

by D.C. Peck

Peck, D.C. 1999: The Thompson Nickel Belt project: synopsis of activities (parts of NTS 63J, 63O, 63P); in Report of Activities 1999, Manitoba Industry, Trade and Mines, Geological Services, p. 13.

### SUMMARY

The Thompson Nickel Belt (TNB) project is a collaborative, exploration-supportive research program that involves five mining industry sponsor companies (INCO Limited, Falconbridge Limited, Hudson Bay Exploration and Development (HBED), WMC International Limited and Billiton). The research program is led by Manitoba Energy and Mines staff and scientists from the University of Manitoba, Laurentian University's Mineral Exploration Research Centre, the Université du Québec à Montréal, the University of Alberta, the University of Saskatchewan and the Geological Survey of Canada. Administration for the project is provided by the Canadian Mining Industry Research Organization (CAMIRO). Much of the project research is being carried out by two post-doctoral researchers (O.M. Burnham, Laurentian University, and A. Potrel, Université du Québec à Montréal) and 4 graduate research students (J. Liwanag, University of Manitoba; D. Layton-Matthews, Laurentian University; D. Michalak, University of Alberta; and, K. Toope, University of Alberta).

### CURRENT ACTIVITIES

Activity during the second year of the project, which ended in June, and field work completed during the 1999 field season (project year 3) principally focussed on the following aspects of TNB geology:

- 1) detailed mapping at Mystery Lake (see Theyer, Peck and Freund, GS-7, this volume; area A, Fig. GS-3-1) along the western boundary of the TNB between the Soab mines and the Pipe Mine (area B, Fig. GS-3-1) and in the northern part of the Setting Lake area (see Zwanzig, GS-6, this volume; area C, Fig. GS-3-1);
- 2) regional structural geology investigations (A. Potrel, Université du Québec à Montréal);
- 3) additional sampling of Ni sulphide ore bodies, mafic and ultramafic rocks, Ospwagan Group metasedimentary rocks and basement gneisses from drill core, surface outcrops and underground exposures (INCO Limited's Thompson and Birchtree Mines) in support of ongoing whole-rock geochemistry and ore mineralogy and geochemistry investigations;
- 4) completion of most of the planned whole-rock geochemical analyses (Central Analytical Facility, Laurentian University, and the Geoscience Laboratories, Ontario Ministry of Northern Development and Mines, Sudbury, Ontario) of mafic, ultramafic and metasedimentary rock samples obtained from company drill core and surface outcrops;
- 5) extensive sampling of basement gneisses and felsic to intermediate intrusive rocks in the exposed part of TNB for U-Pb geochronology;
- 6) completion of preliminary U-Pb age determinations for detrital zircons obtained from all of the major metasedimentary rock sequences in the TNB;
- 7) continued development of the project GIS database, now capable of accepting all digital databases acquired during the remainder of the project, and presently including most of the available project sample locations and whole-rock geochemical data, a seamless topographic base and two regional scale geological map bases; and
- 8) completion of an initial set of whole-rock Nd-Sm isotope analyses for mafic and ultramafic rocks in the TNB.

During the remainder of project year 3, high precision U-Pb zircon, baddeleyite and, possibly, monazite geochronological analyses will be completed on selected samples collected during the 1999 field season. In addition, the remaining, planned whole-rock trace and Sm-Nd isotopic analyses will be completed. During the final year of the project (June 2000 - May 2001) work will focus on the interpretation of all project results, leading to the development of new exploration guidelines and regional magmatic and tectonic models. The large amount of geochronological data that will be generated over the next two years will, when integrated with field observations and the soon to be released geological compilation

maps (see Macek et al., GS-4, this volume), provide new constraints on the structural evolution of the TNB, the timing of peak metamorphism, the age of the Ni sulphide ore bodies and the age of mafic and ultramafic magmatism in the TNB. Ongoing litho-geochemical, ore mineralogy and GIS analyses will focus on developing new ore genesis models and exploration criteria.

The project is on schedule to meet its principal objectives by the end of project year 4. Data gathered during the TNB project will remain confidential for 1 to 2 years following initial reporting to the industry sponsors. Once the confidentiality period has expired for a specific data set, researchers can publish this data together with their interpretations. Manitoba Energy and Mines will soon begin to prepare a digital version of the project GIS database (on CD-ROM) that will be released to the public following expiration of all relevant confidentiality periods. TNB project researchers are currently investigating the most effective means of public disclosure of project results.

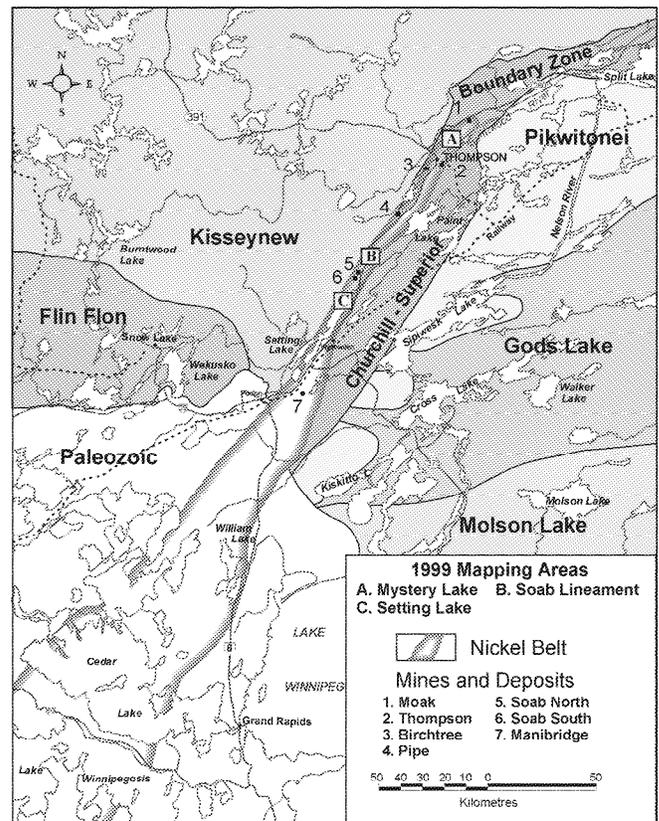
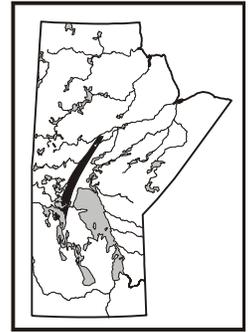


Figure GS-3-1: Geological setting of the Thompson Nickel Belt, north-central Manitoba, showing locations for detailed mapping projects completed in 1999.

### ACKNOWLEDGEMENTS

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