ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT

FOR

PROPOSED PLASTIC RECYCLING AND MANUFACTURE OF PLASTIC BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, BORE HOLE, WATER STORAGE DAM, STAFF HOUSES AND FENCING) IN KAJIADO COUNTY PLOT NO KJD/KAPUTEI NORTH/33878

Construction site Co-ordinates Latitude -1.753159 and Longitude 36.924228

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OCTOBER 2023

ESIA AUTHENTICATION

PROJECT CONSULTANT
Certification by the EIA/EA Expert

I hereby certify that this ESIA Study report for the proposed Plastic recycling of and manufacture of Plastic Battery Casing and establishment of associated structures (administration block, water storage dam, bore hole staff residential houses) within a block of land reference numbers **KJD/Kaputei North/33878** in Enkirgirri Village, Olmerrui Sub-Location, Isinya Location, Kajiado County has been done by me as a Lead licensed expert and other relevant experts and that the study criteria, methodology and content reporting conforms to the requirements of the amended Environmental Management and Coordination Act 2015, section 147 with regard to full study reports

Signature: _____ **Date: 9th November 2023**

EIA/EA Expert: Michael Ngugi

NEMA Reg. No. Lead Expert 7268

Certification by Proponent

I hereby confirm that the contents of this ESIA study report are true and shall guide the implementation of the proposed mitigation measures and also wish to undertake to implement further instructions from NEMA in relation to these study findings as well as feedback from onsite inspections.

Signature: _____ **Date: 9th November 2023**

Managing Director

ACKNOWLEDGEMENTS

The preparation of this ESIA study report was made possible by a collaborative effort involving the proponent, consultants, neighbors and project stakeholders. We thank the proponent, Associated Battery Manufactures (East Africa) Limited (ABM), for providing the requisite logistical, financial, human resources and documentation on the proposed project.

We acknowledge the contribution from the Mzee wa Nyumba Kumi, Mr Amos Kinyoie, Ward Administrator, Mr. Emmanuel Kitoipei, the office of the Chief – Enkirgirri location, Mr. Geoffrey Nairi, during the community and stakeholder consultative meetings.

We are indebted to the community members and stakeholders for accepting to participate in the consultative meetings and providing their views, comments and concerns in respect to the proposed project.

Sampling and analysis of environmental media which included air quality and noise levels were undertaken by Airsense Environmental Lab Ltd. The consultants are grateful for their invaluable input in the preparation of the ESIA study report.

The staff of Mishan Ecosafety Agency Limited assisted the lead consultants in data collection and analysis, preparation of the draft and final reports.

EXECUTIVE SUMMARY

Associated Battery Manufacture (ABM) Limited is a registered company in Kenya and would wish to establish a Plastic Recycling factory and manufacture plastic casing for batteries manufacture in Kajiado County, Enkirgirri Village, Olmerrui Sub-Location, Isinya Location. The proposed project will be supported with other auxiliary developmental projects i.e., construction of an administration block, water storage dam, bore hole, construction of staff houses for accommodation and fencing of the facilities for security purposes. In compliance with the provisions of the environmental management and coordination act 2015, the proponent hereby submits these ESIA study report to the National Environment Management Authority (NEMA) for review, consideration and approval to pave way for construction and operational of the proposed project.

These ESIA study report have been prepared in accordance with the legal requirements of the Environmental Management and Coordination Act, EMCA 2015 amendment and Environmental (Impact Assessment and Audit) 2006 and Amendment Regulations of 2019 requiring projects listed in schedule II to undergoes environmental impact assessment prior to implementation, we have identifies that the project in question is of high risk (based on the project magnitude) and require cautious approach for environmental, social and economic sustainability. The proposed project will be implemented on a block of land currently measuring 58 acres.

Based on the consultants site visit, interview with the project proponent, public participation with immediate project affected persons, local and county administration and analyses, it was established that the proposed project is of high risk and require vital mitigation measures to be put in place and the proponent has to constantly put in place and implement mitigation measure that will be proposed in the environmental and social management plan that will be developed for continuous improvement and sustainability. From the findings, immediate positive impacts which will be realized with the implementation of the proposed project include.

I. Contribution towards industrial development coherent with Kenya's Vision 2030 – Economic and Macro Pillar, mitigating the national and regional demand for batteries.

II. Improving livelihood and increasing income from employment opportunities – the proposed project will provide employment for the locals who will be responsible the plastic recycling.

III. Plastic recycling and manufacture of Battery casing, process, loading, transportation. and final transportation of the casing for battery manufacture will generate income for the proponent and the country at large.

IV. Enhanced economic growth – the proposed facility will enhance the economic growth of Kajiado County through revenue generation through various applicable forms of county taxation.

V. Contribution to the development of the local infrastructure through, increased, roads, power connectivity and enhanced water supply.

VI. Increased land and resource value addition through plastic recycling in the region

VII. The project will contribute to creating a globally competitive and prosperous Kenya with high quality of life that aims to transform Kenya into a newly industrializing middle-income country contributing to the national and regional Battery trade.

Negative impacts on the environment will occur throughout the project cycle and these are;

I. Plastic recycling causes will cause the following impacts to the environment,
   a) Land-use pattern with loss of habitat,
   b) Dust generation during construction,
   c) High levels of noise excessive vibrations (during construction),
   d) Groundwater flow,
   e) Air emission,
   f) Groundwater quality and overall water quality.

II. The construction activities for the Plastic recycling plant and other projects auxiliary amenities will require raw materials such as sand and cement, ballast, steel bars / rods and the plant equipment among others which will be sourced from the environment. These materials will have negative environmental impacts at their points of origin.

III. A large section of the proposed project site will be cleared of vegetation to pave way for excavation activities which will disrupt the macro habitat and the species they support. There are species that are resistant to such disturbances while others are adversely affected to the extent of completely disappearing from the excavation zone for plant foundation.

IV. The workforce to the proposed project site will be exposed to potential safety and health risks during the construction phase. The potential safety risks will be from the use of

machinery, risks from moving machinery, falling objects or even falls, dust and noise pollution among others.

V. The construction works, delivery of construction materials by heavy trucks and the use of machinery will lead to high levels of noise and vibration within the construction site and the surrounding area. Additionally, air pollution will be as a result of dust generated during excavation, concrete mixing activities and exhaust fumes from heavy commercial vehicles accessing the project site.

VI. Construction activities will utilize substantial quantities of water for mixing and casting concrete, drinking and sanitation purposes which will lead to an increased demand for water.

VII. Site preparation, construction and recycling activities are expected to generate significant quantities of solid waste such as cuttings and rejected materials among others. Poor disposal of solid waste is an eyesore, can harbor pests and pathogens as well as pollute soil and groundwater.

VIII. Machinery used for construction, recycling activities and vehicles delivering materials to the site will need petroleum products such as fuel, oils, lubricants etc. There is potential for leakage and spillage during fueling, servicing and maintenance of machinery and vehicles. A release of petroleum products to the environment threatens ground and surface waters thereby endangering drinking water supplies.

IX. Stockpiles of plastic waste material have a negative effect on the landscape by causing visual intrusion.

X. Recycling activities pose potential threats to the health and safety of workers on site. This may be in the form of air and noise pollution, fumes from machinery and vehicles accessing the site, accidents from machinery and equipment, injuries that may result from accidents among others.

XI. Emissions from vehicle movement will potentially present respiratory hazard, cause eye irritation and visual intrusion to the workers, visitors to the site.

XII. Fire risks and emergencies at the proposed facility can occur due to operational negligence, electrical faults and spillage of flammable materials. This can result to injuries, loss of lives and property.

XIII. The exposures to heat in a plastic recycling plant occurs during the operation and other hot equipment and exothermic reaction. This will expose the workforce to lots of heat leading to heat exhaustion and stroke among other heat related illness.

XIV. Water use at the facility will be mainly for dust suppression, cooling machines and general housekeeping. Water used for dust suppression and general housekeeping will seep into the ground thus the effluent generated will be domestic in nature.

XV. Solid waste during operations will consist of packaging materials, and grease containers, and office waste among others. These have a potential of pollution if not disposed of appropriately.

XVI. During operations, waste oil at the facility will be generated from servicing and maintenance of vehicles and machinery. Oil spillages can cause potential contamination of the environment and potentially ground water pollution and runoff contamination during rainy seasons.

XVII. A decommissioning phase is possible in the event of closure by government agencies due to noncompliance with environmental and health regulations, end of project life, an order by a court of law due to non-compliance with existing regulation. Key environmental and social concerns at this phase will be on an economic decline, safety and health risks, waste generation and insecurity.

Despite having these negative impacts, the proposed project is considered important and beneficial to the economy as it will contribute towards industrial development coherent with Kenya's Vision 2030, socio-economic growth of the area through employment creation, increased revenues and utilization of local resources. These negative impacts will be mitigated in the environmental and social management plan during the full study process. Therefore, it is our recommendation that these proposed project ESIA study report should be approved and the subsequent processes be allowed to takeoff for effective project implementation.

TABLE OF CONTENTS

ESIA AUTHENTICATION 2
PROJECT CONSULTANT 2
ACKNOWLEDGEMENTS 3
EXECUTIVE SUMMARY 4
LIST OF ACRONYMNS 12
CHAPTER ONE 14
1.0 INTRODUCTION 14
1.1 The Plastic sector in Kenya 14
1.2 Plastic Battery Casing in Kenya 14
1.2 Principal of Environmental and Social Impact Assessment (ESIA) full study consideration. 14
1.3 Proposed project objectives. 15
1.4 Objective of the ESIA 15
1.5 Proposed Project Scope 16
1.6 Project Terms of Reference 16
CHAPTER TWO 19
2.0 PROJECT DESCRIPTION AND PHYSICAL ENVIRONMENT 19
2.1 Proposed Site Location 19
2.2 Plastic in Kenya 19
2.2.1 Plastic Recycling and Battery Casing Manufacture 20
2.2.2 Agriculture 21
2.2.3 Creation of employment (Recycling and Battery Manufacture) 22
2.2.4 Uses of Plastic Casing 22
2.3 processing 22
2.3.1 Impacts on Land and Soil 22
2.3.2 Impacts Due to Construction 22
2.3.3 Impacts on Air Quality 23
2.3.4 Impacts on Water Resources 23
2.5 Sustainable Recycling for Environmental Hazard Management 23
2.5.1 Environment Management Plan 23
2.5.2 Mitigation Measures for Land and Soil Environment 24
2.5.3 Mitigation Measures for Noise Environment 24
2.5.4 Mitigation measures for Air Pollution 25
2.6 Project Budget 25
2.7 NEMA Statutory fee 25
CHAPTER THREE 27

3.0 PROPOSED PROJECT SITE LOCATION BASELINE CONDITIONS 27
3.1 Baseline Information of Kajiado County 27
3.2 Demographic Feature 27
3.3 Climate and vegetation cover 27
3.4 Topography 28
3.5 Land use patterns and socio-economic activities 29
3.6 Infrastructure 29
3.6.1 Water resources 29
3.6.2 Transport 29
3.6.2 Power 29
3.6.3 Baseline environmental data 30
CHAPTER FOUR 32
4,0 POLICY, LEGAL AND ADMINISTARTIVE FRAMEWORK 32
4.1 General Overview 32
4.2 Policies 32
4.2.1 The Constitution of Kenya, 2010 32
4.2.2 Vision 2030 33
4.2.3 National Environmental Action Plan (NEAP) 48 34
4.2.4 National Policy on Water Resources Management and Development 34
4.2.5 Sessional Paper on Environment and Development (No. 6 of 1999) 34
4.2.6 International Obligations- Multilateral Environmental Agreements 35
4.3 Legal Aspects 35
4.3.1 The Environment Management and Coordination Act, 2015 amendment 35
4.3.2 Environmental Management and Co-ordination (Water Quality) Regulations, 2006 - Legal Notice No. 120 36
4.3.3 The Environmental (Impact Assessment and Audit) Regulations, 2019 36
4.3.4 The Water Act, 2002 38
4.3.5 The Water Resources Management Rules, 2007- Legal Notice No. 171 38
4.3.6 The Public Health Act (Cap. 242) 39
4.3.7 The Penal Code, Cap 63 39
4.3.8 Legal Notice 40 (Building, Operation & Work of Engineering) Rules 1984 39
4.3.9 Penal Code Act (Cap.63) 39
4.3.10 Sustainable Waste Management Act 2022 39
CHAPTER FIVE 41
5.0 ENVIRONMENTAL ISSUES 41
5.1 Identification Analysis and Appraisal of Impacts 41

5.2 Physical Environment (Biophysical Impacts) 41
5.2.1 Natural Environment 41
5.2.2 Social welfare, Economic and Cultural Environment 41
5.3 Environmental and Social Impacts identification and appraisal 42
5.3.1 Positive impacts of the proposed project 42
5.3.2 Anticipated negative environmental and social impacts 43
5.3.3 Negative impacts at the operational phase of the proposed project 48
5.3.4 Negative impacts at possible decommissioning phase of the proposed project 55
5.4 Impact analysis 57
CHAPTER SIX 60
6.0 PUBLIC CONSULTATION AND TARTICIPATION 60
6.1 Legal basis 60
6.2 Data Collection Methods 60
6.2.1 Dimensions of views and opinions required 60
6.2.2 Target participants 61
6.2.3 The CPP methods and supportive tools 62
6.2.4 Views collection, analysis and use 63
6.2.5 Collection of the stakeholder views 63
6.2.6 Community and stakeholder consultative meetings 65
6.2.7 Grievances Redress Mechanism 68
6.2.8 Grievances Redress Mechanism Tool 69
CHAPTER SEVEN 70
7.0 MONITORING PLAN AND ALTERNATIVES TO DEVELOPMENT 70
7.1 Monitoring plan 70
7.1.1 Training Programmes 70
7.1.2 Emergency preparedness 70
7.1.3 Air and water quality 70
7.2 Project Alternative for Development 70
7.2.1 The 'No Project' alternative 71
7.2.2 The "proposed Project" alternative 71
7.2.3 Alternative project site 72
7.2.4 Alternative project 72
CHAPTER EIGHT 73
8.0 SUMMARY OF ANTICIPATED IMPACTS AND THEIR MITIGATION MEASURES 73
Table 8.1: Environmental and Social Management Plan for the site preparation, and construction phase of the proposed project auxiliary amenities 73

Table 8.2: Environmental and Social Management Plan for the operational phase of the proposed project. 77
Table 8.3: Environmental and Social Management Plan for the decommissioning phase of the proposed project 82
CHAPTER NINE 84
9.0 CONCLUSIONS AND RECOMMENDATIONS 84
9.1 Conclusions 84
9.2 Recommendations 84
10.0 REFERENCES 86
11.0 LIST OF ANNEXTURES 87

LIST OF ACRONYMNS

ASAL	Arid and Semi-Arid Land
CIDP	County Integrated Development plan
CSR	Corporate Social Responsibility
DOSHS	Directorate of occupational safety and health
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Authority
ESMP	Environmental and Social Management Plans
ETP	Effluent Treatment Plant
HCVs	Heavy Commercial Vehicles
KNBS	Kenya National Bureau of Statistics
MT	Metric Tonnes
NCA	National Construction Authority
NEMA	National Environment Management Authority
OSHA	Occupational Safety and Health Act
PPE	Personal Protective Equipment
SDGs	Sustainable Development Goals
TORs	Terms of Reference
WRA	Water Resources Authority

WRB	Water Service Regulatory Board
WRUAs	Water Resources Users Associations
WSBs	Water Service Boards
WSPs	Water Service Providers

CHAPTER ONE

1.0 INTRODUCTION

ABM Limited would wish to establish a plastic recycling and battery casing manufacture and establishment of associated auxiliary structures (administration block, staff residential houses, drilling of borehole, water storage dam and fencing within a block of land reference numbers KJD/KAPUTIEI NORTH/33878 in Enkirgirri Village, Olmerrui Sub-Location, Isinya Location, Kajiado County. The project proposed location is on 58 acres piece of land whose change of user was approved from agricultural to Industrial by Kajiado County Government.

1.1 The Plastic sector in Kenya

The 2023 Economic Survey report shows that plastic production in the country increased by 1.4 percent in 2022 compared to 3.6percent in 2021. This is due to the decline in the production of sacks and bags of plastics which contacted by 7.8 percent. This was due to the government ban of carrier bags which are difficulty to manage and cause pollution to the Environment and the entire ecosystem. Kenya's daily plastic consumption through items such as single use straws, plastic bottles and containers is averaged at a high of 0.03kg per person. Estimate shows the amount of plastic that becomes waste across the country is 0.5 to 1.3 million tonnes per year, of which only 8 percent is recycled.

1.2 Plastic Battery Casing in Kenya

ABM Limited has been doing this but in small scale at their branch in Athi River the type of plastics that the company recycle (Poly propylene) is a by-product of used batteries. Under the following process.

1. PP generated from the battery crusher.
2. Cleaned off lead and dried.
3. Milled to make plastic regrind.
4. Fed in an extruder machine, melted and granulated/pelletized.
5. Fed into molders to make battery plastics components (lids and containers).
6. Shipped to assembly plant for battery manufacturing.

1.2 Principal of Environmental and Social Impact Assessment (ESIA) full study consideration.

The core principle of the ESIA is that every person has the right to a clean and safe environment and has a duty to improve and protect the environment. With this obvious logic and specific reasons, this proposed project ESIA study report is compiled after the term of reference was

approved by NEMA on the 29th September 2023. In addition to the above-mentioned main concept, other ESIA principles considered in the creation of the approved Terms of References (ToRs) report include:

I. Accounting for all environmental issues in the proposed project cycle activities proposed.
II. Performance evaluation of the proposed project activities and meeting or exceeding all relevant requirements and regulations.
III. Measuring and assessing environmental performance during the entire project cycle by performing daily internal audits.
IV. Conducting meaningful public engagement and participation to collect the necessary information on the proposed project activities from the interested and affected stakeholders.
V. Recognition of historically used social and cultural values in the management of the climate and natural resources.
VI. Emphasizing on Emergency preparedness and response planning and establishing a robust quantitative risk for the project Considerations.
VII. A precautionary principle which stipulates that action must be taken to avoid serious and irreversible damage.

1.3 Proposed project objectives.

The proponent aims to Recycle Plastic and Manufacture Battery casing for Battery manufacturing for use in automobile and storage of solar energy (Renewable energy) the county and the region at large.

. This project will ensure;

I. Boosting the local economy by offering job opportunities in the entire project cycle.
II. To make a more socio-economic use of the land as it is currently idle.
III. Enhance revenue collection hence contribution to that local and national government economic growth.
IV. Promote sustainable manufacturing in line with the national's Recycle, Reuse and Reduce policy of managing waste and use of natural materials.

1.4 Objective of the ESIA.

I. To comply with the legal requirements as outlined in section 58 of the EMCA 2015 and EIA/EA regulation of 1019.
II. Perform an environmental assessment of the project area with a view to avoiding environmental deterioration and ensuring the proper functioning of ecological systems.
III. Identify the major environmental impacts of the proposed project and analyzing them in line with available best alternatives.
IV. Formulation and implementation of the Environmental Protection and Monitoring Plan for the entire project life cycle.

1.5 Proposed Project Scope

For any new projects, initiatives or activities at their planning stages, the Environment Management and Coordination Act, 2015 mandates that an EISA be carried out to ensure that major environmental effects are considered during the project design eventual operation and decommissioning. The following scope has been considered and will guide the implementation of the proposed project.

I. Environmental screening in accordance with the proposed project.
II. Environmental scoping based on the site visits.
III. Identification of anticipated environmental impacts of the proposed project and scale of the impacts.
IV. Identification and analyses of alternative methods or technologies for implementation of the proposed project.
V. In-depth stakeholder consultation and public consultation for interested and affected parties.
VI. Examination of applicable international and national laws regulating patterns.
VII. Compensatory steps to take account of the big negative consequences if any.
VIII. Identification and discussion of the possible positive and negative effects on the physical, social, economic and cultural environments of the proposed project.
IX. Preparation of an Environmental and social Management Plan (ESMP) to direct the project's implementation.
X. Preparation of full study Environmental and Social Impacts Assessment report for the proposed project and submission to NEMA for decision making.

1.6 Project Terms of Reference

The terms of reference agreed between the experts and the project proponent(s) were as follows: -

I. To provide a description of the proposed project activities with a potential focus on potential adverse impacts in the proposed project design, operation and abandonment (decommissioning) phases caused by the inputs, waste generated and disposal and social economic aspects.

II. To establish the legal and regulatory aspects, administrative frame of reference, to identify governing standards, legislation and guidelines, and to determine permits and authorizations which will be required from different sectors agencies and institutions involved.

III. To describe the area of influence, and select methods of measuring the environmental aspects of concern including physical (water, air, soil and noise), biotic environment (vegetation, flora and fauna), chemical, socioeconomic (socio and economic structure, demographic, and socioeconomic background), cultural (aspects of cultural, archaeological, or anthropological interest) and landscape.

IV. To establish scales to be used for required maps and characteristics of baseline and other data required and the reliability or deficiency level stipulated for such data.

V. To establish the methods to be used in identifying and quantifying environmental impacts, methodologies for predicting those impacts and how those impacts will be described in terms of; character (negative or positive), condition (reversible or irreversible), period (short, medium, or long-term), scope (cumulative, synergistic, direct, indirect) and establishing what standards will be used for the ESIA.

VI. To establish at what stages of the project the mitigating, corrective and other measures will be used to eliminate, minimizing or mitigating adverse/significant impacts and how these measures will be selected.

VII. To define a schedule of activities, reaction with regard to risk prevention and accident control, objectives, specific tasks and budget through an Environmental and Social Management Plan (ESMP).

VIII. To provide a monitoring program of relevant environmental issues, specific variables to be included in the environmental follow-ups, detection limits and standards to be used and contents of the follow-up program.

IX. To establish the stakeholders to be involved in the community/public participation process, methods of reporting the project to the public, procedures to be used for

community participation and aspects to be considered in the community participation plan during the development and review of the study.

X. To establish the criteria to be used in defining the composition of the working team of experts and the special requirements and information needed to form the team and characterize the same respectively.

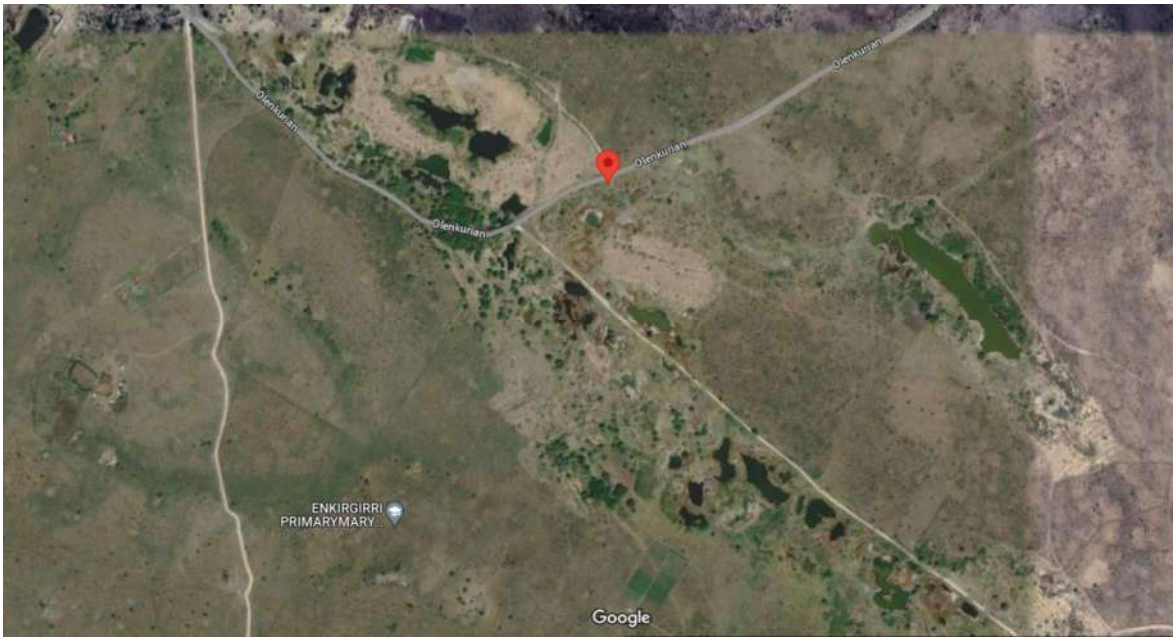
XI. To produce a systematic study report in accordance to the Environmental Impact Assessment and Audit Regulations of 2019.

CHAPTER TWO

2.0 PROJECT DESCRIPTION AND PHYSICAL ENVIRONMENT

2.1 Proposed Site Location

The proposed project lies on a block of land measuring 58 acre with title deeds of reference numbers LR KJD/KAPUTIEI NORTH/33878 in Enkirgirri Village, Olmerrui Sub-Location, Isinya Location, Kajiado County with the proposed construction site bounded by coordinates Latitude -1.753159, and Longitude 36.924228.



Source; Google Maps 7th September 2023

2.2 Plastic in Kenya

The 2023 Economic Survey report shows that plastic production in the country increased by 1.4 percent in 2022 compared to 3.6percent in 2021. This is due to the decline in the production of sacks and bags of plastics which contacted by 7.8 percent. This was due to the government ban of carrier bags which are difficulty to manage and cause pollution to the Environment and the entire ecosystem. Kenya's daily plastic consumption through items such as single use straws, plastic bottles and containers is averaged at a high of 0.03kg per person. Estimate shows the amount of plastic that becomes waste across the country is 0.5 to 1.3 million tonnes per year, of which only 8 percent is recycled.

2.2.1 Plastic Recycling and Battery Casing Manufacture

The process is as outlined below:

I. PP generated from the battery crusher.
II. Cleaned off lead and dried.
III. Milled to make plastic regrind.
IV. Fed in an extruder machine, melted and granulated/pelletized.
V. Fed into molders to make battery plastics components (lids and containers).
VI. Shipped to assembly plant for battery manufacturing.

Machinery to be installed for the above process are two types as shown below.

Offer No: RT20220826
To: Associated Battery Manufacturers {EA} LTD

Plastic Hard PP Plastic Washing Line

(Capacity:500kg/h)

Source; Purchase order to ABM Ltd

This Hard Plastic PE material recycling line is composed of crushing part, continuous washing parts and centrifuge & drying parts. It is specially design to deal with the materials like HDPE bottles, Hard PP, etc. The waste bottle will get fully cleaned and dry by our friction washing and squeezing dryer. You can send them to make granules in next step which is for making small pellets directly. This production line is with high

automatically operation and labor & energy savings quality. With advanced design concept and constantly advises from our regular customers, we can customize to meet all your specially demands.

Offer No: RM20230826
To: Associated Battery Manufacturers {EA} LTD

RHDJ150150 PP Rigid Plastic Flakes Double Stage Water Ring Pelletizing Line

（Capacity:500kg/h）

Source; Purchase order to ABM Ltd

Plastic Rigid Flakes Recycling and Pelletizing Line is mainly used in waste plastic granulation, and through the extruder, cutting, drying process, waste bottles into particles. This particle is widely used in the plastic industry, such as sheet material, plate, profile production.

2.2.2 Agriculture

Kenya is a largely agricultural economy. People rely on agriculture, not only as the main source of food production, but also as a major export income earner. This project will play a facilitative role to agriculture activities. Battery casing are used to manufacture batteries for automobile

and as storage for solar energy for powering homes while the automobile batteries are used for agricultural machinery and vehicles.

2.2.3 Creation of employment (Recycling and Battery Manufacture)

Recycling plastic and manufacture of battery casing provides employment for many people in Kenya, including engineers, machine operators, sales persons, accountants, environmentalists and drivers among others.

2.2.4 Uses of Plastic Casing

It is used to make battery plastics components (lids and containers) also it is shipped to assembly plant or battery manufacturing outside Kenya.

2.3 processing

2.3.1 Impacts on Land and Soil

Emissions to land may occur if contaminated materials are not properly handled and disposed. This may include acids from the batteries, contaminated electrolytes and lead. The facility will handle lead acid batteries thus need for proper handling and storage to reduce spillages and waste.

The proposed project site in Kajiado County, Enkirgirri Village is composed of rocks with a variety of tree and grass species that will be cleared to pave way for the proposed project

Photo; Some of the vegetation on the site currently.

2.3.2 Impacts Due to Construction

During construction phase, the potential negative impacts from this proposed project will be air pollution (land, air, and water), noise, loss of vegetation, insecurity, increased demand for water, traffic congestion, occupational hazards and fire risks. During operation, the impacts will be increased demand for water, increased traffic flow, effluent and more solid waste generation will be realized.

2.3.3 Impacts on Air Quality

Emission of Particulate Matter ($PM_)$ is associated with various construction activities like excavations, blasting of the rocky land, construction and ferrying in of construction materials. Dust emissions are of great concern related to air quality surrounding the construction site. Gaseous pollutants like sulphur dioxide (SO_2) and oxides of nitrogen (NO_x) are emitted from the Heavy Earth Moving Machineries (HEMM) like dumpers, excavators and transportation trucks.

The loss of a few shrub trees due to site clearance causes a loss of carbon dioxide uptake while heavy vehicles emit large quantities of carbon dioxide hence impacting on climate change.

2.3.4 Impacts on Water Resources

2.4.4.1 Impacts on surface water

The site will be engineered to prevent storm water from flowing through the project site. A small dam / a water pan will be constructed for storing storm water and roof catchment water for use during the recycling process.

2.4.4.2 Impacts on Groundwater

Plastic recycling is likely to result in relatively local impacts such as reduced water quality, rerouting of recharge water in aquifer, increased run-off and thereby leading to localized reduction in groundwater storage. Construction of a small dam/pan for water collection from the rain runoff and roof catchment will reduce the impact on ground water usage and its associated impacts due to over abstraction.

2.5 Sustainable Recycling for Environmental Hazard Management

2.5.1 Environment Management Plan

Environment Management Plan (EMP) is essential to be undertaken during operations and post-completion of the project. It is important to establish key environmental issues of concern

throughout the project circle and come up with mitigation measures to be monitored and reported in the annual audits. The proponent will commit adequate resources to ensure the effective implementation of the EMP.

2.5.2 Mitigation Measures for Land and Soil Environment

1. All batteries will be inspected for physical damage prior to being accepted for refurbishment. Leaking batteries should be placed in acid-resistant containers. The number of stored batteries should be controlled. There should be prominent hazard warnings,
2. Used lead-acid batteries will be transported as hazardous waste,
3. All workstation floors shall be resining impermeable flooring so as to prevent liquids penetrating into the soil,
4. All operations shall be strictly limited at the resin impermeable floor workstations so as to prevent liquids penetration into the soil,
5. Preferably colour coded waste bins or an equivalent shall be provided strategically at the workplace to facilitate solid waste management,
6. Contract a licensed waste handler to collect and dispose the solid waste,
7. Solid waste production and disposal records shall be kept at the workplace for future reference,
8. Process related liquid waste by design shall be isolated from the black and grey-water streams:
9. The process wastewater will be neutralized before being directed into the plant's designated NEMA licensed septic tank.
10. Solid waste management at the facility shall be strictly guided by the provisions of the Environmental Management and Coordination (Waste Management) Regulations, 2006, and
11. Liquid waste management at the facility shall be strictly guided by the provisions of the Environmental Management and Coordination (Water Quality) Regulations, 2006.

2.5.3 Mitigation Measures for Noise Environment

1. Delivery of raw materials, excavation and construction work should be limited to day time hours only between 8am to 5pm.
2. Locate machinery that are likely to produce noise as far as practical from neighboring properties.

3. Procure, provide and enforce the use of earmuffs to workers who will work within peak noise producing areas and visitors accessing the same areas.
4. Sensitize truck drivers to avoid unnecessary hooting and running of vehicle engines.
5. Comply with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.

2.5.4 Mitigation measures for Air Pollution

1. Procure, provide and enforce the use of dust masks to the workers and visitors to the project site.
2. Install dust screens around the project site during construction.
3. Sprinkle water at the excavation areas to suppress dust.
4. Use of serviceable machinery/equipment and trucks.
5. Monitor fugitive emissions to ensure compliance with the limits set under the First Schedule of the Environmental Management and Coordination (Air Quality) Regulations, 2014.
6. Comply with Environmental Management and Coordination (Air Quality) Regulations, 2014.

2.6 Project Budget

The project cost has construction phase that will cost Ksh.66,200,000 and All Equipment's for plastic recycling will cost 27,700,000 making a total cost for the proposed project **Ksh.93,900,000 (Ninety-three million, nine hundred thousand only)** as per the Bill of Quantity attached to this report.

2.7 NEMA Statutory fee

The environmental impact assessment and audit (amendment) regulations require the proponent to pay 0.1% of the total cost of the project minimum of Kshs.10,000. As per the reinstatement of EIA and related fees starting from 1st June 2022. As per the BQ the proponent will pay **Kshs. 93,900**.

CHAPTER THREE

3.0 PROPOSED PROJECT SITE LOCATION BASELINE CONDITIONS

The proposed project lies on a block of land measuring 58acres with title deed of reference numbers Lr Kjd/Kaputiei North/33878 with the proposed construction site bounded by coordinates Latitude -1.753159, and Longitude 36.924228. The proposed site location is located in Enkirgirri Village, Olmerrui Sub-Location, Isinya Location, Kajiado County.

3.1 Baseline Information of Kajiado County

Kajiado County is among the 47 Counties established in 2013 Constitution of Kenya 2010. The County is Number 034 located in Rift valley region and boarders Narok County to the west, Nakuru County, Kiambu County and Nairobi County to the North, Machakos County, Makueni County and Taveta County to the East and Tanzania to the South. County is inhabited mostly by Masai and all other Communities given proximate to the City of Nairobi. The Masai are predominantly pastoralists and the county is endured with wildlife. The County is managing Amboseli National Park.

Kajiado County is among the Arid and Semi-Arid (ASAL) counties characterized with low rainfall. The County's level of absolute poverty is estimated at 36.9% percent compared to the national average of 36.1 percent as per 2019 census.

The County is divided into five (5) sub-counties namely; Kajiado Central, Kajiado North, Kajiado East, Kajiado West and Kajiado South.

3.2 Demographic Feature

According to the 2019 population and housing census report, Kajiado County has a total population of 1,117,840 million People, up from 687,312 thousand people as per the 2009 census. Kajiado Central Sub-County where the proposed project site lies has a population of 161,862 comprised of 81,514 males, 80,343 females and 5 inter-sex people. The distribution of the population is influenced by availability of water as settlements are concentrated along water points, near urban and rural trading centers as well as along major roads. The Masai form the bulk of the population but other ethnic groups such as the Kamba and Kikuyu have infiltrated the area.

3.3 Climate and vegetation cover

Kajiado County experiences a bi-modal rainfall pattern. The short rains fall between October and December while the long rains fall between March and May. The bimodal rainfall pattern is not uniform across the County. The long rains (March to May) are more pronounced in the western part of the county while the short (October to December) rains are heavier in the eastern

part.

The rainfall amount ranges from as low as 300mm in the Amboseli basin to as high as 1250mmin the Ngong hills and the slopes of Mt. Kilimanjaro.

Temperatures vary both with altitude and season. The highest temperatures of about 34ºC are recorded around Lake Magadi while the lowest of 10ºC is experienced at Loitokitok on the eastern slopes of Mt. Kilimanjaro. The coolest period is between July and August, while the hottest months are from November to April. Figure 10 below shows the average temperature and rainfall distribution for Kajiado County.

Enkirgirri village lies in a semi-arid zone thus the vegetation consists of grasses, shrubs, herbs and acacia trees (Figure 2.2). The fauna is comprised majorly of birds.

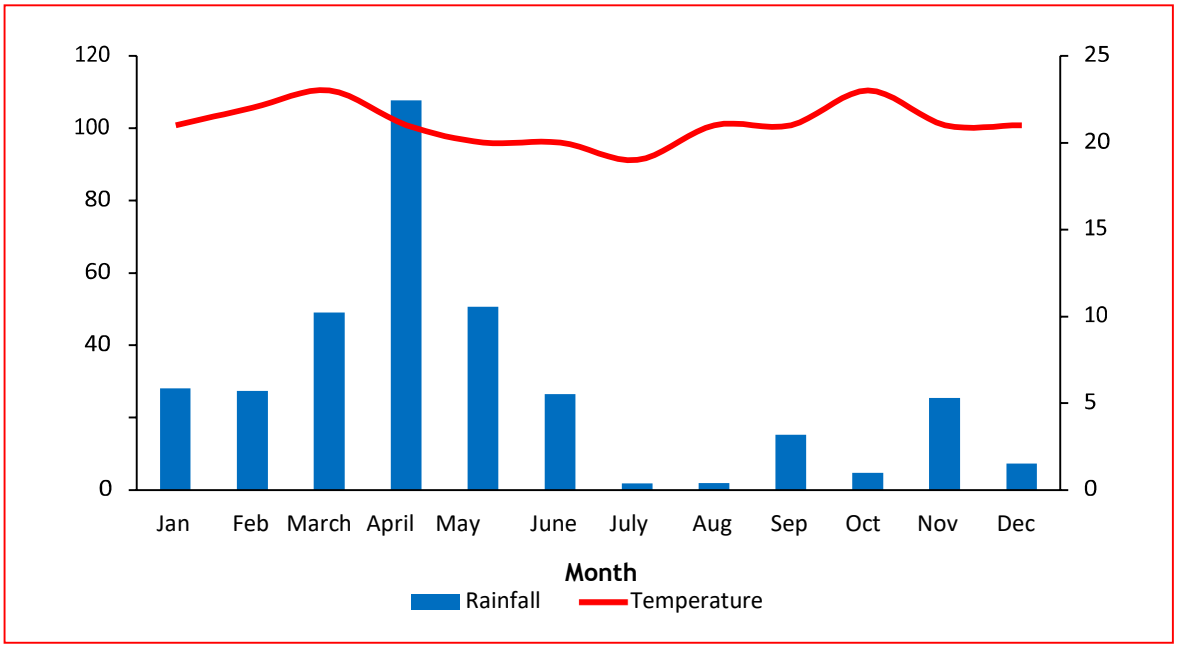


Figure ; Average rainfall and temperature distribution for Kajiado County in 2020 (Source: World Weather Online, 2023).

3.4 Topography

The main physical features in Kajiado County are plains, valleys and occasional volcanic hills from an altitude of 500 m above sea level at Lake Magadi to 2500 m above sea level in Ngong Hills. The landscape within the county is divided into Rift Valley, Athi Kapiti plains and Central Broken Ground. Enkirgirri area lies within the central broken ground stretching 20km to 70km wide from the North-eastern boarder across the County to the South-west where altitude ranges from 1220m to 2073m above sea level.

3.5 Land use patterns and socio-economic activities

Land use patterns in Enkirgirri area feature nomadic pastoralism, livestock rearing, educational and industrial establishments, subsistence agriculture and sparse settlements. The bulk of the population in the County practice nomadic pastoralism owing to the dry weather conditions. The main livestock types reared include goats and sheep. Subsistence agriculture is carried out in small areas by only non-indigenous people in the southern and western parts of the County along rivers and springs. Tourism is a strength that Kajiado holds dear through the current progress with Amboseli National Park.

3.6 Infrastructure

3.6.1 Water resources

Kajiado County is an Arid and Semi-Arid Land (ASAL) characterized by an acute shortage of clean and safe water for drinking and other domestic uses. Enkirgirri area, where the proposed project site lies, is served by a borehole supply already drilled at the site.

The main sources of water in the rural areas are water pans, dams and protected springs with the most reliable source being boreholes. Most of the water sources are fully recharged during the long rains season. There are numerous shallow wells, which provide reliable water supplies, but they are not protected. Most of the rivers are seasonal. Ground water occurs in different and varied rock conditions depending on the geological formation. The proposed project will source water from a borehole and supplemented by rainwater harvesting and natural pond system.

3.6.2 Transport

Kajiado County is served by a well-established network of earth, murram and bitumen roads. The Standard Gauge Railway (SGR) traverses the county through parts of Kajiado East and North. The metre gauge railway is used as a means of transport for soda-ash and other by-products and as well serving residents with commuter services in towns and areas such as Singiraine, Kenya Marble Quarries (KMQ), Kajiado and Elangata-Wuas. Additionally, there are seven airstrips in Kajiado County, with at least one in each Sub- County. The proposed project site lies along Olenkurian road.

3.6.2 Power

The proposed project site is currently connected with KPLC LTD's power. But the proponent intends to install a solar power plant at the proposed site.

3.6.3 Baseline environmental data

3.6.3.1 Ambient air quality measurements

There were notable gaseous concentrations of ozone (O3) and Carbon monoxide (CO) within the project site. Nitrogen dioxide (NO2) and Sulfur dioxide (SO2) concentrations remained below detection limits (<0.001ppm). Notable levels of particulate matter (PM10 and PM2.5) were also detected. However, the gaseous and particulate parameters measured were all within the stipulated standards under the First Schedule of Environmental Management and Coordination (Air Quality) Regulations, 2014 (Table 2).

Table; Baseline air quality measurements for the proposed project site (Source: Airsense Environmental Lab Ltd, 27th October 2023).

Baseline Ambient Air Measurement Report - Associated Battery Manufacturers (E.A) Ltd
27th October 2023

4.0 RESULTS

Table 4: PM10 Analysis Results

Location	Time (hrs)	Concentration µg/m³			WHO Air Quality Guidelines PM_{10}	EMCA (Air Quality) Reg. 2014
		AVG	MAX	MIN		
MP1	24hrs	7.0	12	5	50 µg/m³ 24hrs	50 µg/m³ 24hrs
MP2	24hrs	7.5	23	4		
MP3	24hrs	7.0	13	4		
MP4	24hrs	6.6	10	4		

Table 5: PM2.5 Analysis Results

Location	Time (hrs)	Concentration µg/m³			WHO Air Quality Guidelines PM_{10}	EMCA (Air Quality) Reg. 2014
		AVG	MAX	MIN		
MP1	24hrs	4.2	6	2	25 µg/m³ 24hrs	75 µg/m³ 24hrs
MP2	24hrs	3.0	11	2		
MP3	24hrs	2.8	6	2		
MP4	24hrs	2.4	4	2		

From the results analysis in tables 4 & 5 above, all the points sampled for both PM_{10} and $PM_{2.5}$ were within the Environmental Management and Co-ordination (Air Quality), Regulations, 2014 and WHO guidelines.

Source: The Baseline Ambient air measurement report

3.6.3.2 Baseline Environmental Noise Level

The results of noise level measurements were within the limits stipulated under the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 (Table 3). No activities were ongoing at the time of measurements. Occurring wind and breeze, and the rustling vegetation at the site were the likely sources of noise emissions.

Table 3: Baseline noise level measurements for the proposed project site (Source: Airsense Environmental Lab Ltd, 27th October 2023).

Table 0-1: Associated Battery Manufacturers (E.A) Ltd Diurnal Baseline Environmental Noise Level Results 27-10-2023

ID	Point Of Measurement	LAeq	LAmax	LAmin	LApeak	Limits
TAG 001	Tank Area	**36.5**	70.2	58.1	33.2	55dB
TAG 002	Center of the proposed project area	**35.7**	69.4	58.4	32.9	
TAG 003	Gate area	**36.8**	69.8	58.5	33.5	
TAG 004	Receptor point located outside the project area; point nearest to residual area	**36.4**	69.7	58.6	33.1	

Source: The Baseline environmental noise measurement report

CHAPTER FOUR

4,0 POLICY, LEGAL AND ADMINISTARTIVE FRAMEWORK

4.1 General Overview

Kenya has a policy, legal and administrative framework for environmental management. Under the framework, the National Environment Management Authority (NEMA) is responsible for ensuring that environmental impact assessments (EIAs) are carried out for new projects and environmental audits on existing facilities as per the Environmental Management and Coordination Act 2015 EIA studies are carried out in order to identify potential positive and negative impacts associated with the proposed project with a view to taking advantage of the positive impacts whilst providing effective mitigation measures for the negative effects. The requirements on EIA are contained in sections 58 to 67 of the Act. According to section 68 of the environmental management and coordination Act (EMCA) 2015, the Authority shall be responsible for carrying out environmental audits on all activities that are likely to have a significant effect on the environment.

The government has established regulations to facilitate the process on ESIAs and environmental audits. The regulations are contained in the Kenya Gazette Supplement No. 56, legislative supplement No. 31, and legal notice No. 101 of 13th June 2003. In the past, the government has established a number of National policies and legal statutes to enhance environmental conservation and sustainable development.

4.2 Policies

4.2.1 The Constitution of Kenya, 2010

The Constitution of Kenya is the supreme law of the Republic of Kenya and binds all persons and all State organs at all levels of government. It provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectorial legislative documents are drawn. In relation to environment, Article 42 of Chapter 4, the Bill of Rights, confers to every person the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative measures, particularly those contemplated in Article 69, and to have obligations relating to the environment fulfilled under Article 70.

Chapter 5 of the new constitution provides the main pillars on which the 77 environmental statutes are hinged and covers "Land and Environment" and includes the aforementioned

articles 69 and 70. Part 1 of the Chapter dwells on land, outlining the principles informing land policy, land classification as well as land use and property. Part 2 of the Chapter directs focus on the environment and natural resources. It provides for a clear outline of the state's obligation with respect to the environment. The Chapter seeks to eliminate processes & activities likely to endanger the environment. There are further provisions on enforcement of environmental rights as well as establishment of legislation relating to the environment in accordance to the guidelines provided in this Chapter. In conformity with the Constitution of Kenya 2010, every activity or project undertaken within the Republic of Kenya must be in tandem with the state's vision for the national environment as well as adherence to the right of every individual to a clean and healthy environment.

4.2.2 Vision 2030

This is the sole government development blue print up to the year 2030. The overall goal of the Vision 2030 is to transform Kenya into a middle-income country providing a high quality of life to all its citizens by the year 2030. The Vision is anchored on three pillars, namely: The Economic Pillar which targets sustained economic growth of 10% per annum; the Social Pillar which seeks to create a just and cohesive society enjoying equitable social development in a clean and secure environment; and the Political Pillar whose aspiration is for Kenya to enjoy issue-based, people centered, results oriented and accountable democratic political system. The three pillars are underpinned by the Foundations for Socio-economic Transformation, which seek to provide the necessary support for Kenya's social, economic and political development. The Vision spells out the following strategies which are associated with the role of the Judiciary:

- Aligning the national policy and legal framework with the needs of a market-driven economy, human rights and gender equality commitments.
- Increasing access and quality of services available to the public and reducing barriers to service availability and access to justice.
- Streamlining functional capability (including professionalization) of legal and judicial institutions to enhance inter-agency cooperation.
- Inculcating a culture of compliance with laws, cultivating civility and decent human behavior between Kenyans and outsiders.

The Vision outlines judicial and legal reforms as a flagship project that relates to reforms in the rule of law and enhancement of the Bill of Rights. The Vision further outlines reforms in

Government institutions, especially those involving public participation in governance, and those connected to transparency and accountability within the public sector.

4.2.3 National Environmental Action Plan (NEAP) 48

According to the Kenya National Environment Action Plan (NEAP, 1994) the Government recognized the negative impacts on ecosystems emanating from industrial, economic and social development Programmes that disregarded environmental sustainability. Following this, establishment of appropriate policies and legal guidelines as well as harmonization of existing policies have either been accomplished and/or are in the process of development. Under the NEAP process Environmental Impact Assessments were introduced targeting the industrialists, business community and local authorities.

4.2.4 National Policy on Water Resources Management and Development

While the National Policy on Water Resources Management and Development (1999) enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. It, therefore, calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. Industrial, business and large scale agricultural development activities, therefore, should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating there from. The same policy requires that such projects should also undergo comprehensive EIAs that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighborhood and further downstream are not negatively impacted by the discharges.

As a follow-up to this, EMCA 2015 requires annual environmental audits to be conducted in order to ensure that mitigation measures and other improvements identified during Elias are implemented. In addition, the policy provides for charging levies on wastewater on the basis of quantity and quality. The "polluter-pays-principle" applies in which case parties contaminating water are required to meet the appropriate cost of remediation. The policy provides for establishment of standards to protect water bodies receiving wastewater, a process that is ongoing.

4.2.5 Sessional Paper on Environment and Development (No. 6 of 1999)

The key objectives of the Policy include: **i.e.** to ensure that from the onset, all development policies, Programmes and projects take environmental considerations into account, **ii.** To ensure that an independent environmental impact assessment (EIA) report is prepared for any industrial venture or other development before implementation, iii. To come up with effluent treatment standards that will conform to acceptable health guidelines. 49 Under this paper, broad categories of development issues have been covered that require a "sustainable development" approach. These issues relate to waste management and human settlement. The policy recommends the need for enhanced re-use/recycling of residues including wastewater, use of low or non-waste technologies, increased public awareness raising and appreciation of a clean environment. It also encourages participation of stakeholders in the management of wastes within their localities. Regarding human settlement, the paper encourages better planning in both rural and urban areas and provision of basic needs such as water, drainage and waste disposal facilities among others.

4.2.6 International Obligations- Multilateral Environmental Agreements

The evolving system of international conventions, agreements and treaties has provided important framework for waste management policies across the globe. The current global environmental governance is to a large extend a result of the Rio Earth Summit of 1992 and Agenda 21 which amongst others advocates for four major waste related Programmes:

i) Minimizing wastes
ii) Maximizing environmentally sound waste disposal and treatment
iii) Promoting environmentally sound waste disposal and treatment
iv) Extending waste service coverage

4.3 Legal Aspects

The key national laws that govern the management of environmental resources in the country have been briefly discussed in the following paragraphs. Note that wherever any of the laws contradict each other, the Environmental Management and Coordination Act 1999 supersedes.

4.3.1 The Environment Management and Coordination Act, 2015 amendment

The Environmental Management & Coordination Act, 2015 amendment generally provides for enjoyment by every person in Kenya to a clean and healthy environment while also placing responsibility to safeguard and enhance the environment. According to the Act an Environmental impact assessment study needs to be carried out on projects specified in the

second schedule of the Act that are likely to have a significant impact on the environment. This proposed project has been rightly classified among those that must be subjected to an ESIA study under the second schedule of the Act. It further stipulates that operators of projects should carry out annual environmental audits in order to determine level of compliance with statements made during the EIA. The audit report should be submitted to NEMA. The Act prohibits discharging or applying poisonous, toxic, noxious or obstructing matter, radioactive or any other pollutants into aquatic environment. Its further places responsibility on operators of project which discharges effluent or other pollutants to submit to NEMA accurate information about the quantity and quality of the effluent and to seek effluent discharge licenses.

4.3.2 Environmental Management and Co-ordination (Water Quality) Regulations, 2006 - Legal Notice No. 120

These regulations are established under the Environmental Management and Coordination Act. These regulations apply to drinking water, water used for industrial, agricultural and recreational purposes, including water used for fisheries and wildlife, among others. These regulations prohibit discharge or application of any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants into water meant for fisheries, wildlife, recreational purposes or any other purposes. The regulations provide for the creation of a buffer zone for irrigation schemes of at least fifty (50) metres in width between the irrigation scheme and the natural water body.

4.3.3 The Environmental (Impact Assessment and Audit) Regulations, 2019

The EMCA makes it mandatory for any person being a proponent of a project to submit a project report to NEMA in a prescribed format. Of immediate relevance regarding conducting EIA are Part VIII, Section 58 (1&2) and the Second Schedule of the EMCA. Section 58 (1) states that: “Notwithstanding any approval, permit of license granted under this Act or any other law in force in Kenya, any person, being a proponent of the project, shall before financing, commencing, proceeding with, carrying out, executing or conducting or causing to be financed, commenced, proceeding with, carried out, executed or conducted by another person any undertaking specified in the Second Schedule to this Act, submit a project report to the Authority in the prescribed form, giving the prescribed information and which shall be accompanied by the prescribed fees”. Section 58(2) states that the proponent of a project shall undertake or cause to be undertaken at his own expense an environmental impact assessment

study and prepare a report thereof. In accordance to the Section 147 of the above Act, Environmental and (Impact Assessment and Audit) Regulations, 2019 have now been formulated and gazetted in Kenya. Gazette Supplement No. 56. Part IV, Section 18 (1) states that a proponent shall submit to the Authority, an environmental impact assessment study report incorporating but not limited to the following information:

i) The proposed location of the project;
ii) A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project;
iii) The objectives of the project;
iv) The technology, procedures and processes to be used, in the implementation of the project;
v) The materials to be used in the construction and implementation of the project;
vi) The products, by-products and waste generated by the project;
vii) A description of the potentially affected environment;
viii) The environment effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated;
ix) Alternative technologies and processes available and reasons for preferring the chosen technology and processes;
x) Analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies.
xi) An environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment; including the cost, time frame and responsibility to implement the measures;
xii) Provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities or major industrial and other development activities;
xiii) The measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies;
xiv) An identification of gaps in knowledge and uncertainties which were encountered in compiling the information;
xv) An economic and social analysis of the project;

xvi) An indication of whether the environment of any other state is likely to be affected and the available alternatives and mitigating measures; and

xvii) Such other matters as the Authority may require

4.3.4 The Water Act, 2002

This Act has placed overall responsibility for water management with the Ministry of Water Resources and Irrigation. This Act has provided for the formation of a Water Resources Authority (WRA) responsible for the management of lakes, aquifers and rivers, among other functions. The Act empowers the minister in charge to promote the conservation and proper use of water resources and the conservation of water catchments, water sources and courses. It further prohibits the draining or interfering with wetlands for any purpose without proper authority.

4.3.5 The Water Resources Management Rules, 2007- Legal Notice No. 171

These rules are made pursuant to the Water Act. The rules requires permission by way of obtaining an abstraction permit from the prescribed authority (WRMA) by any person or institution seeking to abstract water from defined watercourses after payment of prescribed fees. It further requires permit holders for abstraction of water for irrigation purpose to renew after every 5 years. It prescribes that permit fees are based on the surface area to be irrigated. The rules restrict the permit holder only to use the flood flow for irrigation and will construct a reservoir to store enough water to irrigate the area specified in the permit for 90 days. The Act has also provided for the formation of Water Resources Users Associations (WRUA) in order to ensure sustainable use of water management schemes.

The rules requires the permit holder storing or arresting the flow of water by means of a dam or weir located on a body of water or watercourse to provide at a depth measured from the top of the dam or weir, an outlet, controlled by a valve, sluice gate or other device, which is capable of being operated at all stages of the flow of such body of water or watercourse so that the normal flow, or other flow as required by the Authority, of such body of water or watercourse can be passed through or around such dam or weir at all stages to enable for compensation of flow. The rules also states that authorized water users to be appurtenant to land which should be proved by way of an authentic title deed, lease agreement, easement, way leaves or a letter from the land owner or community endorsed by the provincial administration. The rules also require permit holder to pay to the designated Authority water use charges on the basis of the water abstracted, diverted, obstructed or used including energy derived from a water resource.

4.3.6 The Public Health Act (Cap. 242)

This Act prohibits any person or institution from causing nuisance or conditions liable to be injurious or dangerous to human health. It further forbids discharge of any noxious matter or wastewater flowing or discharged from any premises into a public street or into the gutter or side channel or watercourse, irrigation channel or bed not approved for discharge.

4.3.7 The Penal Code, Cap 63

The Penal Code prohibits any person or institution from voluntarily corrupting or foiling water for public springs or reservoirs, rendering it less fit for its ordinary use. In addition, the same act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons/institution in dwellings or business premises in the neighborhood or those passing along public way commit an offence.

4.3.8 Legal Notice 40 (Building, Operation & Work of Engineering) Rules 1984

These rules require the contractor to ensure health, safety and welfare of employees and states. It further requires the main contractor to notify the chief inspector within 7 days of commencing or undertaking building operation or works of engineering. The rules require that walls of excavations deeper than 1.2m be reinforced with timber of suitable quality or with other suitable material to prevent so far as is reasonable practicable the danger or injury resulting from a fall or dislodgement of earthwork. The rules further require that a scaffold of good construction and suitable strength shall be made available for any construction site where working at height is to be undertaken. A first aid box shall also be provided and be distinctively marked 'FIRST AID' and placed under the charge of a responsible person whose name shall be plainly indicated in a prominent place or near the box.

4.3.9 Penal Code Act (Cap.63)

Section 191 of the penal code states that if any person or institution that voluntarily corrupts or foils water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighborhood or those passing along public way, commit an offence.

4.3.10 Sustainable Waste Management Act 2022

This Act, consisting of 35 articles and divided into ten Parts, provides for the establishment of a legal and institutional framework for the sustainable management of waste; for ensuring the

realization of the constitutional provision on the right to a clean and healthy environment and for connected purposes. The Act covers: domestic waste, waste electronic equipment, extended producer responsibility, hazardous waste, industrial waste, organic and non-organic waste, payment for environmental service, pollution, private sector entity, producer, public entity, recycle, re-use, recovery, sustainable waste management, waste management facility. The Act identifies the following objectives: sustainable waste management promotion; improving the health of all Kenyans by ensuring a clean and healthy environment; reduction of air, land, fresh water and marine pollution; ensuring the delivery of waste service; creating an enabling environment for employment in the green economy in waste management, recycling and recovery; circular economy practices promotion; mainstreaming resource efficiency principles in sustainable consumption; improving responsible public behaviour on waste and environment. The Act is based on the following principles: precautionary principle; polluter pays principle; payment for ecosystem services; zero waste principle.

CHAPTER FIVE

5.0 ENVIRONMENTAL ISSUES

5.1 Identification Analysis and Appraisal of Impacts

In order to accurately identify the proposed project impacts, the following issues were considered pertinent and important for the coverage.

5.2 Physical Environment (Biophysical Impacts)

i) Water quality aspects for both surface water sources like, storm water, and other related aspects.

ii) Soil conditions, soil contamination and landscape alterations/degradation (based on aesthetic aspects) associated with the proposed project.

iii) Drainage patterns especially in relation to wastewater effluents, chemicals, oil spillages, discharges channeled into the drainage ditches.

iv) Air quality aspects especially atmospheric emissions from the proposed project operations.

v) Noise and vibration (sonic factors) due to the mining and limestone processing activities.

5.2.1 Natural Environment

i) Natural flora and fauna from the adjacent ecosystem (i.e., effects to natural plants and animals where applicable).

ii) Adjacent water bodies, tributaries and streams-pollution indicators, impacts on water flow patterns and quality aspects, user interference and contamination.

5.2.2 Social welfare, Economic and Cultural Environment

i) Determination of implications to the human society distribution, demographic details, settlement patterns, changes to the cultural lifestyle and indigenous knowledge of the local society/public where applicable.

ii) Notable changes in land use systems and the general land utilization types where applicable.

iii) Aesthetic, landscape alterations and changes to infrastructural facilities, among others.

iv) Effects associated with the limestone mining and processing activities and related to handling and disposal of wastes generated during the operations.

v) Effects associated with income generation opportunities created by the project due to the upcoming operations.

vi) Introduction of nuisances, such as pests and related multiplication breeding sites

5.3 Environmental and Social Impacts identification and appraisal

The proposed project will have both socio-economic benefits and attendant negative environmental and social impacts. One of the key objectives of the ESIA process is to systematically assess the value of the benefits against the environmental and social concerns and provide measures to avoid, prevent or reduce the magnitude of the impacts. The following section identifies, predicts and analyzes these impacts and proposes mitigation measures to address them. The mitigation measures are based on several ESIA principles such as the entitlement to a clean and healthy environment and duty to enhance and safeguard the environment, polluter pays principle, precautionary approach and stakeholder involvement in addressing environmental and social challenges of the proposed Plastic Recycling and Battery casing manufacture Project.

5.3.1 Positive impacts of the proposed project

The proposed project's direct benefits include but are not limited to the following;

I. **Simulation of industrial development coherent with Kenya's Vision 2030.** Manufacturing ensures industrialization and development through the utilization of the country's resources to catalyze diversified industrial development. This is in line with the Kenya Vision 2030 which aims at harnessing resources for industrial development and transforming Kenya into a newly industrializing middle-income country.

II. **Mitigating the national and regional demand for battery products** .As Kenya strives for industrial and economic development, there is a corresponding increase in use of automobiles and powering using solar energy. The demand of batteries is going to increase bring in foreign exchange through export of batteries in the region and offering more job opportunities in the country.

III. **Providing employment opportunities.** During the project planning and design, the project proponent has already employed consultants including, engineers, geologists, chemists, social experts, lawyers, architects, engineers and ESIA consultants etc. During the construction and operational phases of the proposed project structures, several skilled and unskilled personnel from within and outside the local community will be employed to provide different services. As a result, many will benefit from improved livelihood and increased income from employment at the facility.

IV. **Income to the proponent**. The facility through its operations will accrue income to the proponent thus enabling expansion of business and creating more employment opportunities to the locals.

V. **A market for local goods and services**. The proposed project will be a market base for various goods and services required to run its operations. Goods include cement, sand and aggregate for construction works among others while services include energy, telecommunication and environmental audits among others.

VI. **Revenue to the government.** The government will get revenue in terms of taxes generated during the acquisition of statutory licenses. The construction material to be used during construction will also be taxable. Through the revenues generated, the government will be capable of financing its obligations to Kajiado County and the country at large

5.3.2 Anticipated negative environmental and social impacts

Against the background of positive impacts, the proposed project is expected to result in a number of negative environmental and social impacts at the various stages of implementation. These impacts include change in land use, loss of arable land, environmental risks of obtaining raw materials, impact on biodiversity, soil erosion and sedimentation, occupational safety and health risks, air and noise pollution, land degradation, effect on landscape and visual intrusions, thermal pollution, ground water pollution, water demand, effluent generation, fuel, oil and grease spills and leakages and energy demand.

5.3.2.1 Negative impacts at the plastic recycling and auxiliary amenities construction phase of the proposed project

5.3.2.1.1 Change in land use

The current land use of the land is agricultural. However, the proponent proposes to set up plastic recycling and battery casing manufacture which is inconsistent with the former land use.

Recommended mitigation measure

I. ***The proponent applied for and obtained a change of user from agricultural to industrial from the County Government of Kajiado and the Ministry of lands***

5.3.2.1.2 Loss of arable land

Local residents currently carry out subsistence farming of crops and pastoralism in some of the farm lands which is an important source of livelihoods. Implementation of the project would lead to total loss of the current crop grown and is therefore technically a threat to food security and loss of livelihood from keeping animals though the land in question is only 58 acres

Recommended mitigation measure

Compensated the land owners at market rates to engage in other livelihood activities.

5.3.2.1.3 Environmental risks of obtaining raw materials

Construction of Plastic recycling and Battery casing and construction of auxiliary facilities will require raw materials such as sand and cement, ballast, lining materials and steel bars / rods among others which will be sourced from the environment. These materials will have negative environmental impacts at their points of origin.

Recommended mitigation measures

The proponent should;

I. ***Source raw materials from sites that are licensed as per the Environmental Management and Coordination Act Cap. 387 of the Laws of Kenya***
II. ***Have a procurement plan based on the Bill of Quantities prepared by a Quantity Surveyor to avoid potential oversupply of materials and wastage.***
III. ***Sensitize personnel on wastage of construction materials. Remnants should be collected each day and re-used accordingly.***

5.3.2.1.4 Impact on the biodiversity

Sections of the proposed site will be cleared and some trees will be felled to pave way for construction which will disrupt the macro habitat and the species they support. Vegetation cover at the site provides several environmental and socio-economic benefits which include carbon sequestration, habitat for other organisms and prevention of soil erosion among others. There are species that are resistant to such disturbances while others are adversely affected to the extent of completely disappearing after foundation excavation. Endemic plants and animal species are most affected since they are very sensitive and they require specific environmental conditions, even the slightest disruption of their habitats can result in extinction or put them at high risk of being wiped out.

Recommended mitigation measures

I. ***Retain vegetation cover in areas that will not be excavated for construction.***

II. ***Plant more trees in the remaining land to increase tree cover (before project commencement).***

5.3.2.1.5 Soil erosion and sedimentation

Due to storm water runoff the soil will be loose susceptible to erosion. This will contribute to sedimentation within the adjacent water bodies. There is thus the need for appropriate development planning on the project site.

Recommended mitigation measures

I. ***Channel storm water into a pan or a small dam for storage and usage***

II. ***Direct roof catchment water into the pan or small dam***

5.3.2.1.6 Occupational health and safety risks

Workers who will be working in the mines, installation of the limestone processing plant and construction of auxiliary facilities, visitors to the project site and neighboring properties will be exposed to potential safety and health risks during construction activities. The potential safety risks will be from the use of machinery, risks from moving machinery, falling objects or even falls, air and noise pollution among others. These risks have a potential to cause disturbances, injuries, permanent disability or even death.

Recommended mitigation measures

I. ***Register the site as a workplace with the Directorate of Occupational Safety and Health Services (DOSHS)***

II. ***Obtain insurance cover for the workers at the site***

III. ***Provide adequate and appropriate Personal Protective Equipment (PPE) and enforce their use for both workers and visitors***

IV. ***Provide employees with correct tools and equipment for the jobs assigned and train on their use***

V. ***Ensure moving parts of machines and sharp surfaces are securely protected with guards to avoid unnecessary contacts and injuries***

VI. ***Provide first aid services and an emergency vehicle at the site***

VII. ***Regulate the entry of visitors to the construction site by deploying adequate security measures***

VIII. ***Comply with the provisions of the Environmental Management and Coordination (Air Quality) Regulations 2014 and Noise and Excessive Vibration Pollution (Control) Regulations, 2009.***

IX. ***Comply with the provisions of the Occupational Safety and Health Act, 2007***

5.3.2.1.7 Noise pollution

Disturbance or discomfort resulting from construction noise cannot be ruled out. Though the level of discomfort caused by noise is subjective, the most commonly impacts of increased noise levels are interference in oral communication and disturbance in sleep or during resting time. The proposed construction activities have the potential to emit noise levels of above comfortable limits of 60dB (A) during the day and 35dB (A) at night as per the Second Schedule of the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.

Recommended mitigation measures

I. ***All construction activities should take place during the day***

II. ***Delivery of raw materials, excavation and construction work will be limited to day time hours only between 8am to 5pm***

III. ***Locate machinery that are likely to produce noise as far as practical from neighboring properties***

IV. ***Provide and enforce the use of earmuffs to staff who will work within peak noise producing areas and visitors accessing peak noise producing areas***

V. ***Sensitize truck drivers to avoid unnecessary hooting and running of vehicle engines***

VI. ***Comply with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009***

5.3.2.1.8 Air pollution

Air pollution during the construction phase will be in form of dust and emissions. Dust will emanate from excavation works and concrete mixing whereas emissions will be from machinery use and vehicles accessing the site. The most relevant pollutant considered is particulate matter because of its potentially significant increase during the construction phase. Repairable particulate matter may present respiratory diseases, cause eye irritation and visual intrusion to workers, visitors to the project site and the neighbors if it is in excess of 100 µg/Nm3 as per the First Schedule of the Environmental Management and Coordination (Air Quality) Regulations, 2014.

Recommended mitigation measures

I. ***Install dust screens around the project site during construction***
II. ***Sprinkle water at the excavation areas to suppress dust***
III. ***Use low sulphur fuels to power vehicles and site machinery***
IV. ***Use of serviceable machinery/equipment and trucks***
V. ***Procure and enforce the use of dust masks to workers and visitors to the project site***
VI. ***Comply with the provisions of the Environmental Management and Coordination (Air Quality) Regulations, 2014***

5.3.2.1.9 Water demand and effluent generation

The construction activities will utilize substantial quantities of water for mixing and casting concrete, drinking and sanitation purposes which will lead to an increased demand for water. Based on the projected workforce over5 people at construction, domestic water demand will be approximately 0.4m^3 per day and will be sourced from water bowsers. Seventy percent (70%) of domestic water use will generate effluent which will need to be managed efficiently.

Recommended mitigation measures

I. ***Sensitize the workers on the need to conserve available water resources***
II. ***Procure and deliver to the site one mobile toilets from a NEMA licensed waste contractor for use by the workers during the construction***
III. ***Comply with the provisions of the Environmental Management and Coordination (Water Quality) Regulations, 2006***

5.3.2.1.10 Solid waste generation

Site preparation and related construction activities are expected to generate significant quantities of solid waste such as rock rubbles, cuttings and rejected materials among others. Workers at the site will generate domestic wastes such as food left overs, plastics and wrappings among others. Poor disposal of solid waste is an eyesore, can harbor pests and disease-causing pathogens as well as pollute soil and groundwater.

Recommended mitigation measures

IV. ***Procure and strategically place adequate solid waste collection bins with a capacity for segregation within the construction site***

V. ***Procure a sizeable central solid waste collection bin with chambers to accommodate separated waste***

VI. ***Create awareness on best waste management practices among the workers i.e. on the process of solid waste collection, segregation and proper disposal***

VII. ***Procure the services of a NEMA licensed waste handler to dispose of the solid waste***

VIII. ***Comply with the provisions of the Environmental Management and Coordination (Waste Management) Regulations, 2006***

5.3.2.1.11 Fuel, oil and grease spills and leakages

Machinery used for construction activities and vehicles delivering materials to the site will need petroleum products such as fuel, oils, lubricants etc. There is potential for leakage and spillage during fueling, servicing and maintenance of machinery and vehicles. A release of petroleum products to the environment threatens ground and surface waters thereby endangering drinking water supplies.

Recommended mitigation measures

I. ***Prevent oil/grease spillages by employing skilled mechanics***

II. ***Procure oil spill containment kits and train workers on the use***

III. ***Contract a NEMA licensed waste oil handler to manage the waste oil from the construction site***

5.3.3 Negative impacts at the operational phase of the proposed project

5.3.3.1 Land degradation

Land degradation mainly results from stripping of the topsoil and excavation for foundation construction. This will tamper with the soil structure exposing the site to possible landslides and soil erosion as well as interrupting the continuity of open space.

Recommended mitigation measures

I. ***Side mitigation by planting of indigenous plant species within the 58 acres that will not be developed***

5.3.3.2 Generation and disposal of waste

There will be waste generation during construction and operation phase

Recommended mitigation measures

Handle any waste generation throughout the project circle as per waste management regulations of 2006

5.3.3.3 Effects on landscape and visual intrusions

Stockpiles of waste plastic for recycling have a negative effect on the landscape by causing visual intrusion. This will need to be managed

Recommended mitigation measures

I. ***The stock piles should be stored in a store that does not expose the material to wind and sun***

5.3.3.4 Impact on biodiversity

Sections of the proposed site will be cleared to pave way for construction of the plant and the pan /dam. There are species that are resistant to such disturbances while others are adversely affected to the extent of completely disappearing from the construction zone. Endemic plant and animal species are most affected since they are very sensitive and they require specific environmental conditions, even the slightest disruption of their habitats can result in extinction or put them at high risk of being wiped out.

Dust produced will also have physical effects on the surrounding vegetation such as blocking and damaging internal structures hence impacting on their physiological activities. Vegetation provide habitat for organisms. They also protect ground surface from wind and water erosion and stabilizes other physical environmental attributes such as microclimate, water and soil moisture regimes which in turn influence organisms' abundance.

Recommended mitigation measures

I. ***Side mitigation within the 58 acres so as to restore biodiversity that was cleared***

5.3.3.5 Occupational safety and health risks

Recycling of plastic and manufacture of battery casing items pose potential threats to the health and safety of workers on site. This may be in the form of air and noise pollution, fumes from machinery and vehicles accessing the site, accidents from machinery and equipment, injuries that may result and accidental falls among others.

Recommended mitigation measures

I. ***Register the site as a workplace with the DOSHS***

II. ***Provide and enforce appropriate PPE among workers and visitors to the site***

III. ***Provide a fully equipped first aid boxes, first aid services and emergency vehicle at the site***

IV. ***Provide adequate training to staff on health and safety***

V. ***Provide the correct equipment to employees for the jobs assigned and trained on their use***

VI. ***Designate a fire assembly point within the facility***

VII. ***Regulate access to the site by deploying adequate security measures and fencing where appropriate to protect workers, local community members and livestock from potential accident***

VIII. ***Comply with the provisions of the Occupational Safety and Health Act, 2007***

5.3.3.6 Air pollution

Air pollution will mainly result from dust emissions during the operation phase of recycling and production of plastic waste casing and vehicular movement. During the handling of waste plastic material and crushing and melting there will be generation of particulate. In addition, exhaust fumes produced by the heavy machinery and HCVs accessing the site will increase air pollution. Fugitive dust and emissions present respiratory hazard, cause eye irritation and visual intrusion to the workers, visitors to the site as well as the neighbors if in excess of 100 µg/m3. It also reduces growth of vegetation and hampers aesthetics of the area. The intensity of the dust emissions reaching the neighborhood is dependent on their location relative to the plant, distance and the wind direction (site meteorology)

Recommended mitigation measures

I. ***Locate plant as far as practical from neighboring properties***

II. ***Retain existing vegetation in areas which are not earmarked for construction to act as dust screens and a buffer zone between the proposed project and the settlements***

III. ***Sprinkling water at the plant site and access road on a daily basis as often as necessary to minimize re-entrainment of fugitive particulate matter***

IV. ***Provide adequate dust masks to workers and enforce on their use***

V. ***Restrict the speed of vehicles to 20KPH and place a signage at the main gate***

VI. ***Monitor fugitive emissions to ensure compliance with the limits set under the First Schedule of the Environmental Management and Coordination (Air Quality) Regulations, 2014***

VII. ***Comply with the provisions of the Environmental Management and Coordination (Air Quality) Regulations, 2014***

VIII. ***Comply with the provisions of the Occupational Safety and Health Act, 2007***

5.3.3.7 Noise and excessive vibration pollution

During operation phase there will be production of noise. These include excessive vibrations mainly from crushing, movement of HCVs and machinery operations during loading, offloading, feeding, vibration of screens and belt conveyor movement among others. The noise levels produced may be above the standards stipulated under the Third Schedule of the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. This may lead to hearing impairments to workers, visitors to the site and neighbors. Notably, excessive vibrations may cause cracks and weakening of the neighboring buildings.

Recommended mitigation measures

I. ***Locate the plant as far as practical from neighboring properties***
II. ***Provide and enforce the use of earmuffs to all workers and visitors accessing noisy areas of the facility***
III. ***Ensure that the vibration levels do not exceed 0.5 centimeters per second beyond the source property boundary***
IV. ***Conduct noise mapping to inform mitigation measures***
V. ***Comply with the provisions of the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009***

5.3.3.8 Fire risks and emergency preparedness

Fire risks and emergencies at the proposed facility can occur due to operational negligence, electrical faults and spillage of flammable materials. This can result to injuries, loss of lives and property. The proponent needs to put in place measures to prevent the fire incidences.

Recommended mitigation measures

I. ***Formulate a fire and emergency response action plan and communicate it to the staff***
II. ***Provide suitable and adequate fire-fighting equipment such as fire extinguishers, fire hose reels, smoke detectors, fire alarms and fire hydrants at appropriate locations within the development***
III. ***Fire-fighting equipment should be serviced quarterly by fire service providers***
IV. ***Provide fire exits within the development***
V. ***Designate a fire assembly point within the facility***

VI. ***Conduct fire drills occasionally to ensure workers remain alert on what to do in the unfortunate incidences of fire outbreaks***

VII. ***Train workers on fire safety on an annual basis***

VIII. ***Conduct inspection of electrical installations and maintain records of such inspections, faults detected and action taken***

IX. ***Comply with the provisions of the Occupational Safety and Health Act, 2007***

5.3.3.9 Thermal pollution

The key exposures to heat in plastic recycling plant occurs during the operation of the melting the plastic waste thus being exothermic reaction. During the calcination reaction, enormous amount of heat is required to melt the plastic waste. Upon hydration, this will expose the workforce to lots of heat leading to heat exhaustion and stroke among other heat related illness.

Recommended mitigation measures

I. ***Use cooling towers before releasing heat to the environment***

II. ***Reduce the number of working hours for the employees operating around melting boilers***

III. ***Provide and enforce use of PPE such as insulated gloves and shoes for personnel accessing high heat areas***

IV. ***Shield surfaces where workers 'proximity and close contact with hot equipment is expected***

V. ***Implement specific personal protection safety procedures to avoid potential exposure to exothermic reactions***

5.3.3.10 Ground and surface water pollution

During the cleaning process, there is risk of traces of lead contaminating the water used in case of broken batteries,

During draining of acid from the batteries there is risk of spillage of sulphuric acid contaminated with lead,

When industrial batteries are opened up for cleaning there is risk of lead contaminates spillages, and

These spillages if in significant quantities and if not well managed may be washed during cleaning and find their ways into water bodies leading to pollution.

Recommended mitigation measures

I. ***Used lead-acid batteries should be transported as hazardous waste. The batteries should be kept upright and separated by cardboard or other non-conducting***

material and then placed in sealed containers or otherwise secured, e.g., on pallets covered with shrink wrap, to prevent them moving about.

II. ***The main technical staff will undergo training from the equipment supplier prior to set-up,***

III. ***All staff to undergo sensitization and training on safe practices within the plan,***

IV. ***The activities within the plan are automated in a closed system to reduce the risk of spillages,***

V. ***All the acid is captured within the system should be neutralized before channeling to the septic tank reducing the pollution risk.***

5.3.3.11 Water demand and effluent generation

Facility will exert pressure on water for drinking and sanitation purposes, cooling of machinery, dust suppression and general housekeeping. Seventy (70%) of the domestic water use will be generated as effluent while the rest will seep into the ground areas within the site. Effluent generated will need to be disposed (mitigated) of appropriately.

Recommended mitigation measures

I. ***Sensitize the staff on the need to conserve the available water***

II. ***Install a bio-digester for proper treatment of the effluent***

III. ***Contract a NEMA licensed laboratory to undertake quarterly monitoring of the quality of effluent to ascertain compliance with the standards for discharge into the environment***

IV. ***Apply for and obtain an EDL from NEMA***

V. ***Comply with the provisions of the Environmental Management and Coordination (Water Quality) Regulations, 2006***

5.3.3.12 Solid waste generation

The facility will generate solid waste mostly in plastic sate, packaging materials, oil and grease containers, office waste and overburden among others. These have a potential of pollution if not disposed of appropriately. The proponent should therefore ensure proper management of solid waste during the operation of the plastic recycling and manufacture of plastic battery casing through the following measures as per Sustainable Waste Management Act of 2022.

Recommended mitigation measures

I. ***Sensitize new employees on solid waste management and its importance,***

II. ***Use the receptacles procured during the construction phase of the project cycle,***

III. ***Utilize the central collection bins procured during the construction phase,***
IV. ***Renew the contractual agreements with the solid waste contractor procured at the construction phase,***
V. ***Comply with the provisions of the Environmental Management and Coordination (Waste Management) Regulations, 2006,***
VI. ***Comply with Sustainable Waste Management Act 2022.***

5.3.3.13 Fuel, oil and grease spills and leakages

Waste oil at the facility will mainly be generated from the servicing and maintenance of vehicles and machinery. Other potential sources of waste oil spillages include leaks from machinery and vehicles during operations if not well maintained and poor onsite storage of oil and grease. Oil spillages can cause potential contamination of the environment and potentially ground water pollution and runoff contamination during rainy seasons.

Recommended mitigation measures

I. ***Pave the maintenance area to prevent possible soil and ground water contamination,***
II. ***Install drain systems with an oil interceptor around the maintenance area to prevent contamination of runoff,***
III. ***Shelter all oily materials from rain to prevent oil washout and possible runoff contamination,***
IV. ***Ensure the company's waste oil is handled by a waste handler duly registered by NEMA and holds a valid license,***
V. ***Put in place an emergency response plan to handle accidental spills and leakages.***

5.3.3.14 Energy demand

The operations of the plastic recycling and manufacture of plastic battery casing will increase the demand on energy for running the machinery and equipment and for lighting and powering of electrical appliances. Energy supply for development will be obtained from the national grid and supplemented by solar power plant to be installed at the proposed site.

Recommended mitigation measures

I. ***Display energy saving conservation tips,***
II. ***Maintain machinery and equipment in a serviceable and good working order to maximize its efficiency on fuel consumption,***

III. ***Harness solar energy for lighting purposes,***

IV. ***Conduct energy audits once every three years and implement the corrective measures.***

5.3.3.15 Impact of heavy trucks on roads

Once the plastic recycling and manufacture of plastic battery casing begin operations, there will be heavy commercial vehicles ferrying materials to different areas. Overloaded trucks may cause damage on the roads. To mitigate this impact the proponent and truck drivers will adhere to the axle load limits set by the Kenya Roads Board.

5.3.4 Negative impacts at possible decommissioning phase of the proposed project

The lifespan of the quarry is dependent on the quantities of the rock deposit, technology used to mine and financial sustainability of the business. In the event of end of project life/lifespan of the quarry, closure by government agencies due to non-compliance with environmental and health regulations, an order by a court of law due to non-compliance with existing regulations, natural calamities and change of user of land, the proponent should prepare and submit a due diligence decommissioning audit report to NEMA for approval at least three (3) months in advance.

The following environmental and social concerns will manifest at this phase;

I. Economic decline
II. Creation of an ecologically vulnerable land
III. Safety and health risks
IV. Waste generation
V. Insecurity

5.3.4.1 Economic decline

Employment opportunities and the County and National economic gain from the investment activity will be lost in the event of decommissioning of the proposed project.

Recommended mitigation measures

I. ***Train employees on alternative livelihoods prior to decommissioning***
II. ***Prepare and issue recommendation letters to employees to seek alternative employment opportunities***
III. ***Review potential job opportunities in other ongoing contracts by the proponent and recommend the employees who qualify***

IV. ***Comply with labor laws by paying the employees their terminal dues***

5.3.4.2 Creation of an ecologically vulnerable land

At this phase, destruction of various fauna and flora at the site is evident. It will also tamper with the soil structure exposing the site to possible landslides and soil erosion. Additionally, the terrain of the site would be against the topography of the area.

Recommended mitigation measures

I. ***Promote re-vegetation through the encouragement of the natural process of secondary succession***

5.3.4.3 Safety and health risks

Demolition of auxiliary facilities and dismantling of the Recycling plant and case manufacture plant could pose safety and health risks to workers, neighbors and visitors to the site. These risks are likely to emanate from accidental falls and cuts, injuries from demolition and dismantling tools and machinery use as well as noise and air pollution. Additionally, possible dust emission and accidents during rehabilitation of the site could also pose a health and safety risks hazard to workers and general public.

Recommended mitigation measures

I. ***Obtain demolition permits from the County Government of Kajiado***
II. ***Contract a licensed construction company to carry out demolitions/ dismantling works***
III. ***Ensure the process of rehabilitation is supervised by competent personnel***
IV. ***Install signage to warn person(s) of the ongoing activities***
V. ***Provide adequate and appropriate PPE and enforce their use***
VI. ***Avail first aid kits on site***
VII. ***Give workers the correct hand tools and equipment for the jobs assigned***
VIII. ***Comply with the provisions of the Occupational Safety and Health Act, 2007***

5.3.4.4 Waste generation

Demolition, dismantling and rehabilitation activities will result in generation of both solid waste and effluent. The main sources of solid waste will include demolition waste from the auxiliary facilities and domestic waste from the workers. Effluent generated will also need to be disposed of appropriately.

Recommended mitigation measures

I. ***Recover the reusable and recyclable components of the plant and auxiliary facilities***

II. ***All recyclable materials should be collected and sent to NEMA licensed recyclers***

III. ***Sell off the plant machinery to other similar companies***

IV. ***Contract a NEMA licensed waste handler to handle and dispose both solid waste and effluent generated***

V. ***Comply with the provisions of the Environmental Management and Coordination (Waste Management) Regulations, 2006***

5.3.4.5 Insecurity

Insecurity will result from the site when it's abandoned succeeding the decommissioning. Unoccupied structures and uncovered pits within the site will act as criminal dens and the security boost that had been provided by the facility to the local community would be lost.

Recommended mitigation measure

I. ***Extend the tenure of contracted security firm during the operations of the facility***

5.4 Impact analysis

Potential project impacts are predicted and quantified to the extent possible. The magnitude of impacts on resources such as water and air or receptors such as people, communities, wildlife species and habitats is defined. Magnitude is a function of the following impact characteristics;

I. Type of impact (direct, indirect, induced)

II. Size, scale or intensity of impact

III. Nature of the change compared to baseline conditions (what is affected and how)

IV. Geographical extent and distribution (e.g. local, regional, international)

V. Duration and/or frequency (e.g. temporary, short-term, long term, permanent)

Magnitude describes the actual change that is predicted to occur in the resource or receptor. It considers all the various impact characteristics in order to determine whether an impact is negligible or significant. Some impacts can result in changes to the environment that may be immeasurable, undetectable or within the range of normal natural variation. Such changes can be regarded as essentially having no impact and are characterized as having a negligible magnitude (Table 5.1). The levels of impacts are defined using the following terms;

I. **Negligible impact (very low)** - Where a resource or receptor would not be affected by a particular activity or the predicted effect is deemed to be imperceptible or is indistinguishable from natural background variations.

II. **Less than significant impact (Low) -** Is a minor impact where a resource or receptor would experience a noticeable effect but the impact magnitude is sufficiently low (with or

without mitigation) and /or the resource or receptor is of low sensitivity. In either case, a less than significant impact must be sufficiently below applicable standard threshold limits.

III. **Potentially significant impact (moderate)** - A moderate impact that meets applicable standards but comes near the threshold limit. The emphasis for such moderate impacts is to demonstrate that the impact has been reduced to a level that is as minor as reasonably practicable so that the impact does not exceed standard threshold limits.

IV. **Significant impact (high) -** One where an applicable standard threshold limit would or could be exceeded or if a highly valued or very scarce resource would be substantially affected.

Table ; Risk and impact significance matrix for the proposed project.

Environmental Impact	Magnitude of impact		
	Construction phase	Operational phase	Decommissioning phase
Change in land use	3	0	0
Loss of arable land	2	0	0
Environmental risks of obtaining raw materials	2	0	0
Impact on the biodiversity	2	1	1
Soil erosion and sedimentation	2	2	2
Land degradation	2	1	0
Generation and disposal of excavated material	1	0	0
Effects on landscape	1	0	0
Visual intrusions	1	2	0
Occupational safety and health risks	1	1	1
Air pollution	2	1	1
Noise and excessive vibration pollution	2	1	1
Fire risks and emergency preparedness	0	1	1
Thermal pollution	0	1	1
Ground water pollution	0	1	0
Water demand	2	2	2
Effluent generation	0	2	2
Solid waste generation	2	2	2
Fuel, oil and grease spills and leakages	1	1	1
Energy demand	2	3	2

Impact of heavy trucks on roads	1	2	1
Creation of an ecologically vulnerable land	0	2	2
Insecurity	0	0	2

Legend

Magnitude	Impact score
Negligible	0
Low	1
Moderate	2
High	3

CHAPTER SIX
6.0 PUBLIC CONSULTATION AND TARTICIPATION

6.1 Legal basis

Stakeholder Consultation and Public Participation (CPP) component of the proposed Environmental and Social Impact Assessment (ESIA) study was conducted pursuant to the sustainability principles that emphasize application of participatory approaches to development, and stipulated in Part III, Section 17 of the Kenyan Environmental Impact Assessment and Audit Regulations, 2003 [2009] [2019] of the EMCA, 1999 [2015]. This legislative framework stipulates that the views and opinions of the local populace and relevant stakeholders in the proposed project be duly solicited, analyzed and accordingly integrated in the decision making about actions on the proposed project. In this context, the CPP process mapped out most of diverse views across community representation scales.

6.2 Data Collection Methods

6.2.1 Dimensions of views and opinions required

This ESIA study report sorted out views and opinions for purposes of determining fundamental environmental and social impacts that need to be mitigated in the entire life cycle of the proposed project. The focus was on how the plastic recycling and operation process and outcome, from the perspective of sustainable development thinking, is likely to induce changes in the existing natural and entire social and economic ecosystem elements.

This involved enlisting the public concerns (in their own self-expressions) in relation to how the planned project might conform to, and/or part ways with, the quality of their bio-spherical, socio-economic and cultural quality of lives. On the basis of analysis of these aspects, preferred impact mitigation measures for the proposed project were identified and proposed.

With this understanding, the CPP exercise in the ESIA study has availed extensive and inclusive views and opinions of the public and relevant stakeholders for decision making and subsequent actions on the proposed project.

The CPP exercise was organized around three mutually related perspectives:

I. Unravelling the indicative social and environmental issues for the proposed project,
II. Highlighting public concerns which may not be directly related to the proposed project but present significant bearings on its set up and subsequent operations in the absence of responsive mitigation measures; and

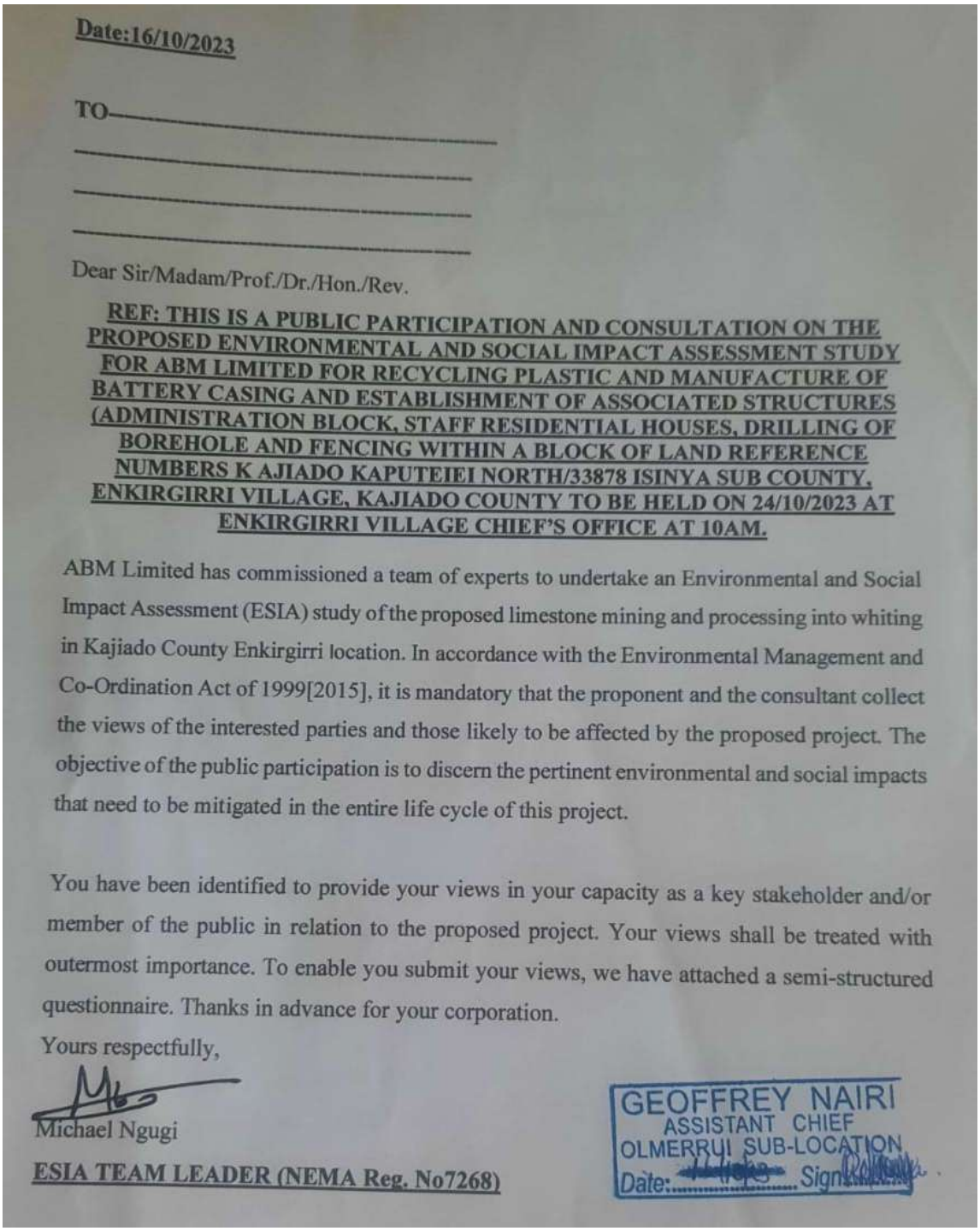
III. Analyzing and singling out core social and environmental concerns for consideration in formulating the environmental management plan (EMP) for the proposed project.

6.2.2 Target participants

The CPP process reached out to a wide range of participants in the interest of bringing in diverse views, knowledge and experiences to the shaping of social and environmental impact mitigation measures for the proposed project. To this end, target sources of data and information for the proposed ESIA study are:

I. Resident local community members through Public Barazas and media advertisement
II. Local opinion leaders (including religious leaders & political wings).
III. Heads of neighboring related auxiliary institutions and/or amenities/facilities. Special interest groups (CSOs/NGOs) and environmental movement actor organizations.
IV. Expert opinions of professionals and state/county government and environmental sustainability promotion agencies based in the surrounding proposed site for the project.

v. below finds sample photo of invites for public meetings.



Date:16/10/2023

TO_____

_____

_____

_____

Dear Sir/Madam/Prof./Dr./Hon./Rev.

REF: THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY TO BE HELD ON 24/10/2023 AT ENKIRGIRRI VILLAGE CHIEF'S OFFICE AT 10AM.

ABM Limited has commissioned a team of experts to undertake an Environmental and Social Impact Assessment (ESIA) study of the proposed limestone mining and processing into whiting in Kajiado County Enkirgirri location. In accordance with the Environmental Management and Co-Ordination Act of 1999[2015], it is mandatory that the proponent and the consultant collect the views of the interested parties and those likely to be affected by the proposed project. The objective of the public participation is to discern the pertinent environmental and social impacts that need to be mitigated in the entire life cycle of this project.

You have been identified to provide your views in your capacity as a key stakeholder and/or member of the public in relation to the proposed project. Your views shall be treated with outermost importance. To enable you submit your views, we have attached a semi-structured questionnaire. Thanks in advance for your corporation.

Yours respectfully,

Michael Ngugi

ESIA TEAM LEADER (NEMA Reg. No7268)

GEOFFREY NAIRI
ASSISTANT CHIEF
OLMERRUI SUB-LOCATION
Date:..... Sign.....

Source; Photo of the invitation letter given to the Assistant Chief

6.2.3 The CPP methods and supportive tools

The CPP was accomplished through a series of data collection methods and tools in the social science research traditions, namely:

I. Focus Group Discussions (FGDs)/meetings with local community members, aided by an FGD Schedule.
II. Key Informant Interviews (KIIs) with representatives of specialized state agencies and non-state actors in environmental sustainability management aided with an Interview Schedule.
III. Semi-structured questionnaire aided in-depth interviews (face-to-face guided interrogations with local opinion leaders).

6.2.4 Views collection, analysis and use

A combination of mobilization strategies was employed for various participant categories. The mobilization process for participants in the FGDs involved use of announcement and door to door by local administration (headman, Mzee wa Mtaa) within 3KM periphery of the proposed site for the project. This was blended with the support of local administration chiefs, assistant chiefs and local area leaders. For the KIIs and In-depth interviews, official booking request letters was written and delivered to the respective target participants 14 days prior to the date of the event, followed by phone calls.

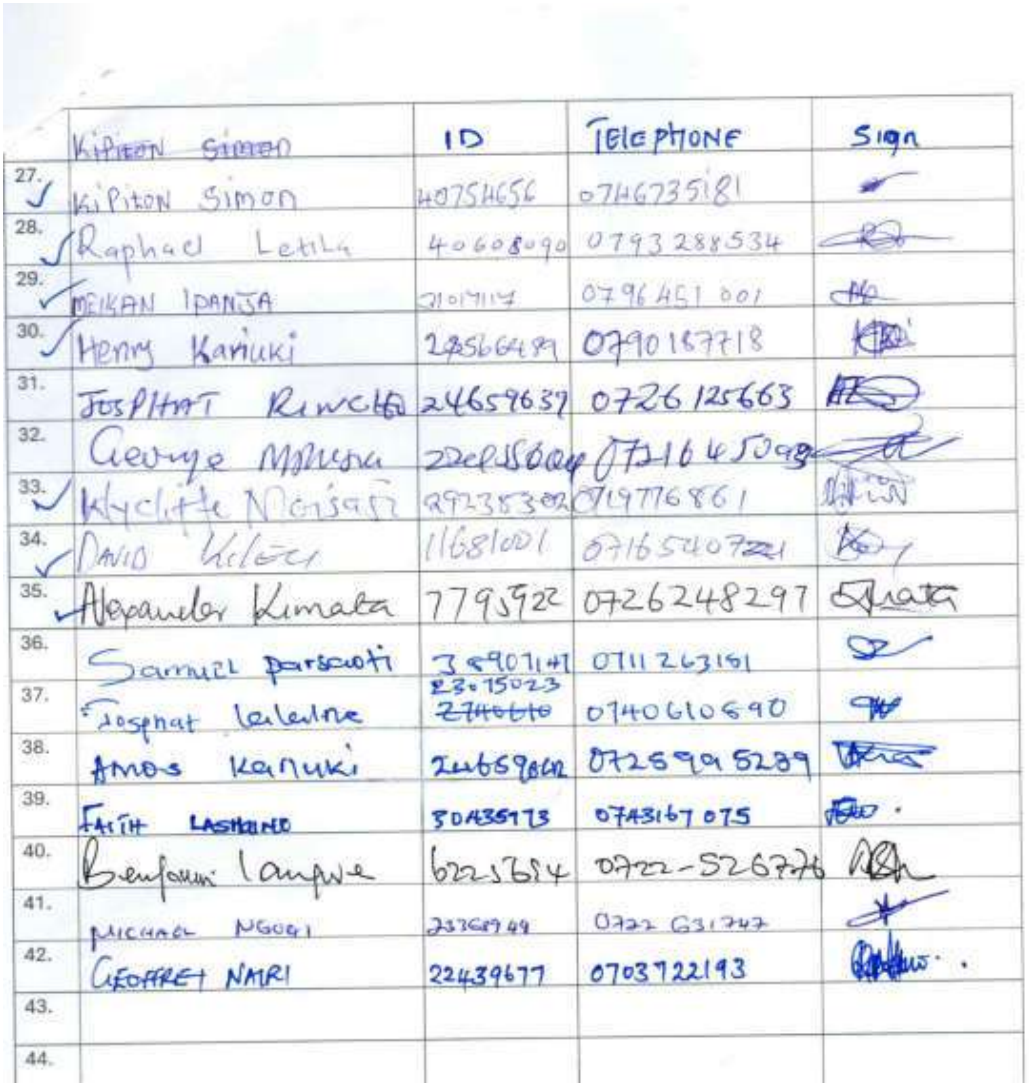
6.2.5 Collection of the stakeholder views

During the consultative meetings, the ESIA Study Team and the proponent representative provided participants with the project briefing Note that introduced them about the project and aiding them in grasping essential details relating to its intended objectives. This was expected to set the participants on the pathway to constructively ventilate their views and opinions for decision making purposes. This action involved treating the participants to the background about proposed project and explaining the design, its ultimate use and potential benefits to the local community. Also, possible social and/or cultural, economic, environmental and health challenges associated with the project activities and measures towards reducing the magnitude of their effects was pointed out.

After this introductory session, they (participants) were granted opportunity to freely air their views and opinions regarding the proposed project in the form of questions, comments and suggestions for input to and/or improvement. In the process, the ESIA Study Team took Field Notes and also the local administration took the minutes of the proceedings. As shown below list of participants and minutes attached to this report Annex……..

ATTENDANCE LIST FOR ABM PUBLIC PARTICIPATION FORUM
DATE 24TH OCTOBER 2023

NO.	NAME	ID NO.	TELEPHONE NO.	SIGNATURE
1. ✓	THOMAS PARSUAI	22151658	0705513341	
2. ✓	Benjamin Kariuki	31644191	0729754855	
3. ✓	Daniel Kitoipei	33031147	0769722129	
4. ✓	Kevin Maisagi	35527535	0742564877	
5. ✓	Max Mpuriah	23028056	0721.588057	
6. ✓	WILSON SIMINTEI	11680996	0720889932	
7. ✓	BENJAMIN LANTEI	22279853	0721542603	
8. ✓	DAVID KARIUKI	5364736	0728-507882	
9. ✓	JOSEPH SOOMPEI	20180471	0727257180	
10. ✓	AMOS LANTEI	0791670	0720881616	
11. ✓	Thomas KASIO	22439792	0720071426	
12. ✓	Erick Maisagi	31807895	0706318020	
13. ✓	Nancy Simintei	32204573	0746035422	
14. ✓	Joseph Parsuai	29735581	0727503696	
15. ✓	Jeremiah Satiere	29224079	0797881797	
16.	DANIEL MEERA	20873165	0726961523	
17. ✓	Justine Nalomoa	29162897	0725498367	
18. ✓	Susan Simintei		0786615386	
19. ✓	Charity Parmutia	24981753	0792564296	
20. ✓	Catherine Ntaiettio	27709819	0745838156	
21. ✓	Evalyne Parmanyaa	0790457109	0790457113	
22. ✓	Evalyne Koipiaa	31058361 0726627075	0718609076	
23. ✓	Sarah Opel	34060743	0706160967	
24. ✓	Charity Kiparki	25637355	0113544467	
25. ✓	ERIC SANDEOLE KUYA	11261399	0714672757	



		ID	TELEPHONE	Sign
27.	KIPITON SIMON	40754656	0746735181	
28.	Raphael Letila	40608090	0793288534	
29.	MEIKAN IPANJA	21019114	0796451001	
30.	Henry Kamuki	28566489	0790187718	
31.	JOSPHAT Rimeto	24659637	0726125663	
32.	George Mpuka	22[illegible]	0716450[illegible]	
33.	Hyclitte Moisa	29238302	0197768[illegible]	
34.	DAVID [illegible]	11681001	0716540721	
35.	Alexander Kimaka	7795922	0726248297	
36.	Samuel parsoti	38907147	0711263191	
37.	Josphat Lelelive	23075023 27[illegible]	0740610690	
38.	AMOS KAMUKI	24659[illegible]	0725995289	
39.	FAITH LASHANO	30435973	0743167075	
40.	Benjamin Lanpwa	6225614	0722-526776	
41.	MICHAEL NGOGI	23369749	0722 631747	
42.	GEOFFREY NARI	22439677	0703722193	
43.				
44.				

Source; Scanned attendance form attached to this ESIA report

The discussions were guided by the ESIA Study Team, within the framework of questions and directions for responses outlined in the assessment tools.

The resultant statements contained in the Field Notes were, thereafter, examined for common patterns in the expressed views and opinions on social and environmental risk factors and potential mitigation measures for the proposed project. At the end of each CPP session, the EIA Team informed respective participants that a further platform for airing their views is set to be presented to them when the National Environment Management Authority (NEMA) analyses the ESIA Report, and finally publishes invitations for public comments from the newspaper adverts, radio adverts and Kenya Gazette.

6.2.6 Community and stakeholder consultative meetings

6.2.6.1 Community consultative meeting

The community consultative meeting was held on 24th October 2023 at the Assistant Chief office Enkirgirri village, Olmerrui Sub location, Isinya Location, Kajiado County. Table below shows some of the summarizes the impacts identified by the local community and their recommended mitigation measures.

Table: Impacts identified by the local community and their recommended mitigation measures.

IMPACT IDENTIFIED BY THE LOCAL COMMUNITY	RECOMMENDED MITIGATION MEASURES PROPOSED BY THE COMMUNITY
Air pollution	• Implement measures to prevent air pollution
Wastewater generation and management	• Implement measures to prevent wastewater generation and management
Employment opportunities to the locals	• Prioritizing employment opportunities to the locals • Capacity building by offering training to the locals • Women to be given priority
Corporate Social Responsibility (CSR)	• Initiate CSR projects such as construction of a road and equipping • learning facilities


ASSITANT CHIEFS OFFICE


ASSITANT CHIEFS OFFI

Photos; Community members during the consultative meeting at the assistance chief's office on 24th October 2023 (Source: Community consultative meeting, 24th October 2023).

6.2.7 Grievances Redress Mechanism

6.2.7.1 Introduction

The affected persons by the proposed project may raise their grievances and dissatisfaction about actual or perceived impacts in order to find a satisfactory solution. These grievances, influenced by their physical, situational and/or social losses, can emerge at the different stages of the project cycle. Not only should the affected persons be able to raise their grievances and be given an adequate hearing, but also satisfactory solutions should be found that mutually benefit both the affected persons and the project. It is equally important that the affected persons have access to legitimate, reliable, transparent and efficient institutional mechanisms that are responsive to their complaints.

6.2.7.2 Grievances prevention

Grievances cannot be avoided entirely, but much can be done to reduce them to manageable numbers and reduce their impacts. This will be achieved by;

1. Providing sufficient and timely information to communities. Many grievances arise because of misunderstandings; lack of information; or delayed, inconsistent or insufficient information. Accurate and adequate information about a project and its activities, plus an approximate implementation schedule, should be communicated to the communities, especially affected parties, regularly.
2. Conduct meaningful community consultations. The project proponent should continue the process of consultation and dialogue throughout the implementation of the project. Sharing information, reporting on project progress, providing community members with an opportunity to express their concerns, clarifying and responding to their issues, eliciting communities' views, and receiving feedback on interventions will benefit the communities and the project management.
3. Overall good management of the facility will ensure a reduction in potential conflicts with the local community and other stakeholders.

6.2.8 Grievances Redress Mechanism Tool

The recycling plant will have a more prompt and efficient resolution on individual and collective complaint and provision of feedback on any grievances and dissatisfaction from stakeholders during operations. The flow chart below (Figure) shows a complaint and proposal consideration mechanism for the plant that provides an accessible channel for submission of complaints and feedback to stakeholders.

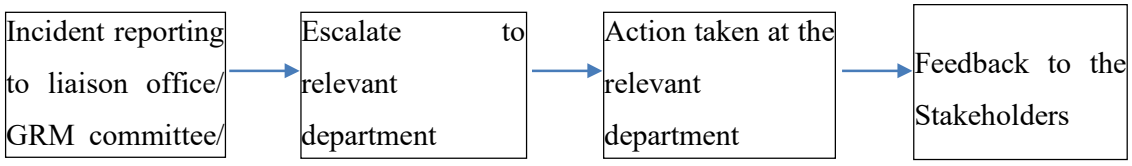


Figure: Grievances Redress Mechanism Tool flow chart (Source: Consultant's gallery, 2023).

CHAPTER SEVEN

7.0 MONITORING PLAN AND ALTERNATIVES TO DEVELOPMENT

7.1 Monitoring plan

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment in any industrial process. With the knowledge of baseline conditions, the monitoring programme will serve as an indicator for any deterioration in environmental conditions due to operation of the proposed Plastic Recycling facility to enable taking up suitable mitigation steps in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. The following routine monitoring programme would therefore be implemented in the entire project cycle.

7.1.1 Training Programmes

Training and re training will be very important for ABM Limited workers particularly those who will be in direct operations. They shall be trained in the following areas:

I. Occupational health and Safety training
II. Firefighting training
III. Hazardous and non-hazardous waste management training
IV. Energy efficiency
V. Regular refresher training on relevant process technologies
VI. Environmental management training like internal environmental audit training

7.1.2 Emergency preparedness

Emergency preparedness will be put in place during the entire project cycle. In the event of accidents or any other emergency, it will be possible to manage any situation. Firefighting infrastructure will be installed and continually upgraded. Regular medical extermination will be carried out for workers

7.1.3 Air and water quality

The proponent will continually monitor the air and water quality at the site by regularly sampling for analysis in licensed laboratories.

7.2 Project Alternative for Development

Analyzing project alternatives is important as it allows the proponent to evaluate possible project options that could mitigate the environmental risks identified during the ESIA process through prevention, elimination of the risks all together or reduction of the severity of an impact. The analysis will also assist NEMA and lead agencies in decision making by either approving the project as proposed or advising the proponent on the need for a particular alternative such as an alternative site or technological and design changes. In the current proposal, the alternatives identified are discussed in detail below.

7.2.1 The 'No Project' alternative

The 'No Project' alternative has the advantage of retaining the status quo, meaning that the predicted environmental and social impacts will not occur and is ideally the best case scenario for mitigation. The status quo however denies the proponent and the government at large a chance to contribute towards the realization of the Kenya Vision 2030-Economic and Macro Pillar, the proponent and potential workers a source of income, the government a source of revenue and the market a supply of plastic casing. The 'No project' alternative is therefore not considered viable in the light of the benefits and deprivations of the project.

7.2.2 The "proposed Project" alternative

Even though there exist other sites with for the establishment of the proposed project, land availability, and proximity to favorable infrastructures (raw materials, roads, water, reliable, energy) formed the basis of selection of the proposed site. Moreover, the proposed site was considered the most feasible because of the following advantages.

Advantages of this alternative

I. The location in which the project is to be established in Kajiado county is bit far from human settlement and therefore ideal for the proposed project.
II. The site is easily accessed.
III. The site is easily accessible to electricity
IV. The proposed project has received change of user approval from the County Government of Kajiado and the ministry of lands.
V. Locating the project on the proposed site will be beneficial to the local community in the area.

The selection of the site for the proposed project however has the following disadvantages;

I. The proposed project will increase industrial development footprint and its attendant effects on the bio-physical environment of the immediate area.
II. The local resources and public utilities in the location of the site will be strained due to additional development.

Under the project alternative, the proponent will be issued with an ESIA License. In issuing the license, NEMA will approve the proponent's proposed project provided that all environmental measures are complied with at all phases. This alternative consists of the applicant's final proposal with the inclusion of the NEMA regulations and procedures as stipulated in the environmental management and coordination (Act 2015). **This is the most viable option in respect to the facility.**

7.2.3 Alternative project site

An alternative site could be considered if the proposed project would present serious environmental challenges that cannot be effectively managed. However, the proposed mitigation measures are considered adequate to minimize the impacts to levels that do not warrant significant environmental damage. This alternative is therefore not viable.

7.2.4 Alternative project

An alternative project such as a residential development, cottages, farm or a ranch could be possible in the event an industrial development is not feasible. Within the proposed area in Isinya sub county, there is availability of adequate land and therefore this project is deemed economically viable compared to other project alternatives. Additionally, it suits the business needs of the proponent. Thus, an alternative project is not viable.

CHAPTER EIGHT

8.0 SUMMARY OF ANTICIPATED IMPACTS AND THEIR MITIGATION MEASURES.

Table 8.1: Environmental and Social Management Plan for the site preparation, and construction phase of the proposed project auxiliary amenities

ENVIRONMENTAL CONCERNS	RECOMMENDED MITIGATION MEASURES
Change in land use	Obtained change of user from the County Government of Kajiado (see attached document annex …….)
Environmental risks of obtaining raw materials	Source raw materials from sites that are licensed by NEMA
	Have a procurement plan based on the Bill of Quantities
	Sensitize personnel on wastage of construction materials.
Impact on the biodiversity	Rehabilitate the excavated areas paved for construction phase
	Retain vegetation cover in areas that will not be excavated as far as practicable
Soil erosion and sedimentation	Construct a water pan or a dam
Occupational safety and health risks	Register the site as a workplace with DOSHS
	Obtain insurance cover for the workers at the site
	Provide adequate and appropriate PPE and enforce their use for both workers and visitors

	Provide employees with correct tools and equipment for the jobs assigned and train on their use
	Ensure moving parts of machines and sharp surfaces are securely protected with guards to avoid unnecessary contacts and injuries
	Provide first aid services and an emergency vehicle at the site
	Regulate the entry of visitors to the construction site by deploying adequate security measures
	Comply with the provisions of the Air Quality Regulations 2014 and Noise and Excessive Vibration Pollution (Control) Regulations, 2009
	Comply with the provisions of the OSHA, 2007
Noise pollution	Delivery of raw materials, excavation and construction work will be limited to day time hours (8am to 5pm)
	Locate machinery that are likely to produce noise as far as practical from neighboring properties
	Provide and enforce the use of earmuffs to workers and visitors
	Sensitize truck drivers to avoid unnecessary hooting and running of vehicle engines
	Comply with the Noise and Excessive Vibration Pollution (Control) Regulations, 2009
Air pollution	Install dust screens around the project site
	Sprinkle water at the excavation areas to suppress dust
	Use low sulphur fuels to power vehicles and site machinery

	Use of serviceable machinery/equipment and trucks
	Procure and enforce the use of dust masks to workers and visitors to the project site
	Comply with the provisions of the Air Quality Regulations, 2014
Water demand and effluent generation	Sensitize the workers on the need to conserve available water resources
	Procure and deliver to the site one mobile toilets from a NEMA licensed waste contractor for use by the workers
	Comply with the provisions of the Water Quality Regulations, 2006
Solid waste generation	Procure and strategically place adequate solid waste collection bins with a capacity for segregation
	Procure a sizeable central solid waste collection bin with chambers to accommodate separated waste
	Create awareness on best waste management practices among the workers
	Procure the services of a NEMA licensed waste handler to dispose of the solid waste
	Comply with the provisions of the Waste Management Regulations, 2006
Fuel, oil and grease spills and leakages	Prevent oil/grease spillages by employing skilled mechanics
	Procure and train workers on the use of oil spill containment kits
	Contract a NEMA licensed waste oil handler to manage the waste oil from the construction site

Table 8.2: Environmental and Social Management Plan for the operational phase of the proposed project.

ENVIRONMENTAL CONCERNS	RECOMMENDED MITIGATION MEASURES
Land degradation	Plant trees on land that is not constructed
	Construct water pan or dam for collection of storm water and roof catchment water
Effect on landscape and visual intrusions	Take into consideration the existing land forms and vegetative cover in siting before excavation
	Locate the plant, stockpiles, and other waste material away from sensitive landscape & visual receptors
	Re-vegetate the unused land
Impact on biodiversity	Retain vegetation cover where possible within the site and plant more trees
	Plant appropriate indigenous trees or approved exotic ones
Occupational safety and health risks	Register the site as a workplace with the DOSHS
	Provide and enforce appropriate PPE among workers and visitors to the site
	Provide a fully equipped first aid box, first aid services and emergency vehicle at the site
	Provide adequate training to staff on health and safety
	Provide the correct equipment to employees for the jobs assigned and trained on their use

	Designate a fire assembly point within the facility
	Deploying adequate security measures and fencing where appropriate
	Comply with the provisions of the OSHA, 2007
Air pollution	Install dust arresters and air control equipment
	Retain existing vegetation in areas which is not for construction and plant more trees
	Sprinkling water on the drive road on a daily basis as often as necessary
	Provide adequate dust masks to workers and enforce on their use
	Restrict the speed of vehicles to 20KPH and place a signage at the main gate
	Monitor fugitive emissions
	Comply with the provisions of the Air Quality Regulations, 2014
	Comply with the provisions of the OSHA, 2007
Noise and excessive vibration pollution	Install Noise arresters within the factory
	Provide and enforce the use of earmuffs to all workers and visitors
	Ensure that the vibration levels of machines do not exceed 0.5 cm/s beyond the source property boundary
	Conduct noise mapping to inform mitigation measures

	Comply with the provisions of the Noise and Excessive Vibration Pollution (Control) Regulations, 2009
Fire risks and emergency preparedness	Formulate a fire and emergency response action plan and communicate it to the staff
	Provide suitable and adequate fire-fighting equipment at appropriate locations within the development
	Service fire-fighting equipment
	Provide fire exits within the factory
	Designate a fire assembly point within the facility
	Conduct fire drills
	Train workers on fire safety
	Conduct inspection of electrical installations and maintain records of such inspections
	Comply with the provisions of the Occupational Safety and Health Act, 2007
Thermal pollution	Use cooling towers before releasing heat to the environment
	Reduce the amount of working hours for the employees operating around the kilns and its environs
	Provide and enforce the use of PPE
	Shield surfaces where workers 'proximity and close contact with hot equipment is expected
	Implement specific personal protection safety procedures to avoid potential exposure to exothermic reactions

	In case of any contamination, pumped water should be treated
Water demand and effluent generation	Sensitize the staff on the need to conserve the available water
	Install a bio-digester for proper treatment of the effluent
	Contract a NEMA licensed laboratory to undertake quarterly monitoring of the quality of effluent
	Apply for and obtain an EDL from NEMA
	Comply with the provisions of the Water Quality Regulations, 2006
Solid waste generation	Sensitize employees on solid waste management and its importance
	Use the receptacles procured during the construction phase of the project cycle
	Utilize the central collection bins procured during the construction phase of the project cycle
	Renew the contractual agreements with the solid waste contractor procured at the construction phase
	Comply with the provisions of the Sustainable Waste Management Act of 2022 and the Waste Management Regulations, 2006
Fuel, oil and grease spills and leakages	Pave the maintenance area to prevent possible soil and ground water contamination
	Install drain systems with an oil interceptor around the maintenance area to prevent contamination of runoff
	Shelter all oily materials from rain to prevent oil washout and possible runoff contamination

	Ensure the company's waste oil is handled by a waste handler duly registered by NEMA and holds a valid license
	Put in place an emergency response plan to handle accidental spills and leakages
Energy demand	Display energy saving conservation tips
	Maintain machinery and equipment in a serviceable and good working
	Harness solar energy for lighting purposes and other operations
	Conduct energy audits and implement the corrective measures
Impact of heavy trucks on roads	Adhere to the axle load limits set by the Kenya Roads Board

Table 8.3: Environmental and Social Management Plan for the decommissioning phase of the proposed project.

ENVIRONMENTAL CONCERNS	RECOMMENDED MITIGATION MEASURES
Economic decline	Train employees on alternative livelihoods
	Prepare and issue recommendation letters to employees to seek alternative employment opportunities
	Review potential job opportunities in other ongoing contracts by the proponent and recommend the employees who qualify
	Comply with labor laws by paying the employees their terminal dues
Creation of an ecologically vulnerable land	Plant exotic and indigenous trees
	Water pan to be converted to animal watering points
	Promote re-vegetation through the encouragement of the natural process of secondary succession
Safety and health risks	Obtain demolition permits from the County Government of Kajiado
	Contract a licensed construction company to carry out demolitions/ dismantling works
	Ensure the process of rehabilitation is supervised by competent personnel
	Install signage to warn person(s) of the ongoing activities
	Provide adequate and appropriate PPE and enforce their use

	Avail first aid kits on site
	Give workers the correct hand tools and equipment for the jobs assigned
	Comply with the provisions of the OSHA, 2007
Waste generation	Recover the reusable and recyclable components of the plant and auxiliary facilities
	All recyclable materials should be collected and sent to NEMA licensed recyclers
	Sell off the plant machinery to other similar companies
	Contract a NEMA licensed waste handler to handle and dispose both solid waste and effluent generated
	Comply with the provisions of Sustainable Waste Management Act, of 2022 and the Waste Management Regulations, 2006
Insecurity	Extend the tenure of contracted security firm during the operations of the facility

CHAPTER NINE
9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

The proposed project will ensure industrialization and development through the utilization of the country's plastic recycling to catalyze diversified industrial development coherent with Kenya's Vision 2030. It is in line with the Kajiado County Integrated Development Plan whose overall aim is to increase and expand sustainable development opportunities and build people's capacities to enable them create wealth and transform their lives for growth and prosperity. In addition, the proposed project will earn the country foreign exchange and meet the national and regional demand for processed mineral resources, contribute towards the socioeconomic growth of the area through employment creation and revenue generation to the county and national governments in terms of taxes generated during the acquisition of statutory licenses. The key concerns that will result from the implementation of the proposed project include air and noise pollution, water demand and effluent generation, solid waste generation and management, occupational safety and health risks, fire risks and emergency preparedness, exposure to thermal heat and increased energy demand. The ESIA study proposes a suite of comprehensive Environmental and Social Management and Monitoring Plans to address the anticipated negative impacts during the entire project cycle and improve the environmental performance of the proposed project.

9.2 Recommendations

The main recommendation of the ESIA is the need for concerted implementation of the Environmental Management and Monitoring Plans by the proponent. The specific key ones include;

1. Register the site as a workplace with the Directorate of Occupational Safety and Health Services (DOSHS).
2. Provide adequate and appropriate Personal Protective Equipment (PPE) to workers and visitors to the site and enforce on their use.
3. Procure the services of a NEMA licensed waste handler to dispose off the solid waste.
4. Conduct occupational safety and health audits and implement measures to reduce the risk posed to those working in the recycling plant.
5. Undertake noise level monitoring in collaboration with a NEMA designated laboratory.
6. Conduct annual fire safety audit and fire drills.

7. Comply with the provisions of the Environmental Management and Coordination (Water Quality) Regulations, 2006.
8. Comply with the provisions of the Environmental Management and Coordination (Waste Management) Regulations, 2006.
9. Comply with the provisions of the Environmental Management and Coordination (Air Quality) Regulations, 2014.
10. Comply with the provisions of the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.
11. Comply with the provisions of the Occupational Safety and Health Act, 2007.
12. Comply with the set National Government and County Government Directives and guidelines on prevention of the spread of COVID-19.

On the basis of a commitment by the proponent to implement the proposed mitigation measures and the Environmental Management Plan, we recommend the issuance of an EIA License as per the Environmental Management and Coordination Act Cap. 387 of the Laws of Kenya and Environmental Management and Coordination (Impact Assessment and Audit) Regulations, 2003.

10.0 REFERENCES

1. County Government of Kajiado, (2018). Kajiado County Integrated Development Plan, 2018-2022.
2. Government of Kenya (2019). 2019 Kenya Population and Housing Census, Kenya National Bureau of statistics.
3. Government of Kenya Policies
    - Kenya Vision, 2030
    - Mining and Minerals Policy, 2016
    - National Environment Policy, 2013
    - National Health Policy, 2014 – 2030
    - National Land Policy, 2009
    - National Water Services Strategy, 2004
4. Republic of Kenya Statutes:
    - Environmental Management and Coordination (Air Quality) Regulations, 2014
    - Environmental Management and Coordination (Impact Assessment and Audit) Regulations, 2003
    - Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulation, 2009
    - Environmental Management and Coordination (Waste Management) Regulations, 2006
    - Environmental Management and Coordination (Water Quality) Regulations, 2006
    - Environmental Management and Coordination Act Cap 387 of the Laws of Kenya
    - Environmental Management and Coordination Act No. 8 of 1999 (Rev. 2015)
    - Sustainable Waste Management Act of 2022
    - The Constitution of Kenya, 2010
    - The County Government Act, 2012
    - The Energy Act, 2019
    - The Occupational Safety and Health Act, 2007
    - National Construction Authority Act, 2014
    - The Physical and Land Use Planning Act, 2019
    - The Public Health Act, 2012
    - The Water Act, 2016

11.0 LIST OF ANNEXTURES

1. Copy of the Title deed for the proposed project site
2. Copy of the layout of the plant and process flowchart
3. Copy of approval of the scoping report and Terms of Reference for the ESIA study
4. Copies of the baseline monitoring reports for air quality, noise level measurements and soil tests
5. Letter of invitation and evidence of receipt by the Area Chief inviting the community members for the consultative meeting
6. Copy of the community consultative meeting programme
7. Minutes of all the meetings and community consultative meeting held at assistance chief's office on 24th October 2023.
8. Copies of the public consultation questionnaires
9. Copies of NEMA practicing licenses for Lead Experts, Mr. Michael Ngugi & Mr. Jacob Akinala.

No. 5534.

CERTIFICATE OF INCORPORATION

I hereby Certify, that—

ASSOCIATED BATTERY MANUFACTURERS (EAST AFRICA) LIMITED.------

is this day Incorporated under the Companies Ordinance, 1959, and that the Company is LIMITED.

Given under my hand at Nairobi this ELEVENTH day of JUNE One Thousand Nine Hundred and SIXTY THREE

Asst. *Registrar of Companies*

G.P.K. 2324—1m—8/62

KENYA REVENUE AUTHORITY

www.kra.go.ke

PIN Certificate

For General Tax Questions
Contact KRA Call Centre
Tel: +254 (020) 4999 999
Cell: +254(0711)099 999
Email: callcentre@kra.go.ke

Certificate Date : 24/06/2015

Personal Identification Number

P000595348D

This is to certify that taxpayer shown herein has been registered with Kenya Revenue Authority

Taxpayer Information

Taxpayer Name	Associated Battery Manufactures East Africa Limited
Email Address	accountspayables@abm.co.ke

Registered Address

L.R. Number :	**Building :** KAMPALA RAOD
Street/Road : KAMPALA ROAD	**City/Town :** NAIROBI
County : Nairobi	**District :** Nairobi East District
Tax Area : Nairobi East	**Station :** LTO*
P. O. Box : 48917	**Postal Code :** 00100

Tax Obligation(s) Registration Details

Sr. No.	Tax Obligation(s)	Effective From Date	Effective Till Date	Status
1	Income Tax - Company	21/04/2009	N.A.	Active
2	Value Added Tax (VAT)	01/01/1990	N.A.	Active
3	Income Tax - PAYE	14/02/2007	N.A.	Active

The above PIN must appear on all your tax invoices and correspondences with Kenya Revenue Authority. Your accounting end month is March unless a change has been approved by the Commissioner-Domestic Taxes Department. The status of Tax Obligation(s) with 'Dormant' status will automatically change to 'Active' on date mentioned in "Effective Till Date" or any transaction done during the period. This certificate shall remain in force till further updated.

* The station is subject to change based on the verification done by Commissoner.

Disclaimer : This is a system generated certificate and does not require signature.

REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Title Number KJD/KAPUTIEI NORTH/33878

Approximate Area 23.20 Ha.

Registry Map Sheet No. .....

This is to certify that ASSOCIATED BATTERY MANUFACTURERS (EAST AFRICA) LIMITED P.O. BOX 48917-00100 NAIROBI

=

=

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the

KAJIADO District Land Registry

this 3rd day of February 20 14

Land Registrar

P. M. Cheruiyot - 264

1

KAPUTIEI NORTH

33878

23.20

5	5.12.13	ASSOCIATED BATTERY MANUFACTURERS (EAST AFRICA) LIMITED	
6	3.2.14	TITLE DEED	ISSUED

PART C—ENCUMBRANCES SECTION

Entry No.	Date	Nature of Encumbrance	Further Particulars	Signature of Registrar

Malkiat
Land Registrar

REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

MLS/TD/02/A2/02 No 0684142

GPK (SP) 7071—100m—08/2013

COUNTY GOVERNMENT OF KAJIADO

Physical Planning Receipt

Issued To: ASSOCIATED BATTERY MANUFACTURERS (EAST AFRICA) LIMITED KJD/KAP-NORTH/33878

Phone Number 0722593888

Receipt no: 24342759
Date: 04-07-2023 12:06

#	Item Description	Amount
1	APPLICATION FORM	1500.00
2	CHANGE OF USER	1710000.00
	Total Amount	1711500.00

COUNTY GOVERNMENT OF KAJIADO
04 JUL 2023
RECEIVED
P.O. Box 11 KAJIADO

CUSTOMER COPY
Servee by: Emily Sakayiol
Paid on 2023-07-04 12:06

Powered By: jambopay Simple & Secure

COUNTY GOVERNMENT OF KAJIADO

Receipt

No.B 22179

Issued To: ASSOCIATED BATTERY MANUFACTURERS (EAST AFRICA) LIMITED KJD/KAP-NORTH/33878

Receipt no: 24342759
Date: 04-07-2023 12:06

COUNTY GOVERNMENT OF KAJIADO

Land Rates Receipt

Issued To: ASSOCIATED BATTERY MANUFACTURERS (EAST AFRICA) LIMITED KJD/KAP-NORTH/33878

Receipt no: 53957758

Date: 04-07-2023 12:20

Bill Number: PZ9H4J6R **Plot Number :** KJD/KAP-NORTH/33878

#	Item Description	Amount
1	Annual Rent	10000.00
2	Other Charge	0.00
3	Penalties	0.00
4	Interest	0.00
5	Arrears amount	80000.00
6	Total Paid amount	0.00
Total Amount		90000.00

COUNTY GOVERNMENT OF KAJIADO
0 JUL 2023
PAID
P.O. Box 11 - 01100, KAJIADO

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COUNTY GOVERNMENT OF KAJIADO

COUNTY PHYSICAL PLANNING DEPARTMENT
P.O. BOX 11-01100,
KAJIADO.

PHYSICAL AND LAND USE PLANNING ACT
(No. 13 of 2019)

FORM PLUPA/DC/8 **(r.8(3)(1))**

Registered No. Application C/104/2023

NOTIFICATION OF APPROVAL OF DEVELOPMENT PERMISSION

TO:
ASSOCIATED BATTERIES MANUFACTURES (EA) LTD.
P.O. BOX 48917-00100,
NAIROBI.

Your application numbered as above, submitted on **04/07/2023** for permission to change use from **agricultural to light industry** on parcel LR. No. **Kjd/kaputiei-North/33878** situated in **Isinya, off Isinya-konza road** has been **approved** on **07/07/2023** subject to the following conditions:

1. Land be used exclusively for solar panel and batteries production in accordance with standards set by energy production regulatory.
2. Plot coverage should not exceed seventy-five (75%) percent.
3. Building line of at least ten (10) metres on the plot frontage be maintained.
4. Compliance with the change of use requirements stipulated in the Land Regulations (Legal Notice No. 280 of 2017), Regulations No. 18 (6) before submissions of building plans for approval.
5. Building plans (Architectural and Structural) be approved by the County Government of Kajiado and other relevant Government agencies before commencing any construction works.
6. Undertake Environmental Impact Assessment before commencing works.
7. Payment of annual land rates as demanded by the County Government of Kajiado.
8. That the land does not constitute part of any public or disputed private land.
9. Any pollution be contained within the site.
10. Provide adequate and functional on-site parking.
11. The County Government of Kajiado may nullify the approval or alter the conditions for approval in case of non-compliance or as it may deem fit.
12. Access be restricted to avert potential conflicts.
13. Project implementation be undertaken by qualified registered professionals.
14. Sitting of the project be consistent with zoning regulation governing land use in the area.

COUNTY DIRECTOR OF PHYSICAL PLANNING
APPROVED
KAJIADO COUNTY

Dated: ...07 JUL 2023...

Signed: .....
County Director of Physical Planning

purchcon
BUILDING AND CIVIL ENGINEERING CONTRACTORS

P.O. Box 14227 - 00800 Nairobi
Tel: +254 721 425 699
info@purchcon.co.ke
purchconltd@gmail.com
www.purchcon.co.ke

BUILDING AND CIVIL WORKS TO LR No. 33878 IN ISINYA.

06 November 2023.

Dear Sir,

Please see below a quotation for the Building and Civil works for Isinya.

1. PLASTIC RECYCLING LINE
   6m height, 10m width, 18m length. Steel structure, with concrete floor.
   Kshs. 8,100,000.00.

2. OFFICE, CANTEEN, CHANGING ROOMS
   8m x 8m single storey structure with tiled floor and corrugated roofing sheets
   Kshs. 4,800,000.00

3. WATER STORAGE DAM
   100m x 50m Earth dam with lining
   Kshs. 5,500,000.00

4. BOUNDARY FENCING TO PLOT
   Concrete cranked posts with 2100mm chain-link fence to plot boundary
   Kshs.9,800,000.00

5. GRAVELLING AND SPOT IMPROVEMENTS TO EXISTING ROADS
   Kshs 3,000,000.00

6. SOLAR SYSTEM
   Kshs. 35,000,000.00

7. All Equipment to Plastic recycling to be supplied by Client.

Total Cost : Ksh 66,200,000/-

Yours Sincerely

Onkar Kalsi

purchcon
BUILDING AND CIVIL ENGINEERING CONTRACTORS
P. O. Box 14227-00800
Nairobi, Kenya

ZHANGJIAGANG RETECH MACHINERY CO.,LTD
E-MAIL:sales2@plasticrecycling-machine.com
E-Mob/Whatsapp/Wechat:+8618112685508

Offer No: RM20230826
To: Associated Battery Manufacturers {EA} LTD

RHDJ150150 PP Rigid Plastic Flakes Double Stage Water Ring Pelletizing Line

（Capacity:500kg/h）

1.Project information:

(1) Space: 18m*4m*4.5m(L*W*H)-" I "type
(2) Electric standard: according to customer's working location (**380v-60hz,Three Phase**)
(3) Water consumption: recycle using
(4) Electric power: Opening power is:185kw/h, actually running power is 130kw/h
(5) Labors: 1-2 workers
(6) Color: Main body use gray and yellow(customized)

2. Equipment List:

No.	Name	Quantity	Price USD
1	Screw Loader	1	
2	RHDJ150 Main Extruder	1	
3	RHDJ150 Sub-extruder	1	
4	Hydrualic screen exchanger	1	
5	Die face cutting system	1	

6	Water flume	**1**	
7	Dewatering machine	**1**	
8	Vibration Screen	**1**	
9	Blower conveying system	**1**	
10	Storage hopper	**1**	
11	Electric panel	**1**	
Final	**FOB Shanghai**		**64,800USD**

3.Specification:

1.Screw Loader

(1) Screw auto feeder
(2)Motor power: 1.5kw
(3)Material: stainless steel
(4)Pipe diameter: ø90mm

2.RHDJ150 Main extruder

1.Gearbox:280 high torque, low noise,hardened teeth grinding gear box with an external cooling circulatory

2.Screw and barrel: 38CrMoA1A,nitride treatment
Tempering hardness: HB230-250
Nitride hardness: HV850-950
The depth of nitride treatment: 0.5-0.7mm
Brittleness: 2 grades
3.L/D: 28:1
4.Diameter of screw: φ150mm
5.Motor power: 132kW(AC),frequency control
6.Speed of screw: 0~120rpm
7.Way of cooling: force wind cooling way
8.Heating way: by heaters(cast aluminium)
9.Heating zones:9zones(with mould)
10.Thermostat zone: 6 zones
11.Heating power: about 50KW
12.Vacuum degassors: one
13.Vaccum pump:3kw(water circle type)

3.RHDJ150 Sub- Extruder

1. Model Gear Box：high torque, low noise, Hardened teeth grinding gear box with an external cooling circulatory
2. Screw: 38CrMoA1A; nitride treatment
3. Barrel: 38CrMoA1A; nitride treatment
4. Screw Diameter:150mm
5. L/D：10：1
6. Motor power：55kw,Frequency Control
7. Heating Section：7 zones

Thermostat Section：4 zones

4.Hydraulic screen exchanger

1.Diameter of the net:φ300mm

2.Time for changing net:≤2 seconds

3.Motor power of hydraulic:2.2kw

4.Pressure:16Mpa

5.Mesh size of filter net:80

5.Die face cutter

1. motor power:2.2kw
2. water pump power: 3kw
3. frequency control

6.Water flume

(1) Made of stainless steel
(2) In I shape cooling
(3)With bigger door for inlet of pellets
(4)Make a block stop before dewatering machine

7.Vertical Dewatering machine

1.Motor power: 5.5kw
2.Stainless steel

8.Vibrating screen

(1)Motor power:0.22kw*2
(2)With double layers in 10mm and 2mm(to select pellets and blocks)
(3)Made of SUS 304

9.Wind blowing system

1.Blower:3kw

10.Storage hopper

1.Volume of the hopper:1 M^3

2.Material: stainless steel

11.Electric panel

1.Motors:Simo

2.Temperature control: Omron (Japan)

3.Inverter: TECO (customized)

4.Contactor:Schneider

5.Main motor current overload protection

6.Mould over-pressure protection(HAOLide Pressure sensor)

Total Discounted Price:64,800USD FOB Shanghai

4.Commercial items

A. Payment：30%T/T as deposit，70%T/T after testing and before shipment.

B. Packing: by film

C. Delivery time: about 60days after received the deposit

D. Warranty year: 1 year

E. Installation power is 210kw (Actual running power consumption percentage: 70%,which is 150kw); besides water consumption: water can be recycled to use, little consumption.

F: Container needed:1*40HQ

G:Space needed: Length*width*Height=18000mm*4000mm*4500mm

After sales service:

Within the guarantee period,if there is any damage for the machine,we will send engineer or substitutes to you for free.After the period,if there is any damage,we can send engineer or substitutes to you,but you should pay all the costs.

H. Spare parts for granulator

NO	DESCRIPTION	QTY

1	Ampere meter	1
2	Thermocouple	2
3	Different specification of heating ring and pipe	One for each
4	Intermediate relay	2
5	Contactor	1
6	Tool box	1
12	The blades of cutter	One set

瑞塑机械
RETECH MACHINERY

Offer No: RT20220826
To: Associated Battery Manufacturers {EA} LTD

Plastic Hard PP Plastic Washing Line

(Capacity:500kg/h)

1. Project introduction:

(1) This Hard Plastic PE material recycling line is composed of crushing part, continuous washing parts and centrifuge & drying parts. It is specially design to deal with the materials like HDPE bottles,Hard PP, etc. The waste bottle will get fully cleaned and dry by our friction washing and squeezing dryer.You can send them to make granules in next step which is for making small pellets directly. This production line is with high automatically operation and labor&energy savings quality. With advanced design concept and constantly advises from our regular customers, we can customized to meet all your specially demands.

(2) This Hard Plastic PE production line could be displayed **"I"** **"L"** **"U"** shapes according to your workshop.

2. Project information:

Space needed	26m*4m*4.5m(L*W*H)
Electric standard	Optional
Electric power	Opening power:140kw(Running power:100kw)

Water consumption	3-4 tons according to design
Labors needed	1-2 workers
Final flakes moisture	Withing 1.5% (Can be put to pelletizing directly)
Machine Color	Customized

3.Layout drawing of this project:

4. Equipment list:

No	Equipment name	Quantity	Power	Price
1	Belt conveyor with metal detector	one	1.5kw	
2	Wet Crusher	one	37kw	
3	Screw Conveyor	one	2.2kw	
4	High Speed friction washer	one	22kw	
5	Floating Washer	one	1.5kw*2	
6	Screw Conveyor	one	3kw	
7	Dewatering Machine	one	22kw	
8	Storage Hopper	one		
9	Electrics panel	one		
Total	**FOB Shanghai**		**87,200USD**	

5. Technical parameters:

1. Belt conveyor with metal detector		(1) Motor power:1.5kw (2) Length of transportation: 4500mm (3) Width of belt:600mm (4) The height can be adjust freely. (5) Material of belt:PVC (6) Thickness of belt:4mm (7)With metal detector, detecting precision:no less than 2mm ***Function:*** To conveying Hard Plastic PP to crusher, and detecting the metals.

2. Crusher		(1) Motor power:37kw (2) Way of crushing: crushing with water (3) Quantity of moving blades :10PCS (4) Quantity of fixed blades: 4PCS (5) Material of blades:SKD-11 (6) Size of rotor:800*560mm (7) The main rotor is with special tempering&heating and balance treatment. (8) Diameter of mesh:80mm (9) With top open motor:0.55kw ***Function:*** To crush the flakes into small flakes,crushing with water is much more efficiently.
3. Screw conveyor		(1) Motor power:2.2kw (2) Diameter of screw:250mm (3) Mesh hole diameter: 3mm (4) With dynamic balance treatment ***Function:*** To rub material and send material to next step.
4. High speed friction washer		(1) Motor power:22kw (2) Diameter of screw:400mm (3) Length:3600mm (4) Speed:1200rpm (5) Made of stainless steel 304. (6) Thickness of blades:5mm ***Function:*** Here is to remove the stubborn stickers from material by high speed rotary to produce the friction force.

5. Floating washer		(1) Motor power:1.5kw*2 (2) Length:4500mm. (3) Width:1320mm. (4) With 4 pushing rollers. (5) Made of stainless steel 304 (6) With side walk frame. ***Function:*** To fully wash the flakes, the rollers will make flakes more unfolded and push them to the end of tank.
6. Screw conveyor		(1) Motor power:2.2kw (2) Diameter of screw:250mm (3) Length:3300mm (4) Made of stainless steel 304. ***Function:*** To convey the PE flakes to next step.
7. Dewatering machine		(1)main motor power: 22kw (2)Rotating diameter: 500mm (3)Length: 1700mm (4)rotary speed of screw: 2000 rpm (5)Blades with resistance (6)hardness treatment (7)The parts contacted with material is made of stainless steel ***Function:*** Removing water by powerful centrifugal to ensure the flakes moisture ≤1.5%.
8. Storage hopper		(1) Volume:1.5m³ (2) Made of stainless steel304 ***Function:*** To storage the dried flakes and packaging.

9. **Electric panel**		(1) Main elements adopts Siemens (2) Omron temperature controller (3) Motor: Simo (4) Contactor: Schneider ***Function:*** To control the whole production line.

6. Commercial items

6.1 Quotation

Total Price: 87,200USD FOB Shanghai

6.2 Term of payment

30% as advance payment by T/T after signing contract; 70% by T/T before delivery

6.3 Delivery

About 60 working days after receiving advance payment.

6.4 Packing

Machine: covered by plastic film.
Container: 2×40HQ sea containers in all.

6.4 Spare parts for free

NO	DESCRIPTION	QTY
1	v-belt for crusher	1 set
2	v-belt for high speed friction washer	2 sets
3	v-belt for dewatering machine	1 set
4	Seals for high speed friction washer	2 sets
5	Seals for floating washer	2 sets
6	Seals for dewatering machine	1 set
7	Button for electric panel	2 PCS
8	Contactor	2 PCS
9	Relay	2 PCS
10	Chain	1 PCS

11	Tool box	2 set

Associated Battery Manufacturers (E.A) Ltd Baseline Ambient Air Quality Measurement Report for The Proposed Plastic Recycling & Manufacture of Plastic Battery Casing & Establishment of Associated Structures in Kajiado County Plot No. Kjd/Kaputei North/33878, Kajiado County.

PREPARED FOR:

Associated Battery Manufacturers (E.A) Ltd

P.O Box 48917 - 00100,

Nairobi - Kenya

batman@abm.co.ke

PREPARED BY:

AIRSENSE ENVIRONMENTAL LAB LTD

P.O. Box 48917-00100

NAIROBI

27th October, 2023

REPORT INFORMATION

REPORT TITLE	**Baseline Ambient Air Quality Measurement Report for Associated Battery Manufacturers (E.A) Ltd Proposed site**
DATE SUBMITTED:	**31 October 2023**
CLIENT:	**Associated Battery Manufacturers (E.A) Ltd**
PROJECT LOCATION:	**Isinya – Kajiado County**
PREPARED BY:	**David Muiruri** ***info@airsense.co.ke***
SIGNED:	
REVIEWER/APPROVER:	**Elijah Muigai** ***info@airsense.co.ke***
SIGNED:	
STATUS	**Final Report**

Client Representative:

Name:

Sign:

Company Stamp

Disclaimer:

The information contained hereon reflects Airsense E.L Ltd findings as at the time of its assessment only and within the limits of the contract with Client. Any unauthorised alteration, forgery or falsification of the content or appearance of this Report is unlawful.

EXECUTIVE SUMMARY

Airsense Environmental Lab Limited was contracted by Associated Battery Manufacturers (E.A) Ltd to carry out baseline ambient air quality assessment to establish the current environmental conditions before the actualisation of their proposed Plastic Recycling and manufacture of plastic battery casing and establishment of associated structures project in Isinya - Kajiado County. The assessment was carried out on 27th October 2023 and involved measurement of concentration of $PM_{2.5}$, PM_{10}, SOx, NOx, CO, CO_2 and TVOCs.

The air samples for each pollutant were picked from predetermined points at the boundaries of the project area and at a point outside the project area as the main receptor point. A field control sample was also obtained. The points of air sampling were determined after site inspection in the company of Associated Battery Manufacturers (E.A) Ltd staff member. The standards used to evaluate the measured values are derived from EMCA (Air Quality) Regulations, 2014 and the WHO ambient air quality standards.

Particulate Dust

From the results analysis in tables 4 and 5, all the points sampled for both PM10 and PM2.5 were within the Environmental Management and Co-ordination (Air Quality), Regulations, 2014.

Oxides of Sulphur (SO2) and Oxides of Nitrogen (NO2)

From the results obtained, all of the points sampled for SO_2 were within the EMCA regulations

The levels of NO_2 results at all the measurement points were within the Environmental Management and Coordination Act (Air Quality), Regulations, 2014.

VOCs

Total VOC levels were all within the Environmental Management and Coordination Act (Air Quality), Regulations, 2014, and the World Health Organization Air quality guidelines.

Carbon Dioxide and Carbon Monoxide (CO2 & CO)

The levels of both Carbon dioxide and carbon monoxide were within the Environmental Management and Co-ordination Act (Air Quality), Regulations, 2014 at all the measurement points assessed.

TABLE OF CONTENTS

Contents

REPORT INFORMATION 2
EXECUTIVE SUMMARY 3
TABLE OF CONTENTS 4
LIST OF TABLES 4
1.0 INTRODUCTION 5
2.0 LEGISLATION AND GUIDELINES 5
2.1 Environmental Management and Co-ordination Act (Air Quality) Regulations, 2014 5
2.2 World Health Organization, Air Quality Guidelines 6
3.0 AIR QUALITY measurements Methodology 8
3.1 Particulate Matter Sampling 8
..... 8
4.0 RESULTS 10
5.0 CONCLUSION AND RECOMMENDATIONS 13
APPENDIX I: GraPHICAL PRESENTATIONS 14
APPENDIX II: PHOTO PLATES 20
APPENDIX IV: EQUIPMENT CALIBRATION CERTIFICATE 22
APPENDIX V: LAB DESIGNATION LETTER 23

LIST OF TABLES

Table 1: EMCA Air Quality Limits 6
Table 2: WHO Air Quality Guidelines 6
Table 3: Description of the site – Associated Battery Manufacturers (E.A) Ltd perimeter sampling points 9
Table 4: PM10 Analysis Results 10
Table 5: PM2.5 Analysis Results 10
Table 6: NO2 & SO2 Analysis Results 11
Table 7: VOC Analysis Results 11

1.0 INTRODUCTION

Airsense E.L Ltd was contracted by Associated Battery Manufacturers (E.A) Ltd to carry out baseline ambient air quality assessment to establish the current environmental conditions before the actualisation of their project in Isinya - Kajiado County. The assessment was carried out on 27th October 2023 and involved measurement of concentration of TSP, $PM_{2.5}$ and PM_{10}, NOx, SOx, CO, CO_2 and VOCs.

The air samples for each pollutant were picked from four points within the project area. The points of air sampling were determined after site inspection in the company Associated Battery Manufacturers (E.A) Ltd staff member. The standards used to evaluate the measured values are derived from EMCA (Air Quality) Regulations, 2014 and the WHO ambient air quality standards.

2.0 LEGISLATION AND GUIDELINES

The company has an environmental policy and action plan designed to ensure that their operations comply with the applicable national legislation, environmental and social safe-guard policies and health and safety guidelines. The air quality assessment results were compared to the ambient air quality tolerance limits set in the Environmental Management and Coordination (Air quality) Regulations, 2014.

2.1 ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT (AIR QUALITY) REGULATIONS, 2014

The client shall ensure that the emission of the priority air pollutants prescribed in the Second Schedule is in adherence to the Ambient Air Quality levels specified in the first Schedule'. The regulations have an objective to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. The first paragraphs-Numbered 58 and 59- of Part XI detail the requirements on monitoring and assessment of ambient air quality, whereas the sixth paragraph- numbered 75- indicate the need for establishment of baseline levels of priority air pollutants set out in the second schedule of the regulation under Part I; General source pollutants and include; particulate matter, nitrogen oxides and sulphur oxides. The limits included in the first schedule of the regulations are shown in the Table 2 overleaf:

Table 1: EMCA Air Quality Limits

EMCA Ambient Air Quality Tolerance Limits		
Pollutant	**TWA**	**Residential Rural & other Areas**
PM_{10}	24 hours**	50
$PM_{2.5}$	24 hours	75
Sulfur Dioxide (SO_2)	24 hours**	125
Nitrogen Dioxide (NO_2)	24 hours	100
Volatile organic carbon (VOC)	24 hours	600
Carbon Monoxide CO	24 hours**	5
Carbon Dioxide CO_2	24 hours	5

2.2 World Health Organization, Air Quality Guidelines

The World Health Organization (WHO) Air Quality Guidelines (AQG) are intended for worldwide use but have been developed to support actions to achieve air quality that protects public health in different contexts. The International Finance Corporation (IFC), Environmental, Health and Safety Guidelines also refer to WHO standards for ambient air quality. The guidelines are in table below.

Table 2: WHO Air Quality Guidelines

Pollutant	Time Weighted Average	Air Quality Guideline
Sulphur Oxides, SOx	24-Hr Mean	20µg/m³
Nitrogen Dioxide, NOx	Annual Mean	40µg/m³
Respirable Particulate Matter (<10µm)	24-Hr Mean	50 µg/m³
$PM_{2.5}$	24-Hr Mean	25 µg/m³

In addition to guideline values, interim targets are given for each pollutant. These are proposed as incremental steps in a progressive reduction of air pollution and are intended for use in areas where pollution is high. These targets aim to promote a shift from high air pollutant concentrations, which have

acute and serious health consequences, to lower air pollutant concentrations. If these targets were to be achieved, one could expect significant reductions in risks for acute and chronic health effects from air pollution. Progress towards the guideline values should, however, be the ultimate objective of air quality management and health risk reduction in all areas.

3.0 AIR QUALITY MEASUREMENTS METHODOLOGY

3.1 Particulate Matter Sampling

The AQM-09 Air Quality Monitoring Station can measure both outdoor and indoor air pollutants in real-time, measuring data quickly and accurately. It can be customized for different applications demands, the measurement parameter can be chosen from the following: the gas type Ozone(O3), Nitrogen Dioxide (NO2), Sulphur Dioxide (SO2), Carbon Monoxide (CO), TVOCs, Particulate matter PM2.5 and PM10, also the Noise, Meteorological parameters (including of Temperature, Humidity, Wind speed, Wind direction, Barometric pressure), etc.

Installed with the famous brand sensor, with quick response, good linearity, stable performance and high resolution, the minimum unit up to ppb;

Designed with the all-in-one type and easy installation;

The modular design makes the later maintenance very convenient;

With the function of remote parameter correction, can save the costs;

With the built-in pump, respond quickly more than the normal diffusion sampling type;

With the Double-layer protection box, preventing it from external environment influence;

It's with the Wireless network adapter, transmitting the data by GPRS, also with optional RS232 connection to display the data on the LED display screen;

Table 3: Description of the site – Associated Battery Manufacturers (E.A) Ltd perimeter sampling points

Monitoring Point	Description of the sampling point	GPS Coordinates
MP1	The point is located at the tank area	S1⁰45'22.516" E36⁰55'34.214"
MP2	The Point is located at the center of the proposed project area	S1⁰45'22.608" E36⁰55'34.254"
MP3	The point is located at the gate area	S1⁰45'11.508 E36⁰55'27.528
MP4	This is a receptor point located outside the project area; point nearest to residential area	S1⁰45'21.138" E36⁰55'28.188"

4.0 RESULTS

Table 4: PM10 Analysis Results

Location	Time (hrs)	Concentration µg/m³			WHO Air Quality Guidelines PM_{10}	EMCA (Air Quality) Reg. 2014
		AVG	**MAX**	**MIN**		
MP1	24hrs	**7.0**	12	5	**50 µg/m³ 24hrs**	**50 µg/m³ 24hrs**
MP2	24hrs	**7.5**	23	4		
MP3	24hrs	**7.0**	13	4		
MP4	24hrs	**6.6**	10	4		

Table 5: PM2.5 Analysis Results

Location	Time (hrs)	Concentration µg/m³			WHO Air Quality Guidelines PM_{10}	EMCA (Air Quality) Reg. 2014
		AVG	**MAX**	**MIN**		
MP1	24hrs	**4.2**	6	2	**25 µg/m³ 24hrs**	**75 µg/m³ 24hrs**
MP2	24hrs	**3.0**	11	2		
MP3	24hrs	**2.8**	6	2		
MP4	24hrs	**2.4**	4	2		

From the results analysis in tables 4 & 5 above, all the points sampled for both PM_{10} and $PM_{2.5}$ were within the Environmental Management and Co-ordination (Air Quality), Regulations, 2014 and WHO guidelines. However

Table 6: NO2 & SO2 Analysis Results

Location	Time (hrs)	NO_2 Concentration µg/m³	SO_2 Concentration µg/m³	EMCA (Air Quality) Reg. 2014	WHO Air Quality Guidelines
MP1	24hrs	**4.1**	**2.4**	**NO_2 – 100 µg/m³** **SO_2 – 125 µg/m³**	**NO_2- 40 µg/m³** **SO_2-20 µg/m³**
MP2	24hrs	**4.0**	**1.3**		
MP3	24hrs	**4.1**	**2.2**		
MP4	24hrs	**3.7**	**2.1**		

Table 7: VOC Analysis Results

Location	Time (hrs)	TOTAL VOC	EMCA (Air Quality) Reg. 2014
MP1	24hrs	**1.9**	**VOC – 600 µg/m³**
MP2	24hrs	**2.1**	
MP3	24hrs	**2.2**	
MP4	24hrs	**1.4**	

Location	Time (hrs.)	CO Concentration mg/m^3	CO_2 Concentration mg/m^3	EMCA (Air Quality) Reg. 2014
		AVG	**AVG**	
MP 1	**24hrs**	**0.1**	**1.133**	**5 mg/m^3**
MP 2	**24hrs**	**0.1**	**1.042**	
MP 3	**24hrs**	**0.1**	**1.063**	
MP 4	**24hrs**	**0.0**	**1.043**	

5.0 CONCLUSION AND RECOMMENDATIONS

Particulate Dust

From the results analysis in tables 4 and 5, all the points sampled for both PM_{10} and $PM_{2.5}$ were within the Environmental Management and Co-ordination (Air Quality), Regulations, 2014.

Oxides of Sulphur (SO2) and Oxides of Nitrogen (NO2)

From the results obtained, all of the points sampled for SO_2 were within the EMCA regulations The levels of NO_2 results at all the measurement points were within the Environmental Management and Coordination Act (Air Quality), Regulations, 2014.

VOCs

Total VOC levels were all within the Environmental Management and Coordination Act (Air Quality), Regulations, 2014, and the World Health Organization Air quality guidelines.

Carbon Dioxide and Carbon Monoxide (CO2 & CO)

The levels of both Carbon dioxide and carbon monoxide were with the Environmental Management and Co-ordination Act (Air Quality), Regulations, 2014 at all the measurement points assessed.

APPENDIX I: GRAPHICAL PRESENTATIONS

Figure 1 MP1 PM 2.5

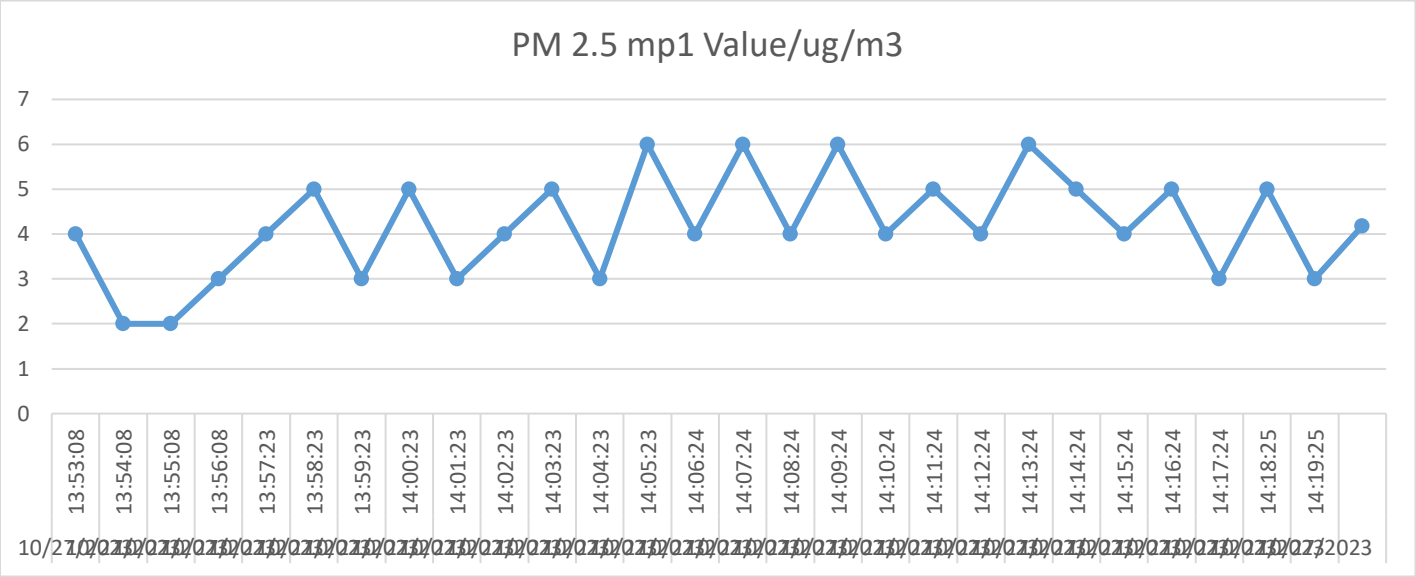


Figure 2 MP2 PM 2.5

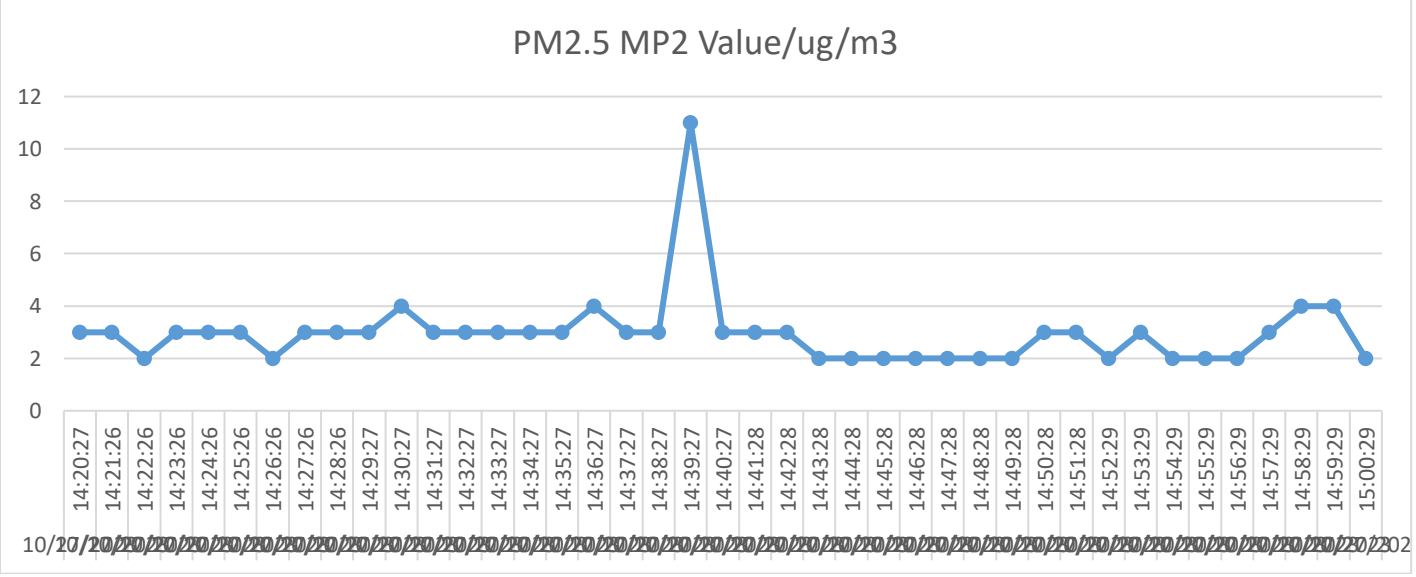


Figure 3 MP3 PM 2.5

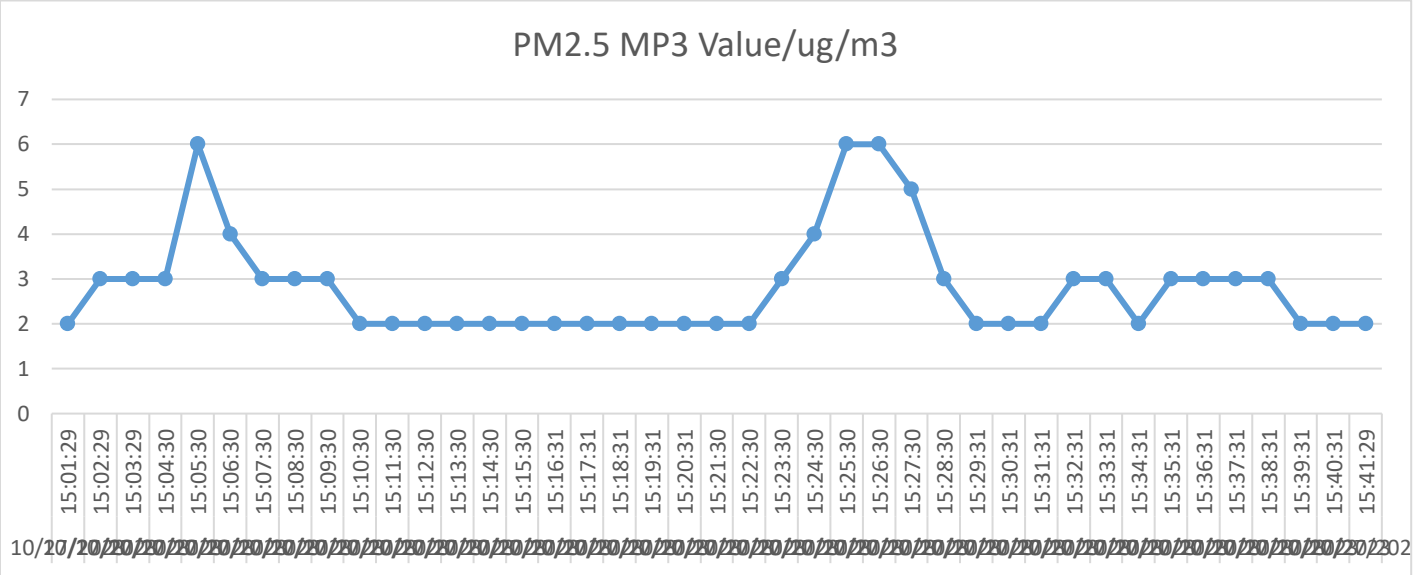


Figure 4 MP4 PM 2.5

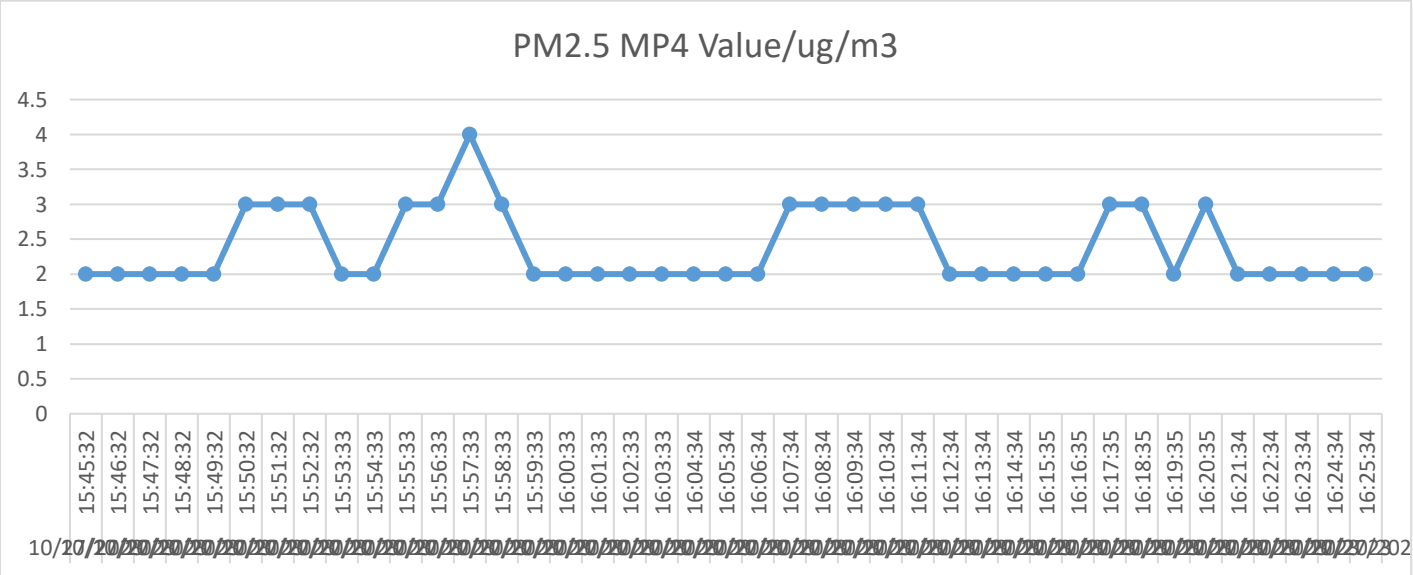


Figure 5 MP1 PM 10

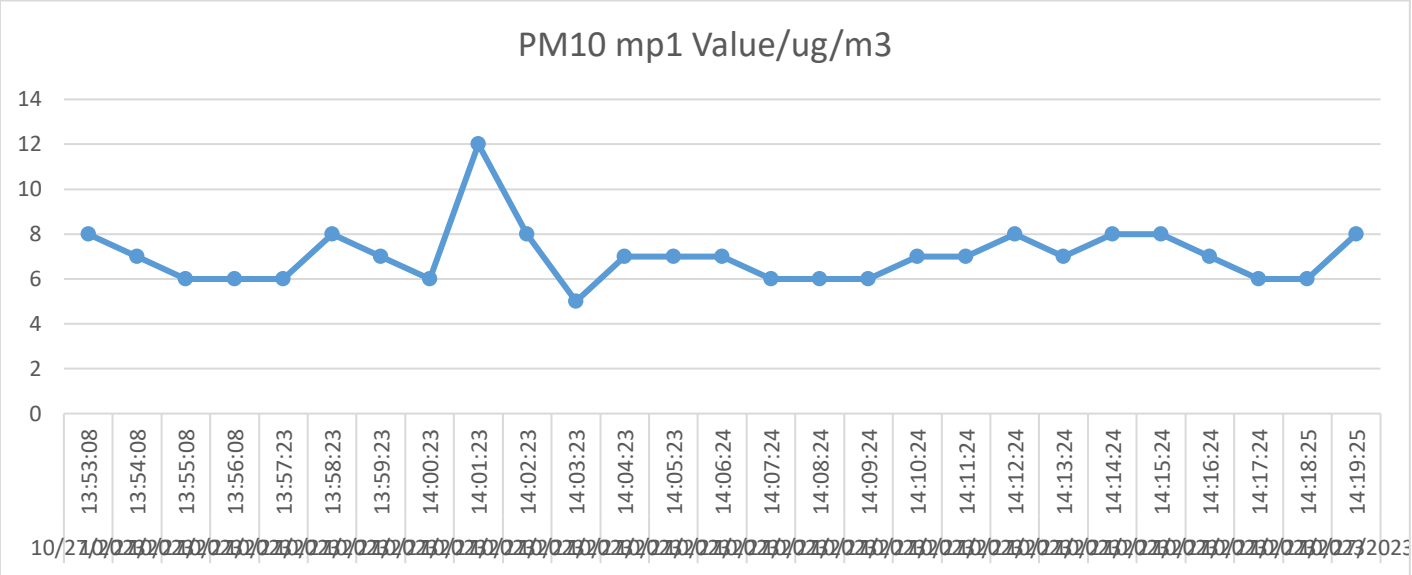


Figure 6 MP2 PM 10

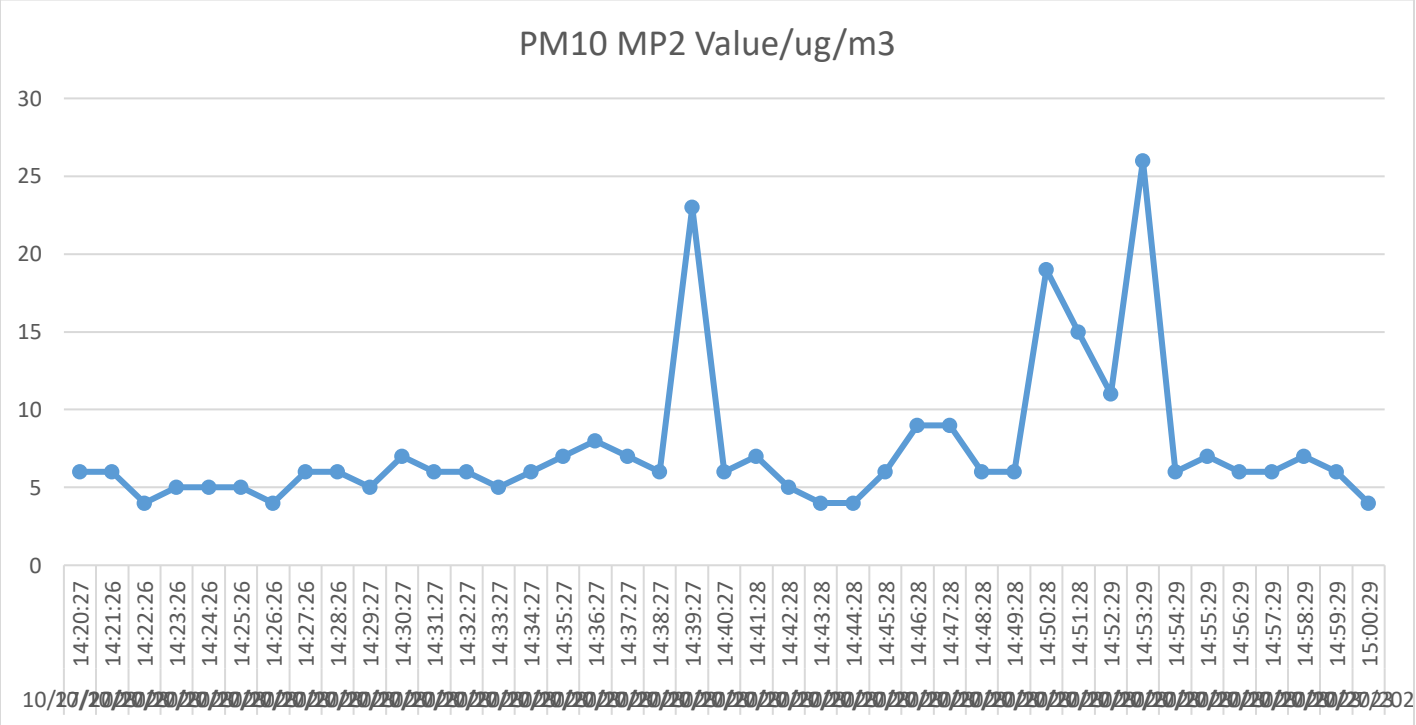


Figure 7 MP3 PM 10

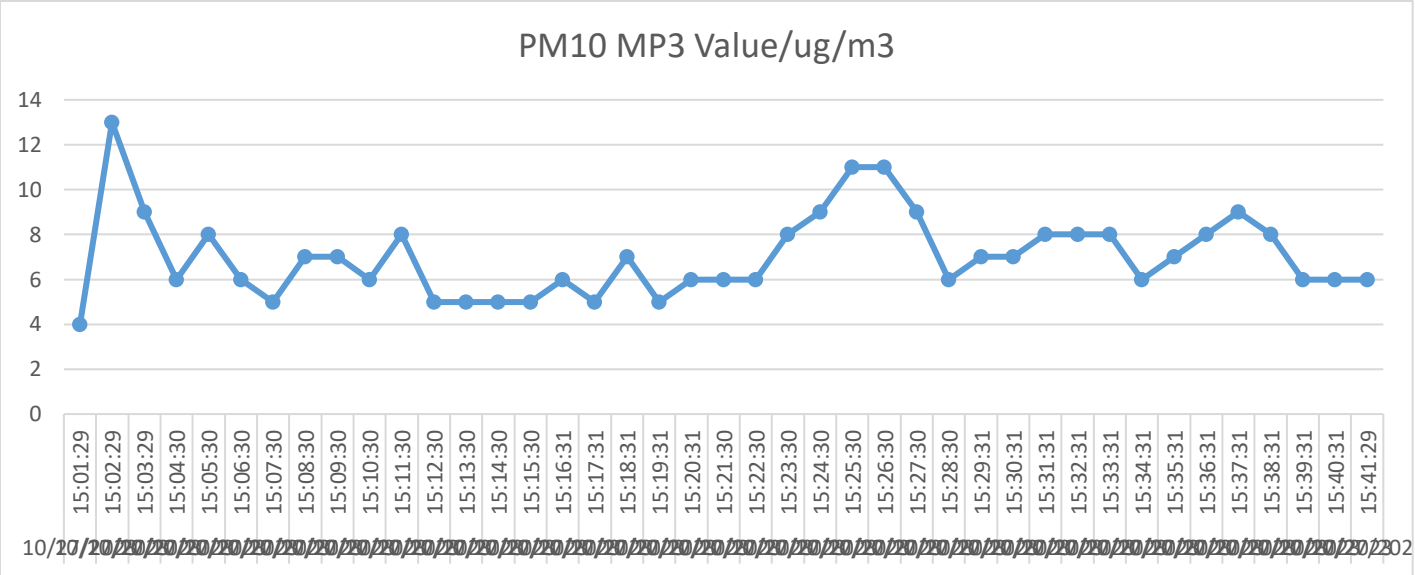


Figure 8 MP4 PM 10

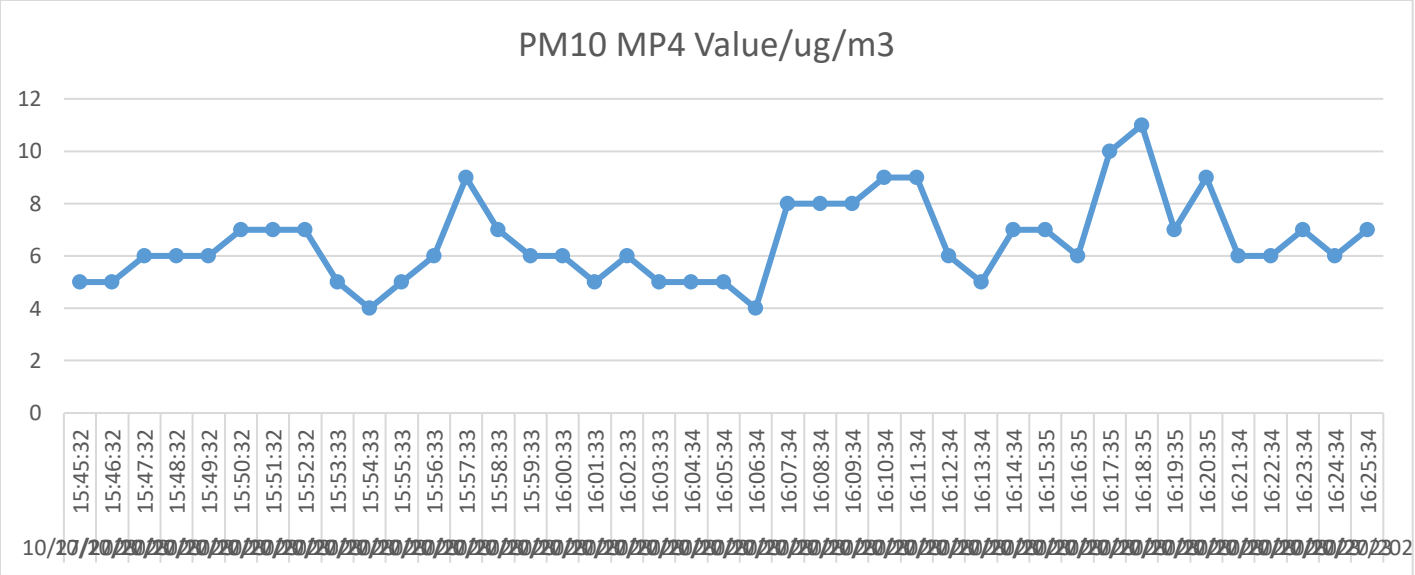


Figure 9 MP1 NOX

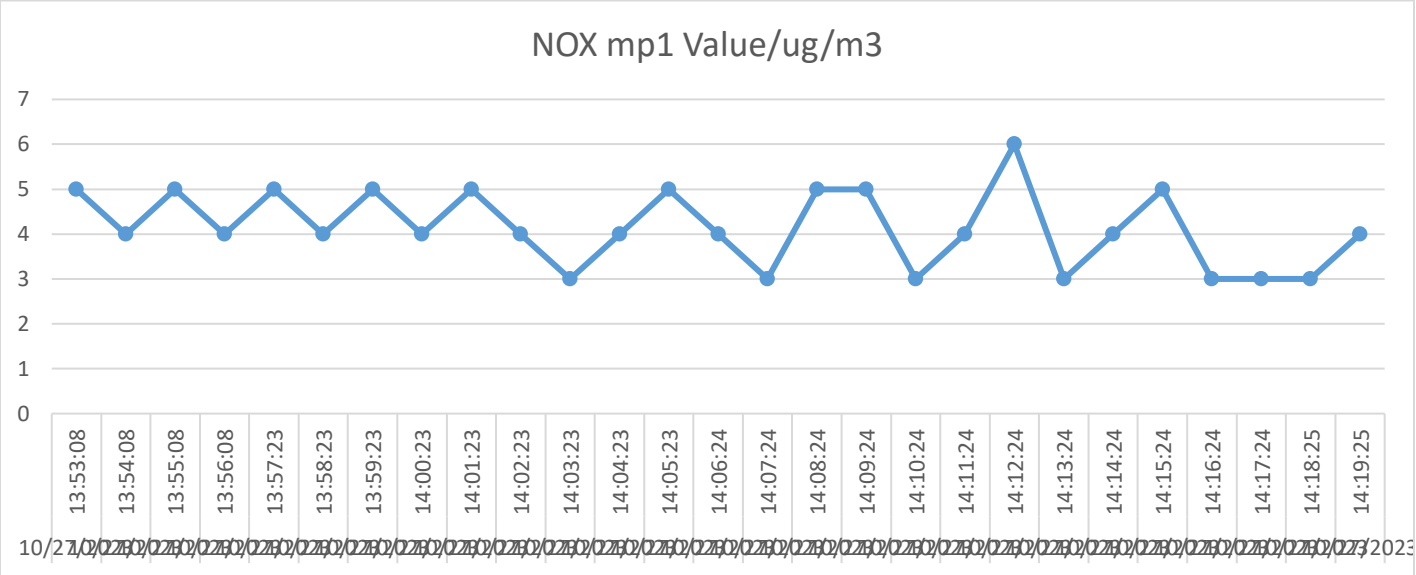


Figure 10 MP2 NOX

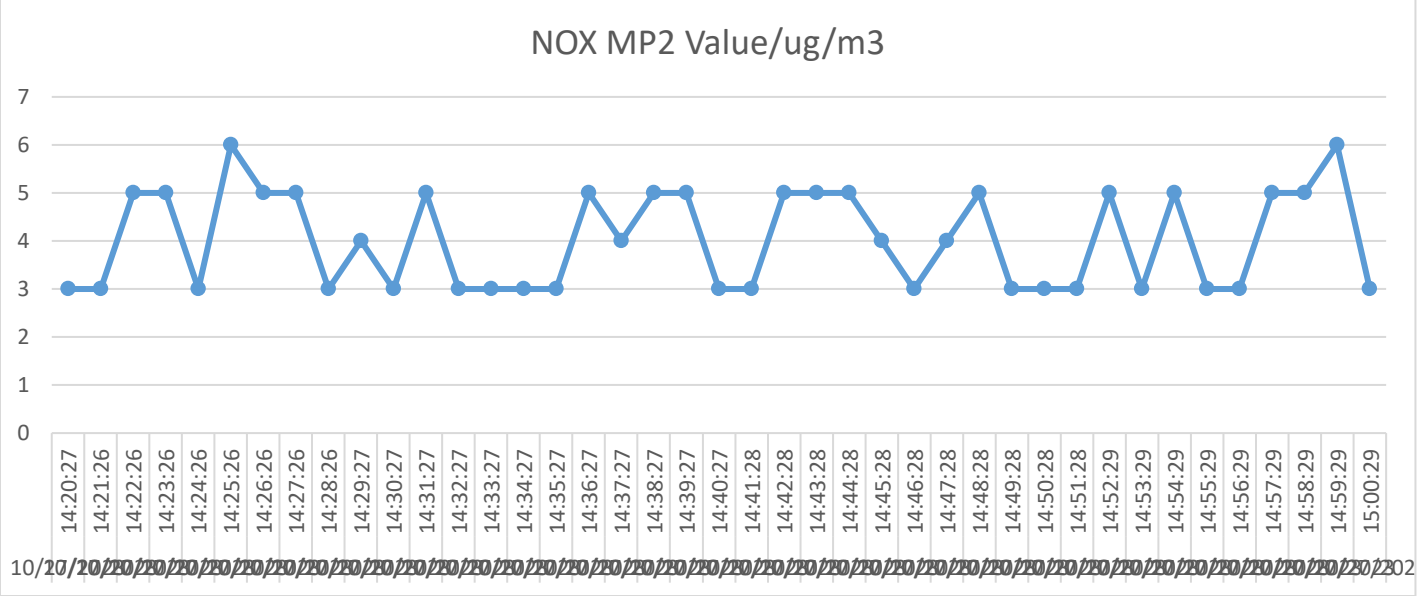


Figure 11 MP3 NOX

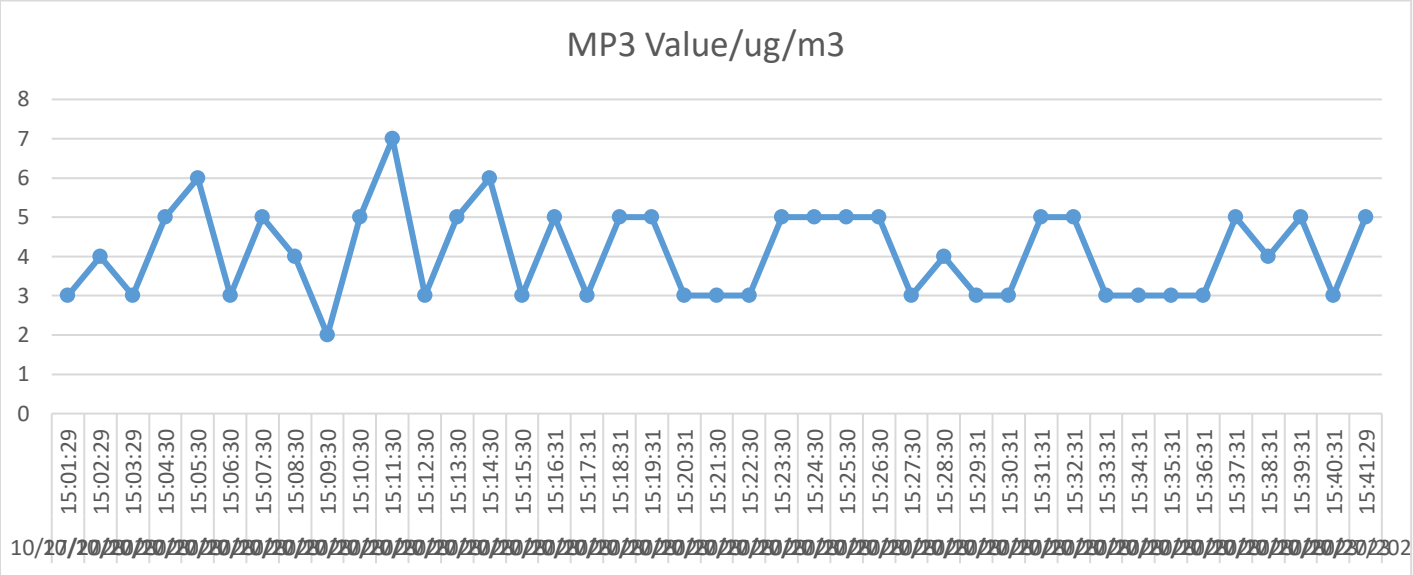


Figure 12 MP4 NOX

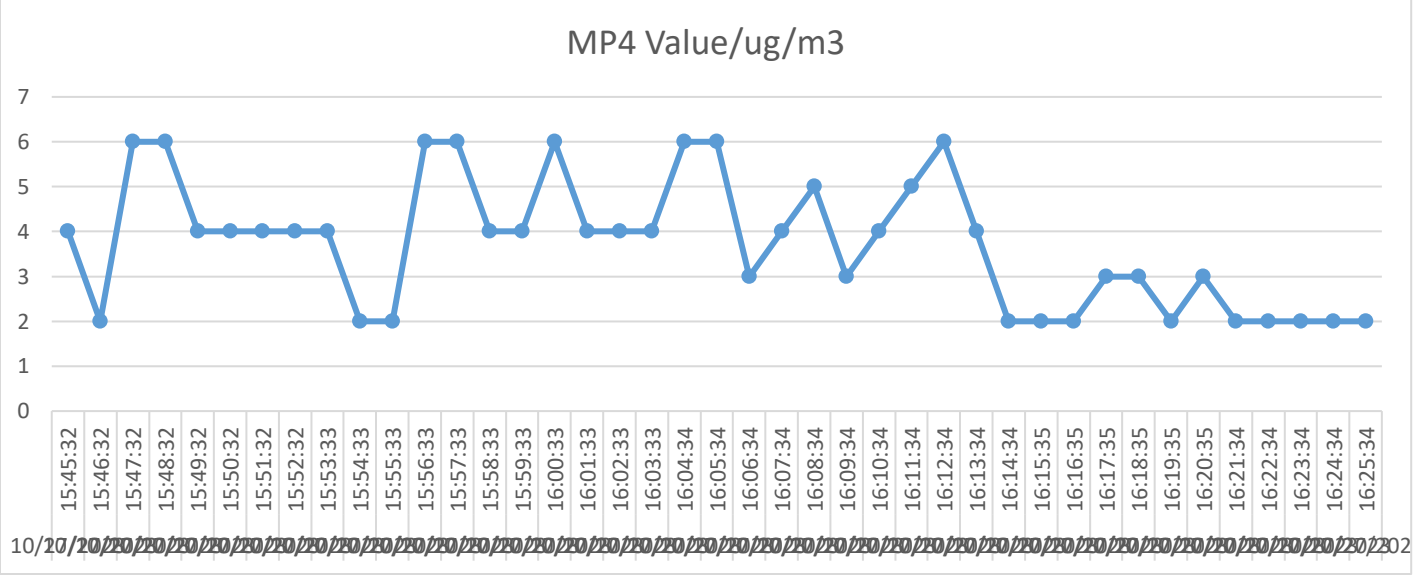


Figure 2

APPENDIX II: PHOTO PLATES

	Measurement in progress around the Tank area – MP1
	Measurement in progress at the center of the proposed project area - MP2

	Measurement in progress at the Gate area- MP3
	Measurement in progress at the receptor point located outside the project area; point nearest to residential area - MP4

APPENDIX IV: EQUIPMENT CALIBRATION CERTIFICATE

Calibrate report

Product	Air Quality Monitor System	Model	AQM-09
Quantity	1pcs	Cali date	February,15, 2023
Product No.	OC210203296083		
Appearance	☑Clean ☑Non corrosive ☑No damage		
Gas type	NO2:ppb SO_2:ppb CO:ppm O3:ppb PM2.5:ug/m³ PM10:ug/m³ TSP:ug/m³ Wind veloci: m/s Wind direct:° Atmospheric : hpa Temperature and humidity: ℃/%RH		
Accuracy	±3%F.S		
resolution	0.1ppm 1ppb 1ug/m³		
Response time	≤30S		
Survey range	SO_2:0-2000ppb CO:0-200ppm NO2: 0-2000ppb O3:0-2000ppb PM2.5:0-1000ug/m³ PM10:0-1000ug/m³ PM1 : 0-1000ug/m³ TSP : 0-1000ug/m³ Windveloci:0-30m/s Winddirect:0-360° Atmospheric :600-1100 hpa Temperature: -20-50℃ Humidity:0%-100%RH		
Signal output mode	4G LTE		
Power supply voltage	AC 220V/50Hz		
Power dissipation	≤ 30W		
Working temperature and humidity range	-20℃-50℃ / 0%RH-100%RH		
Testing condition indoor	Temperature: 25℃ Humidity: 60%RH		
Calibration gas	CO SO2 O3 NO2		
Cali gas test	1.CO: Cali gas concentration: 100 ppm Inspect concentration: 98.7 ppm 2.SO_2: Cali gas concentration: 1000 ppb Inspect concentration: 998 ppm 3.O3: Cali gas concentration: 1000 ppb Inspect concentration: 997 ppm 4.NO2: Cali gas concentration: 1000 ppb Inspect concentration: 998 ppm 5.PM2.5:Measured value: 45 ug/m³ TSP:Measured value: 51 ug/m³ 6.PM10:Measured value: 59 ug/m³ Wind direct:Measured value : 319 ° 7.Wind veloci:Measured value: 1.4 m/s Atmospheric :Measured value: 1002 hpa 8.Temperature: Measured value: 24.1 ℃ Humidity:Measured value: 52 %RH		
Test result	Qualified		
Remark			

Quality judgment:

Tester: xiu tai chen

Company: Henan Oceanus Import & Export Co., Ltd.

OQC : hong yan jin

Date:February,15, 2023

Auditor: yan hui wang

APPENDIX V: LAB DESIGNATION LETTER

nema
mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Mobile Lines: 0724-253 398, 0723-363 010, 0735-013 046
Telkom Wireless: 020-2101370, 020-2183718
Incident Lines: 0786-101100, 0741-101100

P.O. Box 67839, 00200
Popo Road, Nairobi, Kenya
E-mail: dgnema@nema.go.ke
Website: www.nema.go.ke

NEMA/21/2/LAB 65/AELL **18th February, 2022**

AirSense Environmental Lab Ltd
6th Floor, Room 6C, Lakeoil Plaza,
Along Lunga Lunga Road,
P.O Box 15225-00400,
NAIROBI

RE: LABORATORY DESIGNATION BY NEMA.

Pursuant to your application for designation, your laboratory was inspected and evaluated based on ISO 17025 for laboratory competence to carry out tests and samplings.

The AirSense Environmental Lab Ltd qualified and has in principle been designated to undertake **Air Quality analysis and Noise Level Measurements** subject to the attached terms and conditions.

However, pursuant to section 119 of EMCA 1999 the Gazettement will take effect once the Authority places a notice in the Kenya Gazette.

ALI MWANZEI
For: DIRECTOR GENERAL

Our Environment, Our Life, Our Responsibility

ISO 9001:2015 Certified

October 2023

BASESLINE ENVIRONMENTAL NOISE MEASUREMENT REPORT FOR THE PROPOSED PLASTIC RECYCLING & MANUFACTURE OF PLASTIC BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES IN KAJIADO COUNTY PLOT NO. KJD/KAPUTEI NORTH/33878, KAJIADO COUNTY.

Client: Associated Battery Manufacturers (E.A) Ltd

FINAL REPORT

PREPARED FOR:

Associated Battery Manufacturers (E.A) Ltd
P.O BOX 48917-00100
Nairobi-Kenya

Prepared by,
Airsense Environmental Lab Ltd

1.0 REPORT INFORMATION

REFERENCE	AELL/010-027
REPORT TITLE	Baseline Environmental Noise Measurement Report
DATE SUBMITTED:	31 October 2023
CLIENT:	Associated Battery Manufacturers (E.A) Ltd
PROJECT LOCATION:	Isinya - Kajiado County Plot No. Kjd/Kaputei North/33878, Kajiado County
PREPARED BY:	David Muiruri Email: info@airsense.co.ke
SIGNED:	
REVIEWER/APPROVER:	Elijah Muigai Email: info@airsense.co.ke
SIGNED:	
STATUS	
AIRSENSE ENVIRONMENT LAB	Company Stamp

Client Representative:

Signature:

Stamp:

Disclaimer:

The information contained hereon reflects Airsense Environmental Lab findings as at the time of its assessment only and within the limits of the contract with Client. Any unauthorised alteration, forgery or falsification of the content or appearance of this Report is unlawful.

TABLE OF CONTENTS

TABLE OF CONTENTS **3**

GLOSARRY OF TERMS **5**

EXECUTIVE SUMMARY **6**

2.0 INTRODUCTION **7**

2.1 PROJECT BACKGROUND INFORMATION 7
2.2 PROJECT OBJECTIVES 7
2.3 REPORT STRUCTURE 7

3.0 SCOPE OF WORKS **8**

3.1 APPROACH 8
3.2 QUALITY CONTROL 8

4.0 LEGISLATION AND GUIDELINES **9**

4.1 NOISE AND EXCESSIVE VIBRATION POLLUTION CONTROL REGULATIONS 9
4.2 IFC/WORLD BANK ENVIRONMENTAL, HEALTH AND SAFETY GUIDELINES (APRIL, 2007) 10
4.3 WORLD HEALTH ORGANIZATION, GUIDELINES FOR COMMUNITY HEALTH 10
4.4 NOISE SOURCES 11

5.0 METHODOLOGY **12**

5.1 ENVIRONMENTAL NOISE MEASUREMENT POINTS 12
5.2 MEASUREMENT PROCEDURE 13
5.3 MEASUREMENT INSTRUMENTS 13

6.0 MEASUREMENT RESULTS **14**

6.1 ENVIRONMENTAL NOISE MEASUREMENT RESULTS 14

7.0 CONCLUSION **15**

7.1 APPENDIX II: PHOTOGRAPHIC REPORT 16
7.2 APPENDIX III: EQUIPMENT CALIBRATION CERTIFICATE 20

LIST OF TABLES

Table 0-1: Associated Battery Manufacturers (E.A) Ltd Diurnal Baseline Environmental Noise Level Results 13-03-2023 ---- 6
Table 4-1: LEGAL NOTICE NO.61: Noise and Excessive Vibrations Pollution Regulations ---- 9
Table 4-2: (WB/IFC Group) Noise Management Guidelines ---- 10
Table 4-3: WHO Guidelines for community noise in specific environments ---- 10
Table 5-1: Environmental Noise Measuement Points ---- 12
Table 6-1: Associated Battery Manufacturers (E.A) Ltd Diurnal Baseline Environmental Noise Level Results 13-03-2023 ---- 14

LIST OF FIGURES

Figure 1 MP1 ---- 18
Figure 2 MP2 ---- 18
Figure 3 MP3 ---- 19
Figure 4 MP4 ---- 19

LIST OF BOXES

Box 3-1: Summary of the Project scope ---- 8
Box 3-2: Noise measurement approach ---- 8
Box 4-1: Main Noise Emisions Sources ---- 11
Box 5-1: Summary of measurement Procedure ---- 13
Box 5-2: Noise measurement equipments ---- 13

GLOSARRY OF TERMS

Ambient Noise	The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.
dB	Decibels
dB(A)	Unit representing the sound level measured with the A weighting network of a sound level meter. A- Weighted filter is an electronic circuit whose sensitivity to sound pressure levels varies in the same way as the human ear.
EMCA	Environmental Management Coordination Act
GPS	Global Positioning System
ISO	International Standard Organization
IFC	Intenational Finance Corporation
LA10	Those noise levels that are exceeded for 10% of each sample period
LA50	Those noise levels that are exceeded for 50% of each sample period
LA90	Those noise levels that are exceeded for 90% of each sample period
LAeq	Value of A-weighted sound pressure level of a continuous steady sound that, within a specified interval, has the same mean square sound pressure as a sound under consideration whose level varies with time.
LAmax	Maximum sound pressure level obtained during the measurement period.
LAmin	Minimum sound pressure level obtained during the measurement period.
MW	Megawatts
MSD	Medium Speed Diesel
NEMA	National Environmental Management Authority
Noise	Any sound, that has the potential to cause disturbance, discomfort or psychological stress to a subject exposed to it, or any sound, that could to cause actual physiological harm to a subject exposed to it, or physical damage to any structure exposed to it, is known as noise.
Noise sensitive Locations	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels
WHO	World Health Organization

EXECUTIVE SUMMARY

Associated Battery Manufacturers (E.A) Ltd contracted Airsense Environmental Lab Ltd to undertake baseline noise assesment survey at their project area in Isinya - Kajiado County. The noise level measurements were undertaken on the 27th October 2023 at the perimeter of the the premise.

The objective of this survey was to provide noise data to determine the baseline noise levels before the actualisation of the project, in relation to applicable guidelines. The measurements were carried out during diurnal schedules at various pre determined points.

The noise environment at all monitoring locations were characterized with the main noise sources of reported levels being from the nearby road and birds' chirpings.

The **Diurnal noise** measurement results as shown in Table 5.1 indicate that the noise levels at all the monitoring points were within both the IFC guideline limit of 70 dB (A) and local legislation and guidelines; the Excessive Noise and Vibration Control Rules, 2009 (Legal Notice No. 61) limit of 55dB mixed residential and commercial areas. The main sources of reported levels can be attributed to the vehicular traffic on the adjacent road and birds chirping.

Table 0-1: Associated Battery Manufacturers (E.A) Ltd Diurnal Baseline Environmental Noise Level Results 27-10-2023

ID	Point Of Measurement	LAeq	LAmax	LAmin	LApeak	**Limits**
TAG 001	Tank Area	**36.5**	70.2	58.1	33.2	55dB
TAG 002	Center of the proposed project area	**35.7**	69.4	58.4	32.9	
TAG 003	Gate area	**36.8**	69.8	58.5	33.5	
TAG 004	Receptor point located outside the project area; point nearest to residual area	**36.4**	69.7	58.6	33.1	

2.0 INTRODUCTION

2.1 Project Background Information

Associated Battery Manufacturers (E.A) Ltd is a proposed site located in Isinya – Kajiado County, Kenya that will be involved in Plastic recycling and manufacture of plastic battery casing and establishment of associated structures.

Airsense Environmental Lab Ltd was contracted by Associated Battery Manufacturers (E.A) Ltd to undertake baseline environmental noise measurement in order to determine existing noise levels emitted before the actualisation of the project. This report therefore presents the findings of the baseline environmental noise measurement undertaken on the 27th October 2023.

2.2 Project Objectives

The primary objective of this noise measurement survey was to provide a comprehensive baseline noise of measurement report that presents the findings and conclusion of the project related noise sources impacting both the internal and external environment of the project area, and to ensure its operations are carried out in the most sustainable manner that is compatible with its economic and operational parameters and is compliant with the local environmental noise and excessive vibration guidelines as well as the IFC/World bank Environmental and Social Health (EHS) standards on the maximum allowable noise exposure allowed within and beyond the plants boundary perimeter.

2.3 Report Structure

The following chapter presents the projects approach and scope of works. Chapter 3.0 presents the legal framework guidelines for maximum allowable noise. The methodology, measurement procedure and instruments used for the noise measurement survey is presented in chapter 4.0. The results of the measurements are presented and discussed in chapter 5.0. Chapter 6.0 of this report presents the conclusions of the report.

3.0 SCOPE OF WORKS

The scope of the project was to undertake Baseline Environmental noise measurement in accordance with the Environmental Management and Coordination guidelines on noise and excessive vibration pollution. A Summary of the scope is shown in the **Box 2.1** below.

Box 3-1: Summary of the Project scope

- Measurement of the baseline background Noise at at the boundary of the project area.
- compare the results with the acceptable limits according to the reference country legislation and also the IFC world bank
- Compile the findings of the noise assessment in a final report.

3.1 Approach

The following approach was adapted and used in determining the potential noise level impacts during the plants main operations. **Box 3.2** below presents a summary of the approach adapted for the noise measurement

Box 3-2: Noise measurement approach

- Measurement of the existing background Noise at the boundary of the project area;
- The noise measurement carried out on the 27th October 2023 at 4 monitoring points as indicated in this report.
- The ambulant measurements were executed during a period of 30 minutes.
- Assessment of the impact of the facility baseline noise and related activities by comparing the measured results with the acceptable limits of EMCA legislation and IFC World bank.
- Compile the findings of the noise assessment in a final report.

3.2 Quality Control

All acoustic equipment used during the measurements was duly calibrated to a traceable standard. Field checks were performed before and after each monitoring session. The full details of the noise level meter and noise level meter calibrator is provided along with the current calibration certificates. Identification of each of the measurement location was by GPS coordinates and photographic reports. A written record and subjective notes for any extraneous noise events were also logged for the measurement periods.

4.0 LEGISLATION AND GUIDELINES

The ambient noise levels (existing measurements + particular noise of the project) were evaluated against the local legislation and guidelines; the Excessive Noise and Vibration Control Rules, 2009 (Legal Notice No. 61). Additionally, The World Bank (IFC) Environmental, Health and Safety Guidelines and the World Health Organization Guidelines are used.

4.1 Noise And Excessive Vibration Pollution Control Regulations

The EMCA, 1999 part 101 provides for NEMA-Kenya to recommend guidelines for the abatement of unreasonable noise and vibration pollution emitted into the environment from any source. Pursuant to this, the Noise and excessive vibration pollution control regulations, 2009 (Legal Notice No. 61) were developed.

The Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009 sets out maximum permissible noise levels in the First Schedule of the Regulation for various zones. Part IV of the regulations state that where a sound source emits noise which fail to comply with provisions of the Regulations, such person shall apply for a license to the Authority. **Table 4-1** below shows the different guideline values for different zone

Table 4-1: LEGAL NOTICE NO.61: Noise and Excessive Vibrations Pollution Regulations

Zone		Sound Level Limit dB(A) **(Leq, 14h)**		Noise Rating levels (NR) **(Leq, 14h)**	
Time Frame Day**: 6:01am- 8:00 pm (Leq. 14h)** Night**: 8:01pm-6:00 am (Leq. 10h)**		**Day**	**Night**	**Day**	**Night**
A	Residential:Outdoor	**50**	**35**	**40**	**25**
B	Mixed Residential (with some commercial and places of entertainment)	**55**	**35**	**50**	**25**
C	Commercial	**60**	**35**	**55**	**25**

4.2 IFC/World Bank Environmental, Health and Safety Guidelines (April, 2007)

IFC Noise Management Guidelines propose that where predicted or measured noise impacts from a project exceed the applicable noise level guideline at the most sensitive point of reception, noise prevention and mitigation measures be put in place. The guidelines indicate that for industrial and commercial areas, noise levels should not exceed 70 dB (A). Residential, institutional and educational areas, noise levels should not exceed 55 dB (A) during day (07:00 to 22: 00 Hrs) and 45 dB (A) during night (22:00 to 07:00 Hrs). In both cases a maximum increase of 3 dB (A) is allowed where background noise already exceeds the guideline value.

Table 4-2: (WB/IFC Group) Noise Management Guidelines

Receptor	One Hour LA_{eq} (dBA)	
	07:00 – 22:00hrs	**22:00 – 07:00hrs**
Residential; institutional; Educational	55	45
Industrial; commercial	70	70

4.3 World Health Organization, Guidelines for Community Health

Table 4-3: WHO Guidelines for community noise in specific environments

Specific Environment	Critical health Effects	LAeq (dB)	Time Base (Hrs.)	LAmax, (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
School, playground Outdoor	Annoyance (External source)	55	During play	-
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24 Hr	110

4.4 Noise Sources

The measurements were taken during the club operations and the following are the main noise sources at the project area;

Box 4-1: Main Noise Emisions Sources

Noise from the nearby commercial area;

Vehicular movement from the adjacent road.

Project preparation activities

5.0 METHODOLOGY

The environmental noise level measurements were carried out with respect to the ISO 1996, Acoustics – Description and Measurement of Environmental Noise, as shown below comprising the following:

- Part 1: Basic quantities and procedures;
- Part 2: Acquisition of data pertinent to land and land use.
- Part 3: Application to noise limits.

The following subsections describe the methodology used in performing the noise measurements. Section 4.1 below shows the noise measurement locations and the probable sources of noise. The noise measurement procedure and the instruments used are discussed in section 4.2 and 4.3 of this chapter.

5.1 Environmental Noise measurement points

The Environmental noise measurement was undertaken at the following premises within the plant's premises and immediate vicinity.

Table 5-1: Environmental Noise Measuement Points

ID	Measuring Point	GPS Coordinates	Noise Sources
TAG 001	Tank Area	S1^{0}45'22.516" E36^{0}55'34.214"	Birds chirping, Security guards conversing
TAG 002	Center of the proposed project area	S1^{0}45'22.608" E36^{0}55'34.254"	Birds chirping
TAG 003	Gate area	S1^{0}45'11.508 E36^{0}55'27.528	Birds chirping, Vehicular noise at adjacent road Security guards conversing
TAG 004	Receptor point located outside the project area; point nearest to residual area	S1^{0}45'21.138" E36^{0}55'28.188"	Birds chirping, Vehicular noise at adjacent road Security guards conversing

TAG: Noise measurement points

5.2 Measurement Procedure

For all the measuring points a duly calibrated Type 1 Precision impulse integrating Sound level meter set at fast response was used. Field calibration checks were done before and after each measurement schedule. Eleven monitoring points were identified for measurements to determine the environmental noise levels. Measurements were done during the Diurnal and nocturnal (daytime) schedule.

The measurements were done for a period of 10 minutes at each of the monitoring locations and sessions logs done after every ten seconds. For each session the LA_{eq}, LA_{Max}, LA_{Min}, $LA_{peak\ (max)}$, LA_{10}, LA_{50}, LA_{90} and the probable sources of noise were recorded. In addition, the procedures in **box 4.1 belo**w were applied during the measurement period

Box 5-1: Summary of measurement Procedure

- Inspection of the monitoring locations and the implicated activities;
- Compiling photographic reports of the monitoring locations and surroundings;
- Identification of the environmental measurement points with a GPS;
- Calibration of the sound level meter before and after each measurement;
- At all positions the microphone was mounted on a tripod approximately 1.5m above ground level;
- Noise levels expressed in decibels, A-weighted sound pressure level (dBA).

5.3 Measurement Instruments

The noise measurement instruments used for the activity are as shown in **box 4.2** below

Box 5-2: Noise measurement equipments

- Precision Type 1 accuracy Integrating Sound Level Meter -Serial Number 0004897 - (Manufacturers: Larson and Davis Model 824 SLM). \
- Tripod Stand.
- Acoustic Calibrator- (The sound level meter was calibrated before and after the measurements as per method requirements)
- Open Field Microphone.
- GPS, Germin eTrex 12-Channel.
- Digital camera.

The Calibration certificates for the acoustic instruments are attached in Appendix III of this report.

6.0 MEASUREMENT RESULTS

6.1 Environmental Noise Measurement Results

The noise measurements were carried out during the Diurnal and Nocturnal schedule within the vicinity of the company and the immediate road during the normal company operations with other associated activities ongoing. **Tables 6-1** below present obtained diurnal and nocturnal results.

Table 6-1: Associated Battery Manufacturers (E.A) Ltd Diurnal Baseline Environmental Noise Level Results 27-10-2023

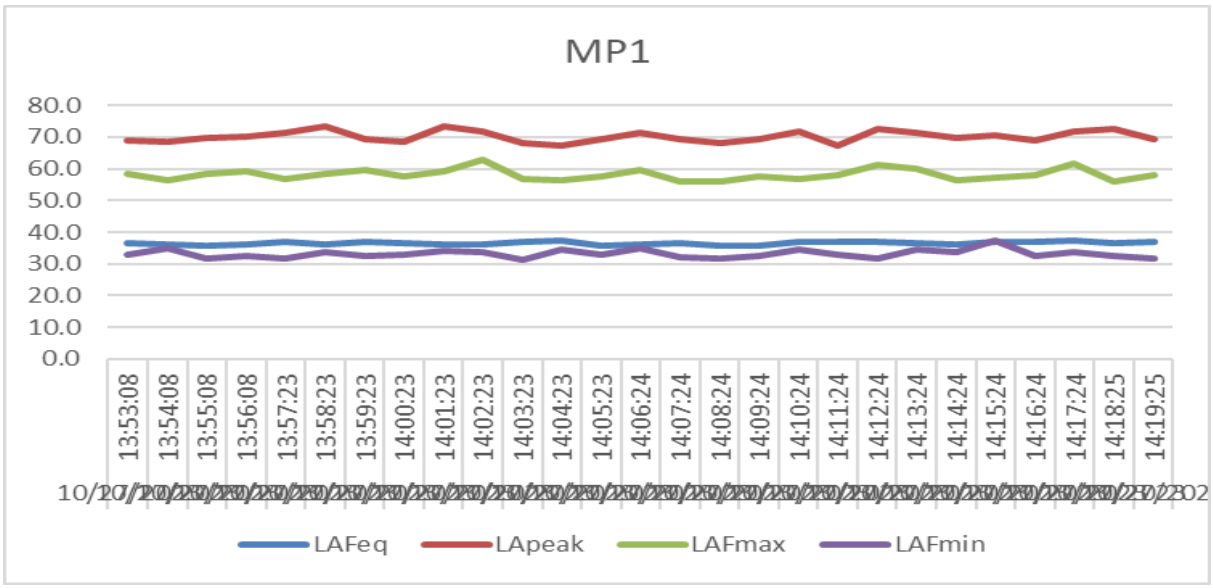
ID	Point Of Measurement	LAeq	LAmax	LAmin	LApeak	**Limits**
TAG 001	Tank Area	**36.5**	70.2	58.1	33.2	55dB
TAG 002	Center of the proposed project area	**35.7**	69.4	58.4	32.9	
TAG 003	Gate area	**36.8**	69.8	58.5	33.5	
TAG 004	Receptor point located outside the project area; point nearest to residual area	**36.4**	69.7	58.6	33.1	

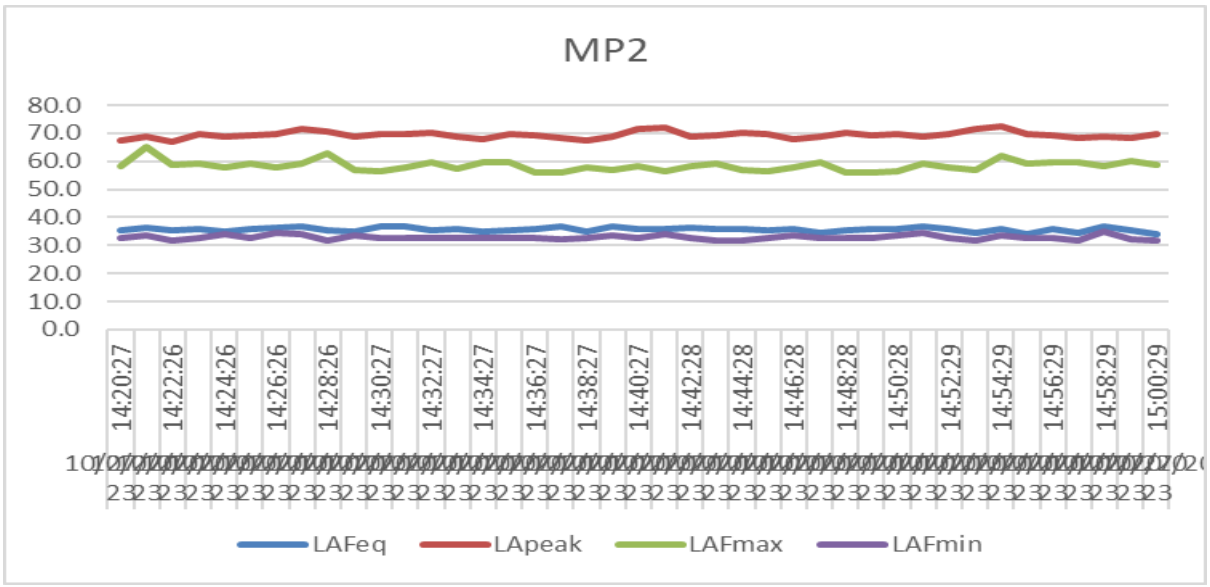
7.0 CONCLUSION

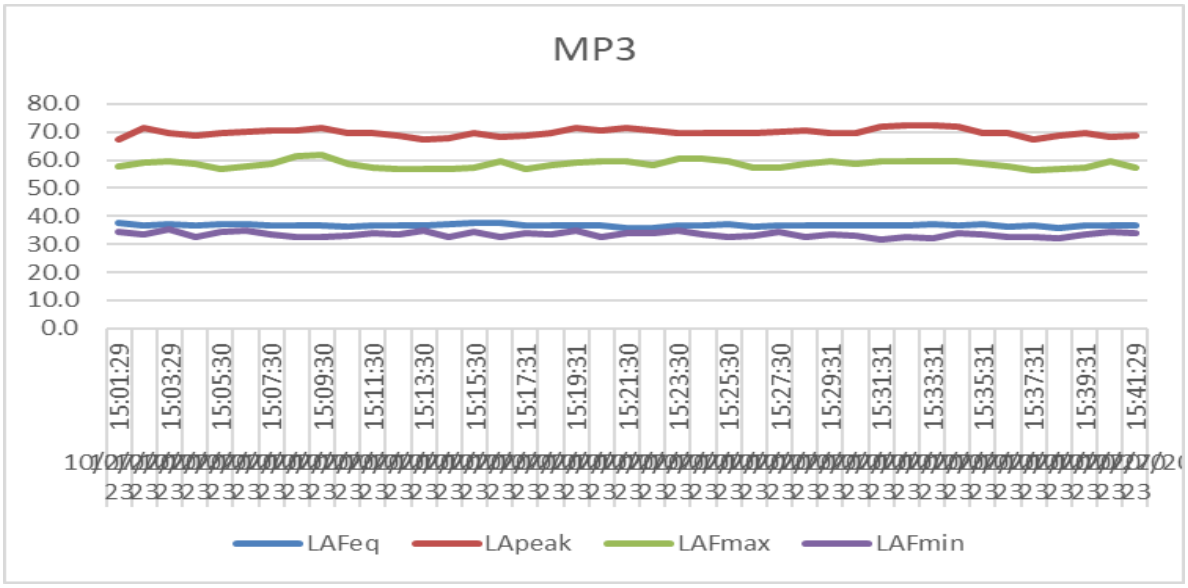
The noise environment at all monitoring locations were characterized with the main noise sources of reported levels being from the nearby road especially Mp1, MP3 and MP2, as well as moving vehicles coming in and out of the facility.

The **Diurnal noise** measurement results as shown in Table 5.1 indicate that the noise levels at all the monitoring points were within the IFC guideline limit of 70 dB (A). However, MP2 - the point adjacent to the road and MP5 - Point next the water tank diurnal noise levels obtained are however above the EMCA regulatory limits of 55 dB(A) for mixed residential and commercial areas. The other areas measured were within the EMCA regulatory limits of 55 dB(A) for the diurnal schedule. The main sources of reported levels can be attributed to the vehicular traffic on the adjacent road and project preparation activities.

7.1 GRAPHICAL PRESENTATION OF RESULTS



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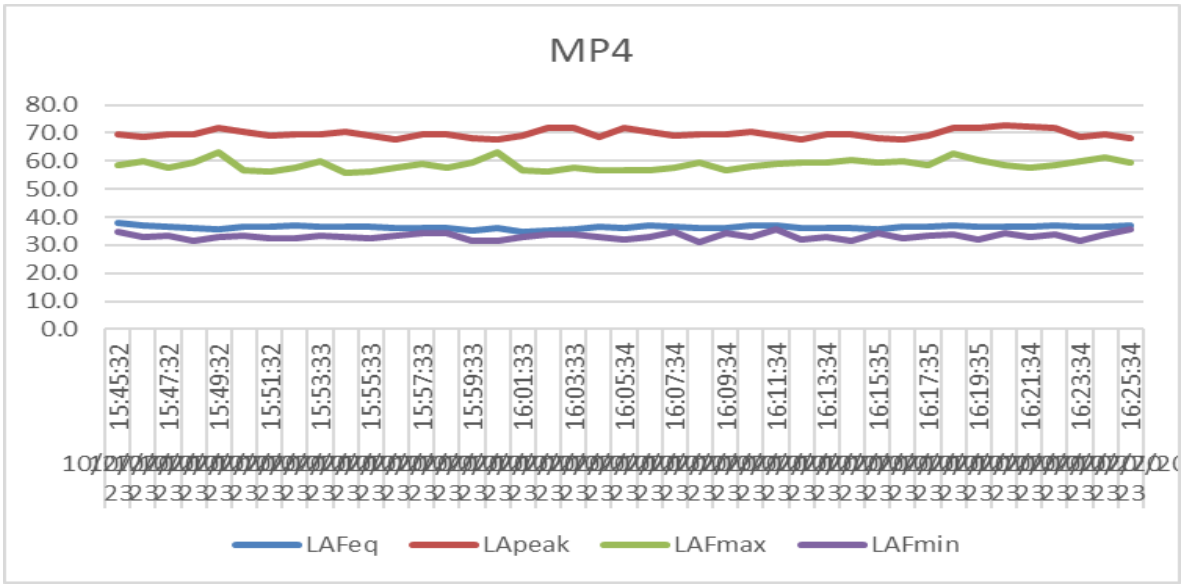
LAFmin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7.2 APPENDIX II: PHOTOGRAPHIC REPORT

Figure 1 MP1

Figure 2 MP2

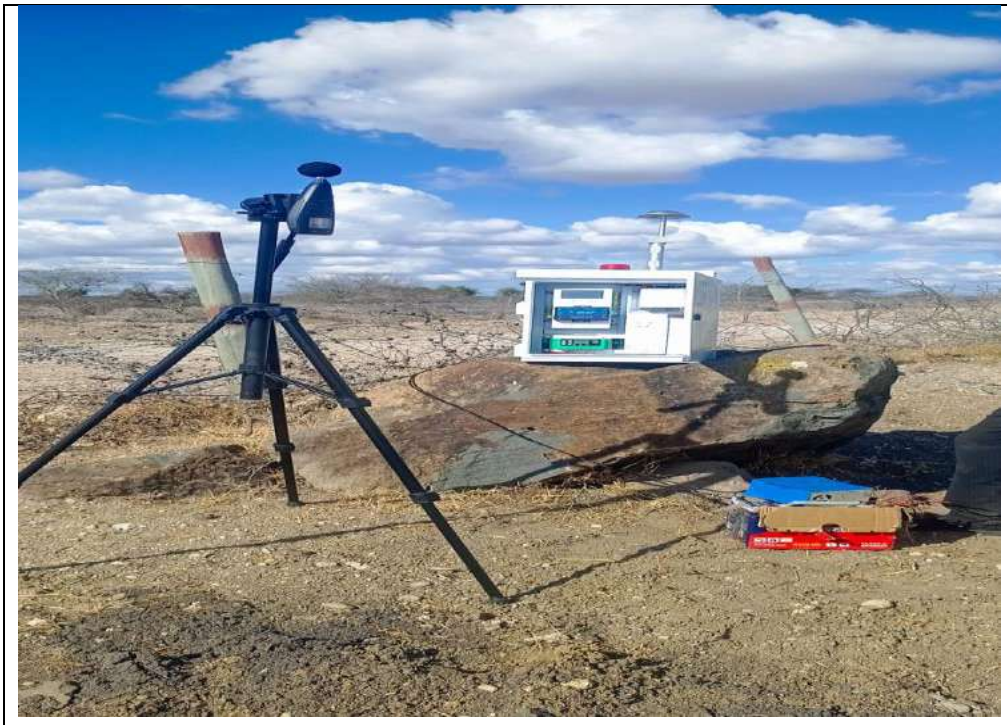

Figure 3 MP3

Figure 4 MP4

7.3 APPENDIX III: EQUIPMENT CALIBRATION CERTIFICATE

ORIGINAL

Kenya Bureau of Standards
P.O Box 54974–00200
NAIROBI
Tel:(+254 020) 6948000
info.metrology@kebs.org
Website: www.kebs.org

KEBS CALIBRATION MARK

Calibration Certificate

Page 1 of 10 Pages

BS/MET/19/15/3/9/87

REQUESTED BY:	LABWORKS E.A LTD
ADDRESS :	P.O BOX 6459-00100 NAIROBI
EQUIPMENT:	SOUND LEVEL METER
TYPE/MODEL :	LxT1
SERIAL NO. :	0004897
MANUFACTURER:	LARSON DAVIS
MICROPHONE TYPE:	PCB 377B02
MICROPHONE SERIAL NO.	168608
LABORATORY :	ACOUSTICS AND VIBRATION - NP 15
DATE :	2022-07-19
CERTIFICATE NO.:	BS/MET/19/15/3/9/87
STICKER SERIAL NO:	74925

1.0. STANDARDS AND REFERENCE EQUIPMENT USED

Pulse 3630 calibration platform consisting of;

- B&K controller module type 3560C S/No. 2522655
- Agilent 34970A Data acquisition switch unit S/No. MYA 44010494
- B&K Inline capacitor WA 0302A 12 pF S/No. 2499536
- Multifunction Acoustic Calibrator Type 4226 S/No. 2532059

2.0. METROLOGICAL TRACEABILITY

This calibration certificate documents traceability to the National Standards, which realize units of measurement according to the International System of Units (SI). KEBS is a signatory of the CIPM Mutual Recognition Arrangement (CIPM MRA).

3.0. CALIBRATION PROCEDURE

The Sound Level Meter was calibrated using Kenya Bureau of Standards Laboratory Procedure MET/15/CP/02: *Sound level meter calibration* and in accordance with the requirements of IEC60651 and IEC 60804.

Prepared By: **Collins Taiti** Date: **2022-07-20**

Checked By: Anderson Maina Date: 2022-07-21

Signed Date: 2022-07-22

For: Director Metrology and Testing

Date:16/10/2023

TO----------

Dear Sir/Madam/Prof./Dr./Hon./Rev.

REF: THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY TO BE HELD ON 24/10/2023 AT ENKIRGIRRI VILLAGE CHIEF'S OFFICE AT 10AM.

ABM Limited has commissioned a team of experts to undertake an Environmental and Social Impact Assessment (ESIA) study of the proposed limestone mining and processing into whiting in Kajiado County Enkirgirri location. In accordance with the Environmental Management and Co-Ordination Act of 1999[2015], it is mandatory that the proponent and the consultant collect the views of the interested parties and those likely to be affected by the proposed project. The objective of the public participation is to discern the pertinent environmental and social impacts that need to be mitigated in the entire life cycle of this project.

You have been identified to provide your views in your capacity as a key stakeholder and/or member of the public in relation to the proposed project. Your views shall be treated with outermost importance. To enable you submit your views, we have attached a semi-structured questionnaire. Thanks in advance for your corporation.

Yours respectfully,

Michael Ngugi

ESIA TEAM LEADER (NEMA Reg. No7268)

GEOFFREY NAIRI
ASSISTANT CHIEF
OLMERRUI SUB-LOCATION
Date:..... Sign.....

ATTENDANCE LIST FOR ABM PUBLIC PARTICIPATION FORUM
DATE 24TH OCTOBER 2023

NO.	NAME	ID NO.	TELEPHONE NO.	SIGNATURE
1.	THOMAS PARSUAI	32151658	0705513341	
2.	Benjamin Kariuki	31644191	0729954855	
3.	Daniel Kitoipei	33031147	0769722129	
4.	Kevin Moisasi	33527538	0742564877	
5.	Alex Mpuriah	23328035	0721-584067	
6.	Wilson Simintei	11680996	0720889932	
7.	BENJAMIN LANTEI	22279853	0721544603	
8.	DAVID KARIUKI	5364736	0725-507882	
9.	JOSHUA SOOMPEI	20180471	0727257180	
10.	Amos Lantei	0791670	0720881616	
11.	Thomas Kasio	22439792	0720091426	
12.	Erick Moisasi	31807895	0706318020	
13.	Nancy Simintei	32204573	0746035422	
14.	Joseph Parsuai	29735581	0727503696	
15.	Jeremiah Satiore	29284079	0797881797	
16.	DANIEL MERIA	27873165	0726961523	
17.	Justine Maloma	24162897	0725498367	
18.	Susan Simintei		0786615386	
19.	Charity Parmutia	24981753	0792564296	
20.	Catherine Ntujietio	27709819	0745838156	
21.	Evalyne Parmatyian	0790457108	0790457113	
22.	Evalyne Koipiaay	31058361 0718609076	0718609076	
23.	Sarah Opel	34060743	0706160967	
24.	Charity Kiparki	25637355	0113644467	
25.	ERIC SANOEOLE KUYA	11261399	0714672757	

26.	~~KIPITON SIMON~~	ID	TELEPHONE	Sign
27.	KIPITON SIMON	40754656	0746735181	
28.	Raphael Letika	40608090	0793288534	
29.	MEIKAN IPANJA	31017117	0796451001	
30.	Henry Kariuki	28564489	0790187718	
31.	JOSPHAT RIWCHO	24659639	0726125663	
32.	George Mbuvi	22685044	0721645099	
33.	Wycliffe Nonjai	29238302	0797768 61	
34.	DAVID Kilel	11681001	0716540721	
35.	Alexander Kimata	7795922	0726248297	
36.	Samuel parsaoti	38907147	0711263151	
37.	Josphat Lelelme	~~27406610~~ 23075023	0740610690	
38.	Amos Kariuki	24659642	0725994289	
39.	FAITH LASHANO	30435773	0743167075	
40.	Benjamin Langwe	6225614	0722-526776	
41.	MICHAEL NGUGI	23368949	0722 631747	
42.	GEOFFREY NARI	22439677	0703722193	
43.				
44.				
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53.				

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

The Proponent ABM Ltd has commissioned a team of experts to undertake an Environmental and Social Impact Assessment (ESIA) for the proposed projects. In accordance with the Environmental Management and Co-ordination Act, 1999 [2015], the proponent and the consultant are required to collect the views of the interested parties and those likely to be affected by the proposed project.

The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover - Vegetation cover shall suffer a great deal in the following ways:
  - Excavation of site of the plant.
  - Exposure of waste water to vegetation can cause a great damage.
  - Contaminated air by fumes can affect plants
- Water - Battery manufacturing has the most poisonous water waste. Exposure to ~~lead~~ lead is the primary health concern in battery manufacturing.
- Air
  - Inhaling of contaminated air by battery acid can cause respiratory damage. Lead-Acid batteries do emit very dangerous fumes.
  - lead dust
- Soil quality - Soil quality can be affected by polluted water coming into contact with the soil. ie Waste water from the plant.
  - lead dust can also affect soil quality.

b) Suggest preferred measures towards mitigating the said effects?

=> Battery safety training should be provided to the staff.
=> protective equipment should also be provided for those working in the factory.
=> The proper water treatment system should be put in place so that waste water doesn't get into the main stream.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

=> Yes, With the above effects on the environment, ~~the wider~~ ~~the ecosystem~~ element conflict will definately arise as a result of the impact on the above impact on the environment.

Respondent/ Participant

Name... ALEX MUSIA MUTENTE

Affiliate Institution... Community / immediate neighbour to the Plant.

Distance between you and the proposed project location... 500M

ID No... 23328057 Cell Phone No... 0721-884031 OR 0733-157774.

Date... 30TH, OCTOBER, 2023.

EIA Study Team Member

Signature & Official Stamp.....

Date... 6/11/2023

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

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The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover

None effective

- Water

effective

- Air

effective

- Soil quality

Less effective

b) Suggest preferred measures towards mitigating the said effects?

Avoid the release of harmfull gasses

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

Yes.

Respondent/ Participant

Name... MUTIATII EWE NGONGIA.....

Affiliate Institution.....

Distance between you and the proposed project location... Approximately 1 Km

ID No... 14473663 ..... Cell Phone No.... 0790 45 7103 .....

Date..... 01/11/2023 .....

EIA Study Team Member

Signature & Official Stamp.....

Date..... 6/11/2023 .....

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

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The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover — Bush clearing and cutting of tree
- Water — Use of chemicals may pollute water
- Air — Machines operation may cause sound pollution.
- Soil quality — Soil erosion due to clearing of bushes/trees.

b) Suggest preferred measures towards mitigating the said effects?

1. Pollution of water
2. Soil preservation.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

1. Planting of trees
2. Water protection.
3. Fencing of proposed site.

Respondent/ Participant

Name: PATRICIA KOBIKATUM

Affiliate Institution.....

Distance between you and the proposed project location... 400 m

ID No. 20701457 ~~844~~ Cell Phone No. 0720957118

Date: 26/10/2023

EIA Study Team Member

Signature & Official Stamp.....

Date: 6/11/2023

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

The Proponent ABM Ltd has commissioned a team of experts to undertake an Environmental and Social Impact Assessment (ESIA) for the proposed projects. In accordance with the Environmental Management and Co-ordination Act, 1999 [2015], the proponent and the consultant are required to collect the views of the interested parties and those likely to be affected by the proposed project.

The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover → kills Terrestrial wildlife
- Water → Marine Animals Such as Sea turtle, fish can mistake plastic waste for food and ingest it. → This can cause injury, illness,
- Air → Breaking down plastics can generate polluting microplastics that wind up in the air.
- Soil quality → Once the Company is Constructed this will lead to Soil erosion due to heavy machines to transport within the Company.

→ Additionary birds and other animals can become entangled in plastic waste leading to injury and fear.

b) Suggest preferred measures towards mitigating the said effects?

→ ~~Safety of~~ → Adhere the rule given by Nema

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

→ Yes. If they Lack of equality in Jobs Sharing.
→ If they dont adhere to the rules of the Sub County.

Respondent/ Participant

Name Erick Ntale Moisasi (plant operator of heavy machines)

Affiliate Institution Konza Techno City

Distance between you and the proposed project location 100 meters

ID No 31807895 Cell Phone No 0746786924

Date 30/10/2023

EIA Study Team Member

Signature & Official Stamp

Date 6/11/2023

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

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The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover
- Water
- Air
- Soil quality

1) air Pollution
2) Noise
1) - Seasonal river water may be contaminated.
1) - Air may be polluted if plastic is ~~Burnt~~
1) Soil quality may change if the water which is used is channeled to seasonal rivers.

b) Suggest preferred measures towards mitigating the said effects?

1) - Pollution should be minimal.
2) - To reduce Noise, Silencers should be used.
3) - Air Pollution should be minimised.
4) - Water which is used in the factory should be reused.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

NO

Respondent/ Participant

Name..ERIC SANOE OCE KUYA

Affiliate Institution..~~JOBLESS~~ N/A

Distance between you and the proposed project location..2KMS

ID No..11261399.....Cell Phone No..0714672757

Date..24/10/2023

EIA Study Team Member

Signature & Official Stamp.....

Date..6/11/2023

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

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The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover Since the trees will be cut down for more development of spaces, then the vegetations will be affected in one way or the other.
- Water – There shall be waste and sewarages and thus the water may be polluted.
- Air As the Company burns down the needed materials, the air will be polluted.
- Soil quality – Since there is dust and the soil will be affected.

b) Suggest preferred measures towards mitigating the said effects?

To ensure NO air pollution in the proposed project

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

NO

Respondent/ Participant

Name Mwaffa Mwasi

Affiliate Institution.....

Distance between you and the proposed project location 1500M

ID No. 29238302 Cell Phone No. 0719776861

Date 24th Oct. 2023

EIA Study Team Member

Signature & Official Stamp.....

Date 6/11/2023

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

The Proponent ABM Ltd has commissioned a team of experts to undertake an Environmental and Social Impact Assessment (ESIA) for the proposed projects. In accordance with the Environmental Management and Co-ordination Act, 1999 [2015], the proponent and the consultant are required to collect the views of the interested parties and those likely to be affected by the proposed project.

The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover
  Clearing of bushes and indigenous ~~trees~~ and soil.
- Water
  Water pollution by drugs / other waste materials
- Air
  Sound pollution by working machines.
- Soil quality
  May result ~~dut~~ due to bush clearing.

b) Suggest preferred measures towards mitigating the said effects?

(1) Trees be planted in plenty.
(2) Water be protected.
(3) Areas be fenced.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

- Water may be polluted by chemicals
- Soil quality ~~be~~ may be reduced through the clearing, and may be burning of bushes to create site for construction.

Respondent/ Participant

Name..Benjamin Lanyei.....

Affiliate Institution.....

Distance between you and the proposed project location...1KM.....

ID No..22279853.....Cell Phone No..0721544603.....

Date..26/10/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date..6/11/2023.....

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The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover
- Water
- Air
- Soil quality

b) Suggest preferred measures towards mitigating the said effects?

By Controlling air pollution

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements? No

Respondent/ Participant

Name....Thomas Lantei.....

Affiliate Institution....Air pollution.....

Distance between you and the proposed project location..2Km.....

ID No.....07916710.....Cell Phone No..0720881316.....

Date.....26/10/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date.....6/11/2023.....

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

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The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover – Clearing of vegetation which leads to aridity and desertification in area
- Water – water may be puluted by harmful substances used in the project and also waste product
- Air – Air may be polutee by harmful gases and substances refeased by the company and suspended in air that may lead acid rain
- Soil quality – The soil quality may lower and can lead to deficieny of soil Fertility which may lead to low productivity of land because of waste released by company

b) Suggest preferred measures towards mitigating the said effects?

- Gases should be treated to avoid pollution in air and destruction of ozono layer
- Trees should be planted in plenty to replace the ones cleare
- water released from the company should treated to avoid water pollution

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

- Soil Fertility may reduse due to disposal of harmful chemicals
- Gases may be suspended to the air which is harmful and may result to Formation of acidic rains
- Due to formation of acidic rain water is polluted and also contibute to low soil Fertility and hence low production of Land

Respondent/ Participant

Name....CHARITY SETOON KIPABKI.....

Affiliate Institution.....

Distance between you and the proposed project location.....2 Kilometers

ID No..25637335.....Cell Phone No....0111364467.....

Date..1/11/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date.....6/11/2023.....

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover

  It damage the mineral in the soil that helps the vegetable grow.
- Water

  It polute the water sources that can leads to danger disease that can affect human and animals lives
- Air

  It lead to air polution that can cause disease and dead.
- Soil quality

  It reduces the quality that helps the soil to be fortile for plant to grow.

b) Suggest preferred measures towards mitigating the said effects?

To search for a better project that cannot affect human and environment for a better living.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

Respondent/ Participant

Name. KIPITON RIANTOT

Affiliate Institution.....

Distance between you and the proposed project location. 40 m

ID No. 40754656 Cell Phone No. 0746735181

Date. 1/11/2023

EIA Study Team Member

Signature & Official Stamp.....

Date. 6/11/2023

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover – Falling of trees to pave way for development will bring down the indigenious trees in the affected areas.
- Water – Waste water means pollution of the ecosystem in the areas, water used for domistic and livestocks will be no more due to pollution.
- Air → We use to breath in fresh air, due to recycling of plastics, there will be polluted air.
- Soil quality → Soil formation will be greatly affected due to the proposed construction.

Dust is expected due to tracks and Motorvehicle movement.

b) Suggest preferred measures towards mitigating the said effects?

- Re-planting of trees to replace the fallen.
- Soak pits and water recycling to prevent from getting into seasonal rever.
- Both air and soil surveys be done prior & after.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

- Sound pollution due to the operating machines,
- Being a wild-life corridor, the movement of wild animals to Amboseli from the Nairobi National park will be greatly affected negatively,
- Unfriendly emmissions into the air will change the fresh air used by both human beings and animals & birds.

Respondent/ Participant

Name..George K. Mbusa.....

Affiliate Institution.....

Distance between you and the proposed project location..500M.....

ID No..22455664.....Cell Phone No..0721 645 093

Date..26/10/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date..6/11/2023.....

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover
- Water ⇒ Contamination of water by use of chemicals
- Air ⇒ Use of chemicals which will polute the environment
- Soil quality ⇒ Use of heavy commercial machines which will change the soil quality.

b) Suggest preferred measures towards mitigating the said effects?

i) Proper use of vegetation cover
ii) Proper storage of waste products
iii) Maintaining the soil quality.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

(i) Yes
i) Sound polution
ii) air polution
iii) Waste materials

Respondent/ Participant

Name.....JOSEPH MALWA.....

Affiliate Institution.....

Distance between you and the proposed project location.....1 Km.....

ID No.29735581.....Cell Phone No....0727503696...

Date.....29/10/03.....

EIA Study Team Member

Signature & Official Stamp.....

Date.....6/11/2023.....

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover (a) disturbance or damage to existing vegetation. (b) loss of a certain species or an increase of the growth of other's
- Water → (a) potential for changes in surface water flows, such as increase runoff or reduced ground water recharge. (b) quality of surface water → increase sedimentation or chemical contamination.
- Air →
- Soil quality → The proposed project could have several impacts on the soil quality in the area, first there is a potential for a loss of topsoil due to wind and water erosion (b) Potential for changes in the PH of the soil (c) changes in the composition of soil such as an increase in the salinity or a decrease in organic matter

b) Suggest preferred measures towards mitigating the said effects?

There are few measures that could be taken to mitigate the effect of vegetation, water, air and soil quality.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

It is true. recycling plants can have some conflicts with the wider ecosystem. E.X recycling facilities can produce significant amounts of noise and traffic. which can disrupt nearby community. They can also generate waste products that can pollute the air and water, and they can contribute to soil erosion. In additionally the transportation of materials to and from the facility can creats additional emissions and traffic congestion.

Respondent/ Participant

Name..Meikan Ipanja.....

Affiliate Institution.....

Distance between you and the proposed project location..1 K.M.....

ID No..31017117.....Cell Phone No..0796451001.....

Date..29/10/23.....

EIA Study Team Member

Signature & Official Stamp.....

Date..6/11/2023.....

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover – Clearing of vegetation which leads to aridity and desertification in the area
- Water – Water may be polluted by harmful chemicals used in the project and also waste products
- Air – Gases may be suspended to the atmosphere which may lead to formation of acidic rains and destruction of ozone layer.
- Soil quality – The soil quality may lower and can lead to deficiency of soil fertility. which may lead to low productivity of land.

b) Suggest preferred measures towards mitigating the said effects?

– Water from the Company should be treated to avoid water pollution.
– Gases should be treated to avoid pollution in air and destruction of ozone layer.
– Trees should be planted in plenty to replace the cleared ones while setting up the Company

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

– Soil fertility may reduce due to disposal of harmful chemicals.
– Gases may be suspended to the air which is harmful and may result to formation of acidic rains
– Due to formation of acidic rains, water is polluted and also contribute to low soil fertility and hence low productivity of the land.

Respondent/ Participant

Name... EVERLYN ..... S ..... KOIPITAT .....

Affiliate Institution.....

Distance between you and the proposed project location..... 1M .....

ID No... 31058361 ..... Cell Phone No... 0715484539 .....

Date.... 26/10/2023 .....

EIA Study Team Member

Signature & Official Stamp..... .....

Date..... 6/11/2023 .....

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The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover – Vegetation may be cleared leading to desertification
- Water – pollution of water by chemicals and by waste products
- Air – Gases may be released to the atmosphere leading to air pollution.
- Soil quality – Soil quality may reduce due to disposal of harmful substances.

b) Suggest preferred measures towards mitigating the said effects?

- Water from the Company should be treated to avoid polluting water sources
- Gases which are harmfull should not be released to the atmosphere
- Trees should be planted to replace the cleared ones.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

- Gases may be released to the atmosphere which may lead to formation of acidic rains.
- Due to formation of acidic rains, soil fertility may lower and water sources polluted
- Desertification and aridity may occur due to clearance of bushes and tree

Respondent/ Participant

Name..Charity N Parmuria.....

Affiliate Institution.....

Distance between you and the proposed project location....1 M.....

ID No.24987753.....Cell Phone No.0792 564296.....

Date.....26/10/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date.....6/11/2023.....

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover
  - No effect
- Water
  - the Project should seek a good drainage system
- Air
  - Seek alternative to avoid air pollution (smoke)
- Soil quality
  - No effect to the nearby Community

b) Suggest preferred measures towards mitigating the said effects?

- All kind of pollution do be Controlled

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

- None

Respondent/ Participant

Name.....JULIUS ~~LETUYIES~~ K. LETUYIES.....

Affiliate Institution.....

Distance between you and the proposed project location.....800M.....

ID No..22489398.....Cell Phone No..0745624929...

Date..29/OCT/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date.....6/11/2023.....

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover – Bushes clearing and destruction of vegetation cover
- Water – Pollution of water by chemicals may likely be done.
- Air – ~~Air~~ pollution ~~of~~ caused by found from working aparatus.
- Soil quality
  Soil may be affected when trees (indigenous) are destroyed.

b) Suggest preferred measures towards mitigating the said effects?

1. The affected areas should be fenced.
2. Water protection ie season rivers be protected from pollution.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

(1) Water pollution.
(2) Soil may affected through cutting of trees.
(3) Sound pollution from working aparatus.

Respondent/ Participant

Name... Justine Hashiper.....

Affiliate Institution.....

Distance between you and the proposed project location... 3 km.....

ID No.. 24462297.....Celi Phone No. 0725 498 367.....

Date..... 26/10/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date..... 6/11/2023.....

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover — Clearing of bushes.
- Water — Water pollution.
- Air — Sound pollution.
- Soil quality — Sound soil erosion and Clearing of bushes.

b) Suggest preferred measures towards mitigating the said effects?

— Pollution of Water.
— Preservation of Water.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

1. Planting of trees.
2. Water protection.
3. Fencing of proposed site.

Respondent/ Participant

Name..BENJAMIN APURETI KARIUKI.....

Affiliate Institution.....

Distance between you and the proposed project location..1 M.....

ID No.31644191.....Cell Phone No..0729954855.....

Date.....26/10/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date.....6/11/2023.....

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover
  None effective
- Water
  effective
- Air
  effective
- Soil quality
  Less effective.

b) Suggest preferred measures towards mitigating the said effects?
Avoid the release of harmful gases.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?
Yes.

Respondent/ Participant

Name. Catherine Ntijle710

Affiliate Institution.....

Distance between you and the proposed project location.....1 km.....

ID No. 27709818 .....Cell Phone No. 0745838156

Date. 1/11/2023

EIA Study Team Member

Signature & Official Stamp.....

Date..... 6/11/2023

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover – May be affected through cutting of trees for site preparation
- Water – No seasonal rivers may be polluted
- Air – Sound pollution by working machine
- Soil quality – ~~No~~ affected by the vegetation covers ~~not affected~~ interfered.

b) Suggest preferred measures towards mitigating the said effects?

1. Planting of trees.
2. Sound pollution must be reduced.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

1. Water pollution – should be protected.
2. Soil affection – planting of trees.
3. Air pollution – sound must be limited.

Respondent/ Participant

Name.....CICILIA N. KANTEI.....

Affiliate Institution.....

Distance between you and the proposed project location.....Only 1 Km.....

ID No.....36[illegible]852.....Cell Phone No.....0707 800 463.....

Date.....26/10/2023.....

EIA Study Team Member

Signature & Official Stamp.....

Date.....6/11/2023.....

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover
- Water
- Air ✓
- Soil quality

b) Suggest preferred measures towards mitigating the said effects?

Follow Scientific measures to Curb the same.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

Respondent/ Participant

Name..... Alexander Kimata.

Affiliate Institution..... Enkargumi Primary.

Distance between you and the proposed project location..... 1 Kilometre.

ID No..... 7795922 ..... Cell Phone No..... 0726278297

Date..... 01/11/23 .....

HEADTEACHER
ENKIRGIRRI DAY AND BOARDING PRY SCHOOL
P. O. Box 282-01100, KAJIADO
Date..... Sign.....

EIA Study Team Member

Signature & Official Stamp.....

Date..... 6/12/2023 .....

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover – Clearing of vegetation which leads to Aridity and desertification in the area.
- Water – Water May be polluted by harmful substances used in the project and also waste products.
- Air – Air May be polluted by harmful gases and substances released by the Company and suspended in air that may lead to acid rain
- Soil quality – The soil quality May lower and can lead to deficiency of soil fertility which may lead to low productivity of land, because of waste released by the Company.

b) Suggest preferred measures towards mitigating the said effects?

- Gases should be treated to avoid pollution in air and destruction of ozone layer
- Trees should be planted in plenty to replace the ones cleared while setting up the Company.
- Water released from the Company should be treated to avoid water pollution.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

- Soil fertility May reduce due to disposal of harmful chemicals
- Gases May be suspended to the air which is harmful and May result to formation of acidic rains
- Due to formation of acidic rains, water is polluted and also contribute to low soil fertility and hence low production of land.

Respondent/ Participant

Name... AMOS K KARIUKI

Affiliate Institution.....

Distance between you and the proposed project location... 1M

ID No. 24659642 ..... Cell Phone No... 0725 99 5239

Date... 26/10/2023.

EIA Study Team Member

Signature & Official Stamp...

Date... 6/11/2023

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PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover
- Water → Marine animals can mistake plastic for food
- Air → persistent Organic pollutants
- Soil quality → It change the physical structure of the land undergoes and limits it's capacity to hold water.

b) Suggest preferred measures towards mitigating the said effects?

Increase Regulation of Sigle-use plastics is needed.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

→ Job sharing.
→ Lack of Transparency.
→ Cheap Labour

Respondent/ Participant

Name..... Nancy Simitei .....

Affiliate Institution..... Nil .....

Distance between you and the proposed project location..... 500 metres .....

ID No..... 36705834 .....Cell Phone No..... 0746035422 .....

Date..... 02/10/2023 .....

EIA Study Team Member

Signature & Official Stamp..... .....

Date..... 6/11/2023 .....

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

The Proponent ABM Ltd has commissioned a team of experts to undertake an Environmental and Social Impact Assessment (ESIA) for the proposed projects. In accordance with the Environmental Management and Co-ordination Act, 1999 [2015], the proponent and the consultant are required to collect the views of the interested parties and those likely to be affected by the proposed project.

The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover -Vegetation cover shall suffer in th following way excavation in the site.
- Water -Battery manufacturer has the most poisonous water waste.
- Air -Inhaling of contaminated air by Battery acid can cause damages.
- Soil quality -lead dust can also affect soil quality.

b) Suggest preferred measures towards mitigating the said effects?

-protective Equipment should also be provided for those working in the factory.

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

-yes with the above effects on the enviroment as result of the impact on the above.

Respondent/ Participant

Name. KEFA SIMIYU KASIO

Affiliate Institution.....

Distance between you and the proposed project location... 400 m

ID No. 0790 438 H ..... Cell Phone No. 0790 816 803

Date.... 01/11/2023

EIA Study Team Member

Signature & Official Stamp.....

Date..... 6/11/2023

THIS IS A PUBLIC PARTICIPATION AND CONSULTATION ON THE PROPOSED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR ABM LIMITED FOR RECYCLING PLASTIC AND MANUFACTURE OF BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, STAFF RESIDENTIAL HOUSES, DRILLING OF BOREHOLE AND FENCING WITHIN A BLOCK OF LAND REFERENCE NUMBERS K AJIADO KAPUTEIEI NORTH/33878 ISINYA SUB COUNTY, ENKIRGIRRI VILLAGE, KAJIADO COUNTY

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The objective of this undertaking is to determine pertinent environmental and social impacts that need to be addressed in the entire life cycle of the proposed project. To this end, we look forward to enlisting your cooperation and most sincere views.

PART ONE

a) What environmental impacts do you anticipate from the proposed projects?

- Vegetation cover → ~~Dust~~, Dust impacts
- Water → microplastics
- Air → Toxic Chemicals
- Soil quality → can affect plants by reducing root growth and ~~nate~~ nutrients uptake.

b) Suggest preferred measures towards mitigating the said effects?

→ Refill systems to be introduce

c) Are there any forms of conflicts that are likely to result from the recycling plant and its operation of the proposed facilities with the wider ecosystem elements?

→ poor management.
→ Abuse of rules and regulation given by Nems.
→ Introducing of new forms and plans that are not said before.

Respondent/ Participant

Name... JOHNSTAN IPANJA LANTEI

Affiliate Institution.....

Distance between you and the proposed project location... 800 M

ID No. 6117432 ..... Cell Phone No. 0710 645369

Date... 29/10/2023

EIA Study Team Member

Signature & Official Stamp.....

Date... 6/11/2023

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Telcom Wireless: 020-2183718, 020-2101370
Mobile Line: 0724 253 398, 0723 363 010, 0735 013 046
Incident Line: 0786 101 100, 0741 101 100

P.O. Box 67839 - 00200
Popo Road, Nairobi, Kenya
Email: dgnema@nema.go.ke
Website: www.nema.go.ke

NEMA/TOR/5/2/631

29th September, 2023

Managing Director
Associated Battery Manufacturers (East Africa) Limited
P.O. Box 48917-00100,
NAIROBI

RE: TERMS OF REFERENCE (TOR) FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY REPORT FOR THE PROPOSED PLASTIC RECYCLYNG AND MANUFACTURE OF PLASTIC BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATIVE BLOCK, BOREHOLE, WATER STORAGE DAM, STAFF HOUSES AND FENCING) IN KAJIADO COUNTY PLOT NO. KJD/KAPUTEI NORTH/33878, KAJIADO COUNTY.

We acknowledge the receipt of your TOR for the above subject.

Pursuant to the Environmental Management and Coordination Act, 1999, the Environmental (Impact Assessment and Audit) Regulations 2003 and Legal notice 31 & 32 of 2019, your terms of reference for the Environmental Impact Assessment (EIA) for the **PROPOSED PLASTIC RECYCLYNG AND MANUFACTURE OF PLASTIC BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATIVE BLOCK, BOREHOLE, WATER STORAGE DAM, STAFF HOUSES AND FENCING) PLOT NO. KJD/KAPUTEI NORTH/33878 IN KAJIADO COUNTY** has been approved with the following requirements:

Undertake a comprehensive environmental baseline information on soil and air quality to form baseline levels for compliance monitoring of Lead residue pollution, Climate Change risk and vulnerability assessment and a detailed review and compliance plan to the Climate Change Act 2016 to be included in the EIA report.

You shall submit ten (10) copies of the study report, upon payment of the applicable EIA processing and monitoring fees being 0.1% of the total project cost, a soft copy of the summarised ESMP in **WORD** format for preparation of public notice and one electronic copy of the report prepared by the team of experts to the Authority.

Thank you for your willingness to comply.

JOSEPH MAKAU
FOR: DIRECTOR GENERAL

PROPOSED RECYCLING PLANT OF BATTERY CASING MEETING

WITH ENKIRGIRRI VILLAGE COMMUNITY/STAKEHOLDERS PUBLIC MEETING 24TH /10/2023.

- Opened with a word of prayer and brief sermon by Rev. D. Kileu.
- The villagers chair (pst. Amos Kinyokie) chaired the meeting and introduced the committee he works with.
- The area Ass. Chief took over to introduce the other stake holders (The school, hospital, community, ABM staff and NEMA consultants).

INTRODUCTION OF ABM & NEMA STAFF:

1. Michael Ngugi (ENVIRONMENTAL CONSULTANT)
2. Michael Wanjala (ABM)
3. Benjamin Lankwen (environmental consultant)
4. Thomas Mbugua (ABM Association manufacturer ltd.).

PRESENTATION BY THOMAS MBUGUA (ABM STAFF)

- Talked of the recycling of casing used and bringing it back into used.
- The cases shall be recycled here and taken back to the main Co. for refilling (cells & acids)

THOMAS MBUGUA- ABM. BENEFIT ENTAILS

- Road maintenance.
- Employment to community assurance.
- Water to community.

REPRESENTATION BY BENJAMIN LANGWEN (NEMA CONSULTANT).

- He is a pollution expert on environment.
- Expected pollutions impacts:
  - Dust –air (baseline needed to assess the impacts)
  - Soil
  - Sound pollution (baseline survey will come to do the survey for assurance)

JOB OPPORTUNITIES

- White collar jobs
- Casual/ manual jobs
- Jobs be given to community first

- Water be served to the community first and watering points for livestock.

MICHEAL NGUGI (NEMA CONSULTANT)

- Working 8.am to 5. Pm to prevent noise pollution.
- Pouring water to mitigate dust pollution.
- Maximum care of environment must be adhered to prevent destruction of the environment be it air, vegetation, living things and the entire community.
- The Company= should plant trees to replace the indigenous destroyed during construction and help to prevent dust pollution.

REACTIONS FROM THE COMMUNITY

Chief- Is the boiler air tight?

- What percentage of emission is controlled?
- Is the business opportunity given to the community? (kiosk, contractors &
- Materials supply)
- Where is the used water (cooling of machines/ boiler) directed to after use?

1. Alex Mpusia- Notice period elapsed on a change of user.
   - Short notice on EIASS.(public participation)
2. Kelvin Moisasi-How are the casing (used) be brought to the industry?
3. Joseph Malei- change of user notice was not visible
   - Benefits of the industry to the community
   - How is sound pollution controlled?
   - Job opportunities be guaranteed
4. Alex Kimanta- morals maintenance of the community.
5. Daniel Karioki- community was not well informed hence the number to propose is low
6. Benjamin Lantei- Will the pollution reports be available to us?
7. Wilson Simintei- Gender balance on employment.

NEMA CONSULTANT QUESTION / ANSWERS:

HOW IS THE SMOKE/ EMMISSIONS CONTROLLABLE?

- The process uses the extruder (instead of cooler). Hence no emissions.
- They are under enclosed box.
- Cooling systems is a round thing hence water is not released out, (recirculation water)
- ***Noise pollution;*** an expert will be there soon to survey on noise levels currently and after the industry has begun.
- ***Morality;*** The co. to adhere to its code of conduct strictly.
- No waste water (effluent) in this industry.
- On matters community attendance being low- The expert emphasized that being the beginning of the process it's not low and questionnaires are given out for more recommendations and be brought back afterwards.
- ***CSR***- be on affordability and doable on priorities.
- A baseline report on pollution is a public document hence will be accessible to all.
- Consideration on interns be addressed well with the co.

The meeting ended at 2pm and closing prayers by Mama Amos

APPROVED BY:

NAME: GEOFFREY R. NAIRI

DATE 25/10/2023

SIGNATURE/STAMP

GEOFFREY NAIRI
ASSISTANT CHIEF
OLMERRUI SUB-LOCATION
Date: [redacted] Sign

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/18821

Application Reference No: NEMA/EIA/EL/24812

M/S **JACOB AKINALA**
(individual or firm) of address
P.O. Box 1477 - 00200 NAIROBI

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert General**

registration number **0729**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/2/2023** Expiry Date: **12/31/2023**

Signature...

(Seal)
Director General
The National Environment Management Authority

FOR USE ON ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT FOR PROPOSED PLASTIC MANUFACTURE OF PLASTIC BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, BORE HOLE, WATER TOWER, D.M. STAFF HOUSES AND FENCING) IN KAJIADO COUNTY PLOT NO KJD/KAPUTEI NORTH/33878

P.T.O.

FORM 7 (r.15(2))

nema
mazingira yetu | uhai wetu | wajibu wetu

FOR USE ON ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT FOR PROPOSED PLASTIC BATTERY CASING SOCIAL MANUFACTURE OF PLASTIC BATTERY CASING AND ESTABLISHMENT OF ASSOCIATED STRUCTURES (ADMINISTRATION BLOCK, BORE HOLE, WATER SOURCE, DAM, STAFF HOUSES AND FENCING) IN KAJIADO COUNTY PLOT NO KID/KAPUTEI NORTH/3878

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/18326

Application Reference No: NEMA/EIA/EL/24024

M/S **MICHAEL M. NGUGI**
(individual or firm) of address
P.O. Box 1317 - 00208 Ngong Hills

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert General**

registration number **7268**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **12/30/2022**

Expiry Date: **12/31/2023**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001: 2015 Certified