Gypsum Deposits Associated with the Whitehill Formation (Ecca Group) in the Steytlerville-Jansenville Area, Southern Karoo, South Africa

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INTRODUCTION
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1950s Baroe Gypsum Mine

SA Lime Prospecting Area

PPC Mt Stewart Operating Mine
GYPSUM USES

Wallboard and Plaster Material

Toothpaste

Orthopedic Casts

Cement

Dentistry

Soil Additives
GYPSUM USES

Wallboard and Plaster Material

Toothpaste

Orthopedic Casts

Soil Additives

Gypsum
CaSO₄·2H₂O

Dentistry

Cement
STUDY AREA

After Rogers et al., 1991
STUDY AREA

Oosterhuis, 1998
WHITEHILL FORMATION

- Higher carbon content
- Shell deposits – \( \text{CaCO}_3 \) – calcium rich
- Higher pyrite content – \( \text{FeS}_2 \)
- Darker colour at depth
- Weathers white at the surface

After Cole and Basson, 1991
WHITEHILL FORMATION

- **Higher carbon content**
- **Shell deposits – CaCO₃ – calcium rich**
- **Higher pyrite content – FeS₂**
- **Darker colour at depth**
- **Weathers white at the surface**

After Cole and Basson, 1991
GYPSUM

CaCO₃ or CaMg(CO₃)₂

FeS₂

CaSO₄·2H₂O

In the presence of H₂O

Ca²⁺  Ca²⁺  Ca²⁺  Ca²⁺  Ca²⁺  SO₄²⁻  SO₄²⁻  SO₄²⁻
STRUCTURAL CONTROLS

Whitehill Formation

Major Folds

Doornfontein

Klipplaat

Mount Stewart

2 km

2 km
STRUCTURAL CONTROLS

Whitehill Formation

Doornfontein

Klipplaat

Major Folds

Minor Folds

Synclinal Folds

Major Folds

Minor Folds

Mount Stewart

56°

52°
CARBONATE CONCRETIONS

Sub-vertical strata

In situ Concretion

1 m

50 cm

50 cm
FURTHER STUDY

- Prove/Disprove relationship between small and large folds – Cape Fold Belt-related deformation OR more recent ‘swelling’ of Whitehill Formation shale
- Relate small-scale faulting to the larger folds
- Compare gypsum deposits – PPC Mine & SA Lime future mine
- Relate pyrite content to gypsum deposits – petrographic & core analysis
- Consider concretions and relationship to gypsum AND shale gas