

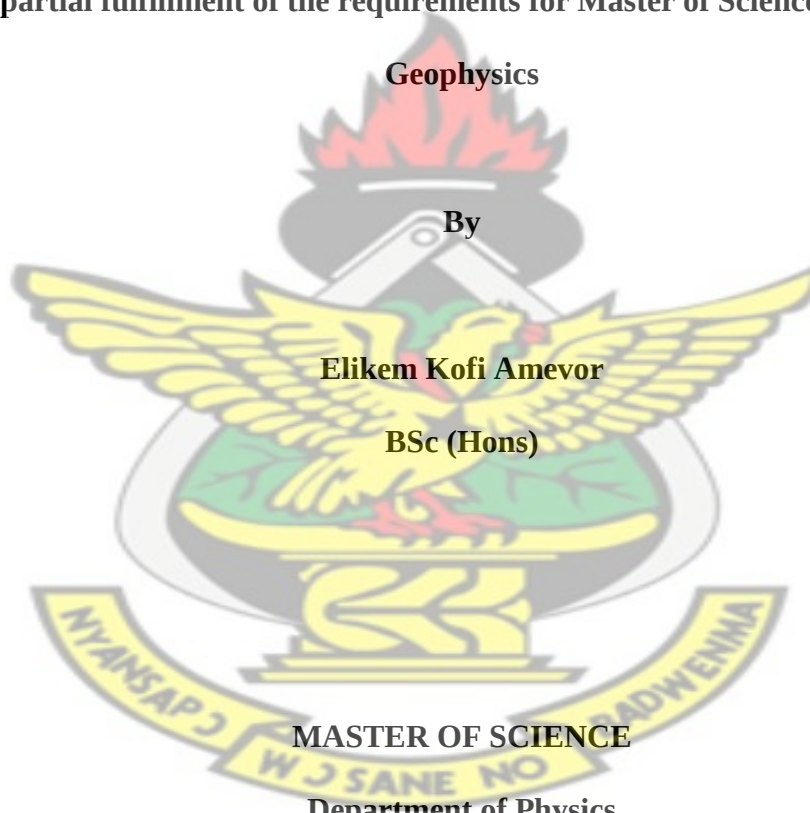
**MAGNETIC SUSCEPTIBILITY AND DENSITY CHARACTERIZATION OF
MINERALIZED AND NON MINERALIZED ROCKS IN THE CHIRANO
GOLD CAMP, GHANA**

**A Thesis submitted to the School of Graduate Studies,
Kwame Nkrumah University of Science and Technology, Kumasi, Ghana,
in partial fulfillment of the requirements for Master of Science Degree in
Geophysics**

By

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MASTER OF SCIENCE

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November 2013

DECLARATION

I hereby declare that this thesis is the result of my own original research work undertaken under the supervision of the undersigned, that all works consulted have been referenced and that to the best of my knowledge no part of this material has been presented for another degree in this University or elsewhere.

KNUST

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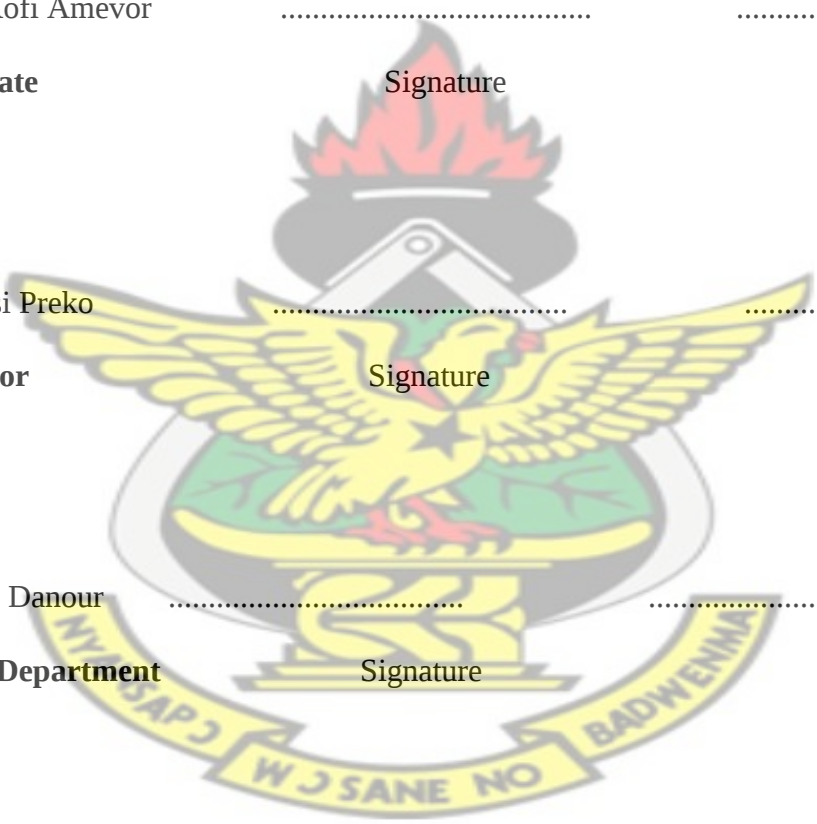
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Head of Department

Signature

Date



DEDICATION

To my family and friends

KNUST



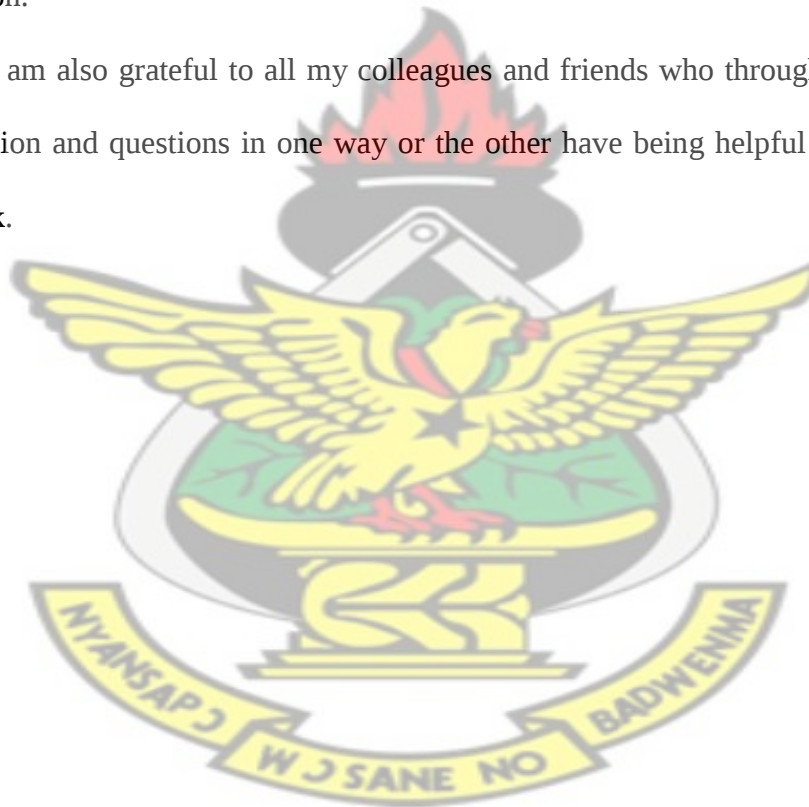
ACKNOWLEDGEMENTS

My profound gratitude goes to the almighty God for providing me with the strength and wisdom to go through this work.

I am also immensely grateful to my supervisors Dr. Kwesi Preko and Mr. David Dotse Wemegah, both lecturers of the Physics Department, KNUST.

My next appreciation goes to Dr. S.K.Y. Gawu of the Geological Engineering Department for being benevolent in being the lead in acquiring the diamond drilled cores that I worked on.

Finally I am also grateful to all my colleagues and friends who through their criticisms, contribution and questions in one way or the other have being helpful to the success of this work.



ABSTRACT

Magnetic susceptibility measurements taken on drilled cores from two holes indicate that the core from Paboase deposit had a magnetic susceptibility value within the range of $(3.96 - 7.49) \times 10^{-6}$ SI and a mean of 5.90×10^{-6} SI for the non mineralized rocks and magnetic susceptibility within the range $(2.29 - 4.58) \times 10^{-6}$ SI for the mineralized rocks with a mean value of $3.51.90 \times 10^{-6}$ SI. The drilled core from the Akwaaba deposit had a magnetic susceptibility in the range of $(5.02 - 12.36) \times 10^{-6}$ SI with a mean of 7.37×10^{-6} SI for the non mineralized rocks and $(1.0 - 7.0) \times 10^{-6}$ SI with a mean of 4.99×10^{-6} SI for mineralized rocks. Comparatively, the magnetic susceptibility of the non mineralized rocks from the Paboase concession are high with low assay values within the range of $(0.01 - 0.17)$ ppm while the mineralized rocks have low magnetic susceptibility with high assay values within the range of $(1.25 - 17.4)$ ppm. The assay result for the Akwaaba deposit follows the same trend as that of Paboase deposit, low from $(0.00 - 0.04)$ ppm within the non mineralized rocks but high assay values of $(0.41 - 10.13)$ ppm within the mineralized rocks.

There was a general negative correlation between the assay values and the magnetic susceptibility values. The magnetic susceptibility values decrease drastically for rocks with high gold assay values while those with very low gold assay values generally have high magnetic susceptibility values.

Selected rocks from the two holes on which density measurements were carried also produced densities around the means of 2698.56 kg/m^3 for basalt and 2704.11 kg/m^3 for tonalite from Paboase deposit, 2959.57 kg/m^3 for basalt from Akwaaba deposit

These correlations are strong signals that can be used to delineate mineralized zones in the area with a prove backed by the use of other geophysical method.

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LIST OF ABBREVIATIONS AND ACRONYMS

Au	Gold
CGS	Centimetre-gram-second
KNUST	Kwame Nkrumah University of Science and Technology
NW	North west
MS	Magnetic susceptibility
Ppm	Parts per million
SW	South west
X_v	volume magnetic susceptibility
X_{mol}	Molar magnetic susceptibility
K	Magnetic susceptibility

