



**BUSITEMA
UNIVERSITY**
Pursuing excellence

FACULTY OF ENGINEERING

DEPARTMENT OF MINING ENGINEERING

**PHYTOREMEDIATION USING LIMA BEANS (PHASEOLUS LUNATUS) TO
REMOVE CYANIDE CONTENT IN MINE TAILINGS**

CASE STUDY: GREENSTONE MINING COMPANY

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ABSTRACT

Mining industries face a challenge of high levels of cyanide in mine tailings. Cyanide is a strong binder for complexating with virtually heavy metal. This complexation with heavy metal can inhibit all biochemical processes resulting in human organ failure and even death. Research has it that remediation has always been chemical methods for example addition of oxidants and complexing agents such as ferrous sulphate which in the long run cause secondary pollution.

Phytoremediation utilizes the equations of data analysis to measure the cyanide concentration in soil. It also uses the Friedman statistic to determine if there are statistically significant differences in cyanide concentrations across the stages of growth of the lima beans.

This project rendered significant advantages such as significant potential of lima bean in improving soil health, nitrogen-fixing capability, the enhancement of the biological, chemical, and physical properties of the soil, organic matter, and soil structure, and in reducing soil bulk density, increasing soil water holding capacity, and promoting soil microbial diversity and activity, leading to enhanced soil ecosystem stability, thus enhancing soil quality. By demonstrating the feasibility and effectiveness of this method, the project aims to contribute a safer, more sustainable mining environment.

DECLARATION

LACHOM SHEILA FORTUNATE, hereby declare that this report was written by me and is a true picture of what transpired during the proposal development time. I affirm that the research conducted for this report was carried out diligently, employing reliable sources and appropriate methodologies. The external sources used have been appropriately cited, referenced, and credited

This report has not been utilized in the acquisition of an academic award by any individual or any learning institution

Date 15/05/2025

Signature KE

APPROVAL

I ACHOM SHEILA FORTUNATE, submits this report of my final year project to the faculty of engineering in the department of mining engineering for examination with approval of my supervisors.

MR. KWIKIRIZA MATHIAS

Signature.....

Date:.....14th/05/2025.....

Mr. TIGALANA DAN

Signature.....

Date.....15/05/2025.....

DEDICATION

I would like to dedicate this report to my family members, friends, and relatives.

ACKNOWLEDGEMENT

I take this opportunity to thank the almighty **GOD** for granting me life, good health, and the ability to research and gather information that is integrated in this report.

I am deeply indebted to my dear supervisors: **MR KWIKIRIZA MATHIAS AND MR. DAN TIGALANA** for the time, support, guidance, knowledge, and advice provided to me during the preparation of this research proposal. May the almighty reward you abundantly.

Table of contents

ABSTRACT.....	i
DECLARATION	Error! Bookmark not defined.
APPROVAL	Error! Bookmark not defined.
DEDICATION.....	iv
ACKNOWLEDGEMENT	v
1.0 CHAPTER ONE	1
1.1 Background	1
1.2 PROBLEM STATEMENT	2
1.3 OBJECTIVES OF THE STUDY	3
1.31 Main objective.....	3
1.32 SPECIFIC OBJECTIVES.....	3
1.4 JUSTIFICATION OF THE STUDY	3
1.5 SCOPE OF STUDY	3
1.51 Conceptual scope.....	3
1.52 Geographical scope	4
2.0 CHAPTER TWO LITERATURE REVIEW	4

2.1 Introduction	4
2.2 Principles and mechanisms of phytoremediation of cyanide	5
2.21 Phytoextraction	6
2.22 Phytostabilisation.....	6
2.23 Phytovolatilization	7
2.24 Rhizofiltration.....	7
2.3 Plant strategies for growing in contaminated soils.....	7
2.4 Factors influencing phytoremediation	8
2.5 Legumes (lima beans) as phytoremediators	9
2.6 Mechanism of the legume-rhizobium interaction.....	11
3.0 CHAPTER THREE: METHODOLOGY	11
3.1 Materials and equipment	11
3.11 Determination of initial cyanide concentration in Mine Tailings	12
3.12 Determination of reduction efficiency of cyanide at different growth stages.....	12
3.13 Developing a model that forecasts time required for complete cyanide removal	13
4.0 CHAPTER FOUR.....	13
4.1Results and discussions	13
4.11 Determination of the initial concentration of cyanide in tailings.	13

4.12 Determination of reduction efficiency of cyanide at different growth stages	14
4.13 Developing a model that forecasts time required for complete cyanide removal	17
5.0 CHAPTER FIVE CONCLUSIONS AND RECOMMENDATIONS	20
5.1 Conclusions	20
5.2 Recommendations	20
5.3 Challenges	20
APPENDICES	22
MANUSCRIPT	23
REFERENCES	27

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