

DESCRIPTIVE MODEL OF MERENSKY REEF PGE

By Norman J Page

SYNONYM Stratiform mafic-ultramafic PGE.

DESCRIPTION Disseminated PGE-rich sulfides in olivine-rich rocks in anorthosite-gabbro zone of large layered intrusions (see fig. 5).

GEOLOGICAL ENVIRONMENT

Rock Types Norite, gabbro-norite, dunite, harzburgite, peridotite, pyroxenite, troctolite, anorthosite, and gabbro.

Textures Cumulate textures; layers with gradational proportions of euhedral crystals; locally with poikilitic matrix.

Age Range Generally Precambrian, but may be as young as Tertiary.

Depositional Environment Intruded into granitic gneiss or into volcanic-sedimentary terrane.

Tectonic Setting(s) Cratonal, mostly in Precambrian shield areas.

Associated Deposit Types Stillwater Ni-Cu, Bushveld Cr, and Bushveld Fe-Ti-V. PGE placers.

DEPOSIT DESCRIPTION

Mineralogy Pyrrhotite + chalcopyrite + pentlandite ± chromite ± graphite. PGE minerals are. braggite, cooperite, kotulskite, vysotskite, sperrylite, moncheite, and alloys of platinum-group metals.

Texture/Structure Clots of massive sulfide and disseminated grains.

Alteration None related to ore.

Ore Controls In layers near first reappearance of olivine as a cumulate phase after thick accumulation of plagioclase pyroxene rocks. May be related to introduction of new magma. Locally associated with pipes of Fe-rich olivine.

Weathering Difficult to see ore zone on weathered surface, exploration requires extensive sampling and chemical analysis.

Geochemical Signature PGE, Cu, Ni, Cr, Ti. High Mg; low Na, K, P.

EXAMPLES

Bushveld Complex, SAFR	(Vermaak and Hendriks, 1976)
Stillwater Complex, USMT	(Todd and others, 1982)