
LIST OF FIGURES

- Figure 1:** Location and regional geological setting of the Zeekoebaart and Nauga East high-grade iron ore deposits in Griqualand West, Northern Cape Province (Pg. 3).
- Figure 2.1:** Geological map of the Transvaal Supergroup in Griqualand West, showing the localities of the two iron ore deposits investigated during this study (Pg. 5).
- Figure 2.2:** Stratigraphic cross-section of the Transvaal Supergroup, from Prieska to Thabazimbi (modified after Beukes, 1983) (Pg. 6).
- Figure 2.3:** Stratigraphy of the Transvaal Supergroup in Griqualand West with radiometric ages indicated (modified after Dorland, 1999) (Pg. 7).
- Figure 2.4:** South-North cross section illustrating stratigraphic relationships and palaeodepositional environments of the Asbestos Hills Subgroup in Griqualand West (modified after Beukes, 1978) (Pg. 11).
- Figure 3.1.A:** The regional geology of the Zeekoebaart high-grade iron ore deposit in the Boegoeberg Dam area (modified from Dorland and Beukes, 2001) (Pg. 17).
- Figure 3.1.B:** Cross-sections through the Boegoeberg Dam area (after Dorland and Beukes, 2001) (Pg. 18).
- Figure 3.2:** The stratigraphic position of the Zeekoebaart high-grade iron ore deposit (Pg. 20).
- Figure 3.3:** Hand specimen photographs of important lithologies at the Zeekoebaart high-grade iron ore deposit (Pg. 23).
- Figure 3.4:** Photomicrographs illustrating typical petrographic characteristics of hematitized iron formation of the Zeekoebaart deposit (Pg. 26).
- Figure 3.5:** Photomicrographs illustrating petrographic characteristics of hematitized iron formation samples from Zeekoebaart (Pg. 27).
- Figure 3.6:** Photomicrographs illustrating petrographic characteristics of laminated hematite ore from the Zeekoebaart deposit (Pg. 30).
- Figure 3.7:** Photomicrographs illustrating petrographic features of massive hematite ore from the Zeekoebaart deposit (Pg. 31).
- Figure 3.8:** Mineral paragenesis chart for the hematitized iron formation and hematite iron ore types from the Zeekoebaart deposit, as determined from this study (Pg. 33).
- Figure 3.9:** Flow chart illustrating the formation of hematitized iron formation and high-grade hematite ore types at the Zeekoebaart deposit (Pg. 34).
- Figure 4.1:** Interpreted modified aerial photograph of the geology surrounding the Nauga East deposit (Pg. 36).
- Figure 4.2:** Detailed surface map of the Nauga East high-grade iron ore deposit (Pg. 37).
- Figure 4.3:** Drill hole intersections through the northern outcrop area of the Nauga East deposit (Pg. 39).

- Figure 4.4:** Photographs of the carbonatite and syenite samples at Nauga East (Pg. 42).
- Figure 4.5:** Photomicrographs illustrating the petrographic characteristics of the syenite-carbonatite intrusion at Nauga East (Pg. 44).
- Figure 4.6:** Scanning Electron Microscope (SEM) images of the lithologies of the syenite-carbonatite intrusion (Pg. 45).
- Figure 4.7:** Photographs of hematitized BIF and different iron ore types at Nauga East (Pg. 47).
- Figure 4.8:** Photomicrographs illustrating the petrography of the hematitized iron formation from Nauga East (Pg. 50).
- Figure 4.9:** Scanning electron microscope microphotographs of hard hematite ore from the Nauga East deposit (Pg. 53).
- Figure 4.10:** Photomicrographs illustrating the petrographic characteristics of hard hematite ore from the Nauga East deposit (Pg. 54).
- Figure 4.11:** Photomicrographs illustrating the characteristics of the specular hematite ore from the Nauga East deposit (Pg. 56).
- Figure 4.12:** Photomicrographs illustrating the petrography of the botryoidal hematite from the Nauga East deposit (Pg. 58).
- Figure 4.13:** Mineral diagenesis chart for the hematitized iron formation and ore formation at the Nauga East deposit, as described in this study (Pg. 60).
- Figure 4.14:** Flow chart illustrating the formation of the hematitized iron formation and the high-grade hematite ore types at Nauga East (Pg. 61).
- Figure 5.1:** Spider-grams and REE geochemistry for the hematitized iron formation from Zeekoebaart (Pg. 68).
- Figure 5.2:** Geochemistry of laminated and massive hematite ores from Zeekoebaart (Pg. 74).
- Figure 5.3:** Geochemistry for hematitized iron formation samples from the Nauga East deposit (Pg. 81).
- Figure 5.4:** Major element geochemistry of different ore types from the Nauga East deposit (Pg. 85).
- Figure 5.5:** Distribution of selected trace elements of hard, specular and botryoidal hematite ores from Nauga East and the *Kuruman Iron Formation* (Horstmann and Hälbich, 1995) (Pg. 88).
- Figure 5.6:** PAAS-normalized REE distribution for texturally different hematite ore types from the Nauga East deposit (Pg. 91).
- Figure 5.7:** Geochemistry of the carbonatite and pseudo-carbonatite from the Nauga East deposit, using discrimination plots after Woolley and Kempe (1989) (Pg. 94).
- Figure 5.8:** Geochemistry of the syenite and carbonatite suite of rocks from Nauga East (Pg. 97).
- Figure 5.9:** $\delta^{18}\text{O}$ vs. $\delta^{13}\text{C}$ of the Fe-Dolomite groups (Pg. 100).
- Figure 5.10:** Major element geochemistry of high-grade iron ore deposits (Pg. 101).

Figure 6.1: The classification of major types of high-grade hematite iron ore deposits (modified after Beukes *et al.*, 2002) (Pg. 106).

