



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF MINING AND WATER RESOURCES

FINAL YEAR PROJECT

**ASSESSING THE DRILLING AND BLASTING PARAMETERS TO
MINIMIZE THE IMPACT OF GROUND VIBRATIONS TO THE
SURROUNDING ENVIRONMENT.**

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**Report submitted in partial fulfillment of the requirements for the award of a Bachelor of
Science in Mining Engineering Busitema University**



ABSTRACT

This report entails assessing the drilling and blasting parameters to minimize the impact of ground vibrations to the surrounding environment at Seyani International Company Quarry in Buntaba village, Kyampisi sub – county, Mukono District. Blasting is an economical process for detaching rocks from their parent rock. Ground vibrations is the negative energy as a result of blasting and these affect the infrastructure in the nearby community thus cracking their residential houses and affecting their poultry. This project optimizes the parameters to minimize the effects of blasting through the ground vibrations monitoring program which was designed to ease the blasting job by optimizing the drilling and blasting parameters. The parameters were analyzed and five parameters contributed to the vibrations which include; burden, spacing, stemming, hole diameter and charge amount. Ground vibrations were found out to be in the range of 7 – 10mm/s which is above the USBM standard. A ground vibrations monitoring program was developed with the aid of visual basic programming language linked to excel for a blast management information system. The program can be adopted in the mining industry especially for companies that carry out blasting and ensures that productivity is at its most.

DECLARATION

I **KATAZA PETER**, a student pursuing a Bachelor's of Science in Mining Engineering at BUSITEMA UNIVERSITY declare that this final year project report I have presented is my very own report.

This report has never been published by any other student/individual in any institution either in full or part.

SIGNATURE: 

DATE: 26/05/2017



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First of all, I thank the Almighty God for his protection, blessings, grace and mercy throughout my research project.

With great honor thank my loving parents for the support especially financially that aided in the accomplishment of my project.

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I also extent my gratitude to my fellow colleagues for the help when in need of advice thanks so much the class of 11.

DEDICATION

I dedicate this report to my parents Mr. Mukasa Kataza John and Antonina Mbejjo for the financial support they gave me am truly grateful, my siblings, my supervisors and management of Seyani International Company Limited for the knowledge they provided tirelessly.

I also dedicate this report to the class of 11 and all my colleagues.

APPROVAL

This final year project proposal has been submitted for examination with the approval of my supervisors.

1. Main supervisor

Name Mr. Tugume Wycliffe

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2. Co – Supervisor

Name: Mr. Wangi Mario

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LIST OF ACRONYMS

PPV Peak Particle Velocity

BMIS Blast Management Information System

NEMA National Environmental Management Authority

ANFO Ammonium Nitrate Fuel Oil

RDM Relative Diagram Method

1.0 CHAPTER ONE

1.1 BACK GROUND

If it can't be grown, then it has to be mined and thus if the ground is too hard then blasting is a necessity. Due to increased development within countries in terms of infrastructure, there is a high demand for the production of material for the infrastructure construction. Blasting is therefore an economical and viable method for rock excavation but it has negative effects such as ground vibrations, air blasts and flying rocks thus endangering the surrounding environment. Blasting operations, carried out in mining, have an impact on many different objects such as underground, fauna and flora which have to be thoroughly protected in order not to cause more damage but benefit by utilizing the blasting energy.

(According to Kondela and Pandula, 2010)

Vibration, or seismic energy, is an undesirable side-effect of blasting and it is the shaking of the ground, by elastic waves emanating from a blast. It is usually described as the displacement, acceleration or velocity of a particular point (or particle) in the ground. Peak particle velocity (PPV) has been universally accepted as the best description of vibration.

(According to the Caltrans blasting manual, 2013)

Ground vibrations is one of the most troublesome issue facing mining due to blasting. It affects our structures causing damages such as cosmetic, minor and major damages. These damages are also as a result of a structure experiencing repeated vibration events.

(According to Dr. Mostafa Tantawy Mohamed from Assiut University Egypt, 2010)

In Uganda, difficulties arise when certified blasters are required to submit site-specific blast plans to regulatory agencies. These agencies have minimal knowledge of the relationship between surface blast designs and ground vibration impacts on the surrounding environment. No damage should occur at a low-rise residential structure due to surface mine blasting vibration. If the vibrations are large enough, then the ambient objects could be damaged or destroyed

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