

LECTURE TWELVE: The Bushveld Complex

IN THIS LECTURE

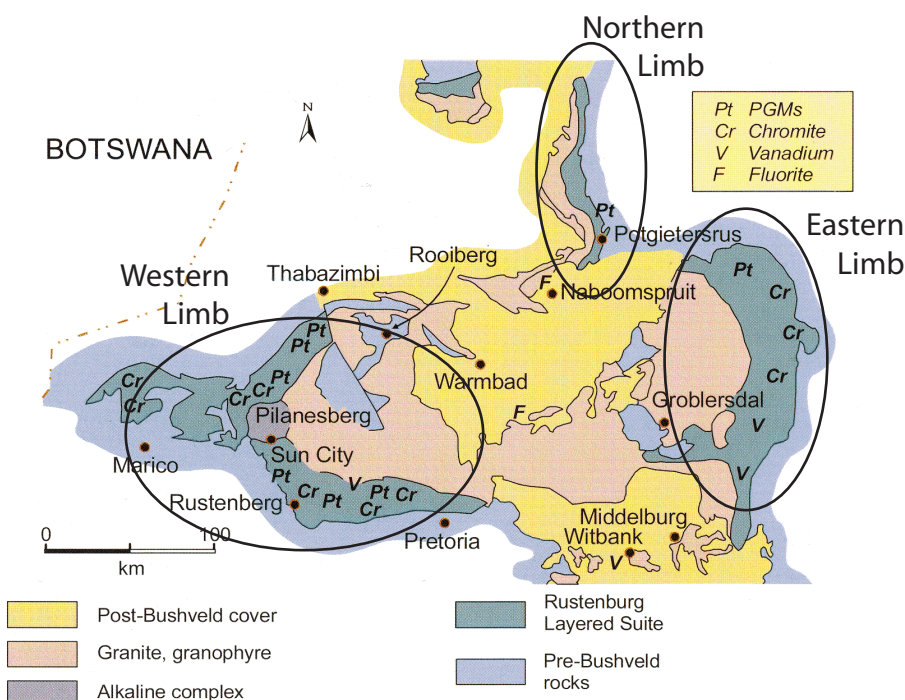
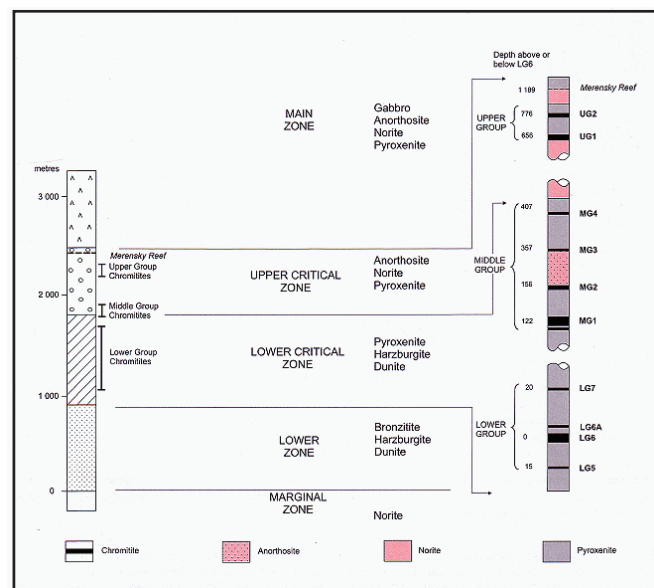
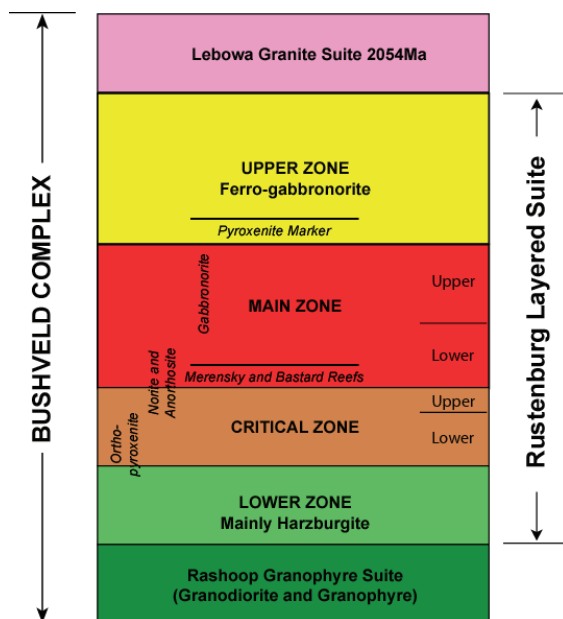
- Shield Volcanoes
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THE BUSHVELD COMPLEX - An Introduction

- The Bushveld Complex is located in South Africa, between the Limpopo and North West provinces and covers an area of approximately 66000 km²
- It consists of four groups of rocks: 1) the Rustenburg Layered suite (RLS) which is the largest and oldest mafic layered complex and covers an area of about 66,000 km²; 2) The Lebowa Granite Suite; 3) the Rasthoop granophyre suite which overlies the RLS; and 4) Various satellite intrusions of various compositions including the Molopo, Farms and Nkomati-Uitkomst

THE RUSTENBURG LAYERED SUITE

- The Rustenburg Layered Suite is comprised of mafic and ultramafic rocks and was emplaced into the shallow water sediments of the Transvaal Supergroup at 2053 Ma
- Traditionally the RLS is divided into five units (Cawthorn, 1996) namely the marginal, lower, critical, main and upper zones.
- In general the platinum bearing horizons, for which the Bushveld is best known, are the Merensky, UG2, and Plat Reefs. All three are located towards the top of the critical zone
- The RLS is divided into three limbs namely Western (Merensky and UG2 Reefs), Eastern (Merensky and UG2 Reefs), and Northern (Plat Reef)



The definition of the Merensky Reef, the world's richest PGE deposit is complicated. The following definition was given by Lee in 1996.

1. A plagioclase-bearing (feldspathic) orthopyroxenite, olivine orthopyroxenite, or harzburgite layer, located at the base of the Merensky unit, and enriched in economic amounts of base metal sulphide and platinum-group elements.
2. The texture is coarse-grained pegmatoidal, partly pegmatoidal or medium grained. Thin chromitite layers (two to four) are associated with the upper and lower limits of economic mineralization.
3. The Merensky Reef is conformably overlain by medium- to coarse-grained poikilitic feldspathic pyroxenite, constant in thickness.
4. The Merensky Reef is paraconformable to the uppermost units of the Critical Zone.
5. In the case where these units are plagioclase cumulates, the Merensky Reef may be directly underlain by an anorthosite, conformable with the Merensky Reef, and variable in thickness.