DESCRIPTIVE MODEL OF STILLWATER Ni-Cu

By Norman J Page

APPROXIMATE SYNONYM Stratiform mafic-ultramafic Ni-Cu.

DESCRIPTION Ni, Cu sulfides at base of large repetitively layered mafic-ultramafic intrusion. (see fig. 5).

GENERAL REFERENCES Geological Society of South Africa, Special Publication 1 (1969); Economic Geology, v. 77, no. 6 (1982) and v. 71, no. 7 (1976).

GEOLOGICAL ENVIRONMENT

Rock Types Layered intrusion contains 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 volcanic-sedimentary terrane.

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

Associated Deposit Types Bushveld Cr, Merensky Reef PGE, Bushveld Fe-Ti-U. PGE placers.

DEPOSIT DESCRIPTION

Mineralogy Pyrrhotite + chalcopyrite + pentlandite + cobalt sulfides, by-product platinum group metals (PGE).

Texture/Structure Locally massive; interstitial to silicates; disseminated.

Alteration None related to ore.

Ore Controls Basins in basal contact of intrusion with rapidly varying lithologies. Sulfides may intrude fractures in footwall country rock. Ingress of sulfur through fractures in footwall may be important ore control.

Weathering Gossan.

Geochemical Signature Cu, Ni, PGE, CO. High Mg; low Na, K, and P.

EXAMPLES

Stillwater Complex, USMT (Page, 1977)

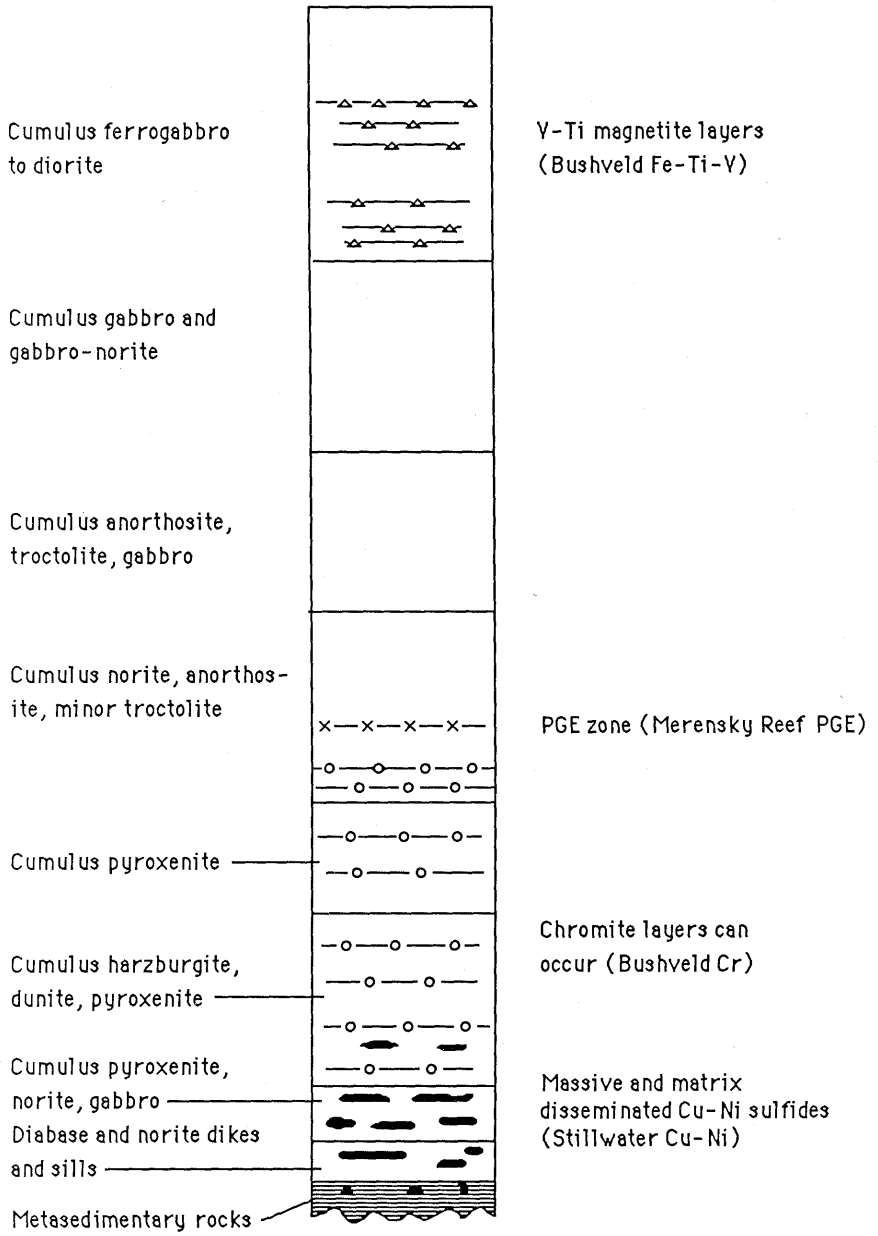

Figure 5. Diagram of typical mafic-ultramafic stratiform complex, 500 to 1,500 m thick, showing stratigraphic relations of rock units and mineral deposits. Deposit models shown in parentheses.