

# Volcanological and Structural Setting of Paleoproterozoic VMS and Gold Deposits at Snow Lake, Manitoba

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# GAC–MAC 2013: FIELD GUIDE SUMMARY

## Volcanological and Structural Setting of Paleoproterozoic VMS and Gold Deposits at Snow Lake, Manitoba

GAC–MAC Winnipeg 2013,  
pre-meeting field trip

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### FIELD TRIP OBJECTIVES

The juvenile 1.89 Ga oceanic arc volcanic rocks of the Paleoproterozoic Flin Flon volcanic belt are host to several world-class volcanogenic massive sulphide (VMS) deposits, including the recently discovered Au-rich Lalor Lake VMS deposit at Snow Lake (Fig. 1). This trip uses spectacular roadside outcrops (Figs. 2-5) to highlight current understanding of the nature and setting of the regionally metamorphosed VMS mineralization and alteration at the eastern end of the belt at Snow Lake. An underground tour of the just-opened Lalor Lake mine and a sur-



**Figure 1.** Aerial view of headframe and hoisthouse at Lalor Lake mine, November 2012.



**Figure 2.** 'Silicified' pillowed flow, Welch formation, lower Anderson sequence.



**Figure 3.** Epidiosite alteration domain with amphibole and quartz-feldspar rims overprinting a fragment with an albite-quartz altered rim in a heterolithic breccia bed of the Edwards formation, lower Chisel sequence

face tour of outcrops at the Snow Lake gold mine round out this trip. The excellent outcrop expo-

sure, large domains of hydrothermally altered rocks and abundant VMS deposits at Snow Lake make this area



**Figure 4.** A mafic synvolcanic dyke (upper left) with adjacent zones of pervasive and mottled albite and silica enrichment developed in bedded Edwards mafic wacke, lower Chisel sequence.



**Figure 5.** Symmetrical ripples, trough cross bedding in tidal-reworked mafic tuff of the Threehouse formation, upper Chisel sequence.

an important natural laboratory for applying modern volcanic massive sulphide theories to ancient deposits. The trip will be useful to researchers and explorationists interested in the volcanic architecture, hydrothermal evolution and metamorphism of a prolifically mineralized VMS terrane. The trip presents outcomes of projects conducted over the past two decades by the Manitoba Geological Survey and Natural Resources Canada (under MITEC, CAMIRO, Shield Margin NATMAP and TGI programs), Laurentian University (NSERC-supported research) and HudBay Minerals Inc.

#### OTHER INFORMATION

This excursion will visit readily accessible roadside exposures, with some short (<500 m) hikes on trails. Participants will meet at 12:00 noon, May 18<sup>th</sup>, 2013, at Winnipeg International Airport and travel to Snow Lake by van. Participants return to Winnipeg, arriving between 10 PM and 11 PM on Tuesday May 21<sup>st</sup>. Participants going underground at the Lalor Lake mine require fit testing for a respirator. They must be clean shaven to pass the respirator fit test, and without this test they will not be allowed underground.