

**Minnesota Geological Survey
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**Geochemical data from Phase 2 of the study
GEOLOGY, GEOCHEMISTRY, AND PGE POTENTIAL
OF MAFIC-ULTRAMAFIC INTRUSIONS IN MINNESOTA,
EXCLUDING THE DULUTH COMPLEX**

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This open-file contains data from the first and second phase of a 3-year study to evaluate platinum group element potential in mafic-ultramafic intrusions throughout Minnesota, excluding the Duluth Complex. Specifically, it reports the results of geochemical analyses conducted on 20 intrusions selected from more than 150 that were inventoried during the first phase of the study released in 2003. The study was funded over 2 biennia by the Minerals Diversification Program of the Minnesota Legislature on recommendation of the Minerals Coordinating Committee. This readme details the information available under the Phase 2 designation.

- 1) **PGM2geochem.xls**—a data table containing the results of more than 600 geochemical analyses from 19 intrusions from various geologic terranes state-wide (100 analyses were obtained for this study, 84 of those are new in phase 2);
- 2) **DL2geochem.xls**—a data table containing results of 254 geochemical analyses from the Archean Deer Lake Complex (138 were obtained for this study, 47 are new in phase 2);
- 3) **PGM2_map.pdf**—a map showing the location and generalized geologic setting of those intrusions about which something is known from outcrop or drill core, and naming those described in this report;
- 4) This **PGM2text.doc** document.

Intrusions of the Phase 2 study (drill hole numbers shown in parentheses):

Archean Wabigoon subprovince

- 1) Winterfire (R2-1, R2-2, WF-1, WF-4)
- 2) Black River (A-1-1)
- 3) Oaks (B21-3)
- 4) West Oaks (B5-1)
- 5) Warroad (BD-1); Warroad N (YW13-1), Warroad E (YWA-4)
- 6) Grygla (Star-3)
- 7) Strathcona (SC-1)

Archean Wawa subprovince

- 8) *Deer Lake Complex*
- 9) Linden (LP-1)
- 10) Mizpah (MIZ-A1)
- 11) Saum (RL-39)
- 12) Ana (ANA-1)
- 13) O'Brian Creek (RL-29)
- 14) Mentor (L2, L3, L4)

Archean Minnesota River Valley subprovince and Paleoproterozoic Penokean Orogen

- 15) Washington (NB-81-1)
- 16) Meeker BKV (BKV-81-1)
- 17) Meeker LL (LL-81-1)
- 18) Providence (ML-1)
- Paleoproterozoic Yavapai Terrane (buried by thick Paleozoic strata in SE Minnesota)
- 19) Fillmore B1 (B1)
- 20) Fillmore BO (BO-1)

Analyses shown on these tabulations were obtained from drill core acquired largely by exploration companies and maintained in the Drill Core Library of the Department of Natural Resources (DNR), Division of Lands and Minerals, Hibbing, Minnesota; and from outcrop sampling. The data tables include analyses conducted for companies and agencies and archived in DNR files, and new analyses obtained specifically for this study—the latter are highlighted in both tables. The results from intrusions state-wide (**PGM2geochem.xls**) are subdivided by the geologic province or terrane in which they occur. The Deer Lake data (**DL2geochem.xls**) are divided into 3 composite "sampling traverses" from north to south (down-stratigraphic section) across the multiple, steeply dipping intrusions. These traverses are located generally in the western, central, and eastern parts of the complex.

A final report published in March, 2006, (OFR-06-03) contains these data in an integrated fashion, various geochemical plots, maps showing geologic and geophysical context, and discussions of PGE potential. A detailed geologic map of the Deer Lake Complex is available from the MGS as Miscellaneous Map M-165.

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(for overview of the study, geologic context, research results, and publications)

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