

Ayer, J.A., Dubé, B., Goodfellow, W.D., Ross, P.-S., Bleeker, W., Taylor, B.E., Peter, J.M., Grunsky, E.C., Hillary, B., Thurston, P.C., Berger, B.R., Houlié, M.G., Beakhouse, G.P., Trowell, N.F., Snyder, D.B., McNicoll, V.J., Keating, P., Percival, J.A., Mercier-Langevin, P., Lauzière, K., Paradis, S.J., Goutier, J., Dion, C., Pilote, P., Legault, M., Monecke, T., Dumont, R., Brouillette, P., Gosselin, P. and Van Breemen, O., 2007. The Abitibi greenstone belt: update of the Precambrian Geoscience Section program, the Targeted Geoscience initiative III Abitibi and Deep Search projects; *in* Summary of Field Work and Other Activities 2007, Ontario Geological Survey, Open File Report 6213, p.3-1 to 3-44.

Grunsky, E.C., 2008. Lithogeochemical compilation and interpretation in Ontario/Quebec; *in* Summary of Field Work and Other Activities, 2008; (ed.) C.L. Baker, E.J. Debicki, R.I. Kelly, J.A. Ayer and G.M. Stott, Ontario Geological Survey, Open File Report 6226, 374p.

Hillary, E.M., Grunsky, E.C., Adcock, S.W., 2008. Compilation of lithogeochemistry - Abitibi greenstone belt - Ontario portion; Geological Survey of Canada Open File 5510, 1 CD-ROM containing a database in .mdb format, data in .xls and .txt formats, a GIS data set in .shp format, and a map in .pdf format. ESRI® ArcExplorer™ Java v. 1.0 is also included on this CD-ROM.

Ross, P.-S., Goutier, J., Mercier-Langevin, P., Percival, J., Legault, M., Grunsky, E., Dubé, B., et Dion, C., 2009. Roches volcanoclastiques mafiques à intermédiaires du Groupe de Blake River : implications pour l'architecture volcanique et l'exploration des SMV; Cuivre 2009, Noranda, Quebec, 2009.