1. PROPONENT NAME
Nicolasen and Burger (1985 - "Bulls Run Syenitic Gneiss"); revised by present author (this publication).

2. DERIVATION OF NAME
The term Bulls Run Estate 12987, 17 km NNE of Eshowe, Natal.

3. TYPE AREA
Northeast of Goedertrou Dam (Fig. 1).

4. STRATIGRAPHIC POSITION AND AGE
Located within the Nkomo Nappe of the Tugela Group, near the northern margin of the Natal Metamorphic Province (Charlesworth, 1981). Intrusive into the Tugela Group. Nicolasen and Burger (1985) obtained a U-Pb age of 1140 ± 35 Ma from a single zircon. More recent work (author's unpublished whole-rock Rb-Sr data) indicates an age of 1138 ± 45 Ma for the nepheline syenite gneiss.

5. GEOLOGICAL DESCRIPTION

Bulls Run Estate (3G-50%), microcline (10-20%), quartz (2-6%) and aegirine-augite (2-5%). Calcite and riebeckite occur in accessory amounts.

Alkaline mafic gneiss (<1%): Fine-grained; dark grey to black. Consists of biotite (20-50%), albite (35-50%), microcline (2-15%), calcite (9-12%) and apatite (<3%).

Geochemistry: Muscovite syenite gneisses are silica-saturated (SiO₂: 52-59%), peraluminous and have moderate alkali contents (Na₂O/K₂O: 10-13%), with K₂O generally in excess of Na₂O. The nepheline syenite gneisses are undersaturated (SiO₂: 48-58%; normative nepheline: 10-30%), metaluminous to peraluminous and have elevated alkali contents (Na₂O+K₂O: 12-15%). Potassic and silica-rich in central and western outcrops (Na₂O/K₂O c. 0.75) but more sodic and undersaturated in the east (Na₂O/K₂O c. 1.25). Albite syenite gneisses have the highest silica contents of the major lithologies (SiO₂: 57-65%) and due to their sodic character (Na₂O/K₂O: 1-2.5) are moderately undersaturated (normative nepheline: 10-20%), FeO (<2%) and CaO (<1%) contents are low. Enrichment in trace elements such as Zr (700-2000 ppm) and Nb (200-16500 ppm) is diagnostic. Carbonatite gneisses have typical sōvite chemistry: CaO (30-55%), MgO (c. 0.5%), P₂O₅ (<6%), Sr (9000-9000 ppm), Nb (50-400 ppm). Peraluminous microsyenite gneisses are silica-saturated (SiO₂: 60-70%, normative quartz: 2-12%), sodic (Na₂O/K₂O c. 2) and mildly peraluminous (Na⁺K/Al c. 1.02). Alkaline mafic gneisses have high alkali contents (Na₂O+K₂O: 8-11%) for relatively low SiO₂ (45-50%); trace elements Zn, Nb, Zr, Bi, Sr, Ba, F, CO₃ and LREE are enriched and typical of nepheline or alkaline lamprophyre.

Genesis: The Bulls Run gneisses have many of the mineralogical and geochemical characteristics typical of nepheline syenite/ijolite carbonatite central complex magmatism. Nepheline syenite complexes are generally intruded into anorogenic or rifted continental settings, but minor occurrences have also been noted in within-plume oceanic settings. By analogy with undeformed complex-

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**CATALOGUE OF SOUTH AFRICAN LITHOSTRATIGRAPHIC UNITS**

**MokolIan**

**BULLS RUN COMPLEX**

A.J. Scogings

1st Edition: 1991

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Fig. 1 Distribution of the Bulls Run Complex and location of its type area.

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