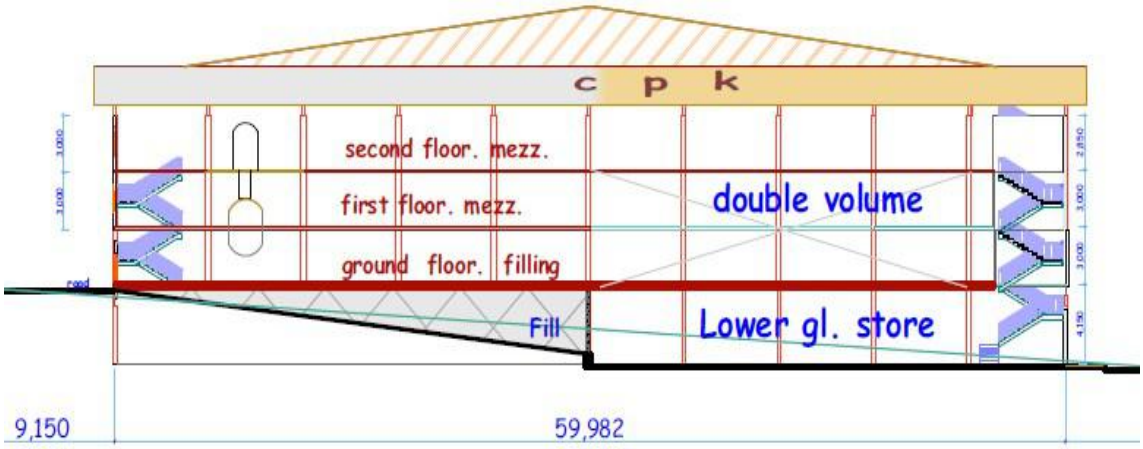
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR GODOWNS FOR PROPOSED EMULSION PAINT BINDER FACTORY AND PLASTIC INJECTION MOULDING PLANT ON L.R. NOS.12648/179 AND 12648/180 SITUATED IN LUKENYA AREA, KINANIE SUB-LOCATION, KINANIE LOCATION, KINANIE DIVISON, ATHI RIVER SUB-COUNTY, MACHAKOS COUNTY

GPS coordinates: Latitude 1°28'27.6" South, Longitude37°03' 02.7" East



PROPONENT

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DECEMBER, 2025

CERTIFICATION

This ESIA study report has been prepared in accordance with the Environmental Management and Coordination Act Cap 387 and the Environmental (Impact Assessment and Audit) Regulations 2003 for submission to the National Environment Management Authority (NEMA). We the team of ESIA Experts and the proponent certify that the particulars given in this report are correct to the best of our knowledge.

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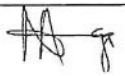
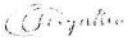
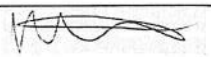
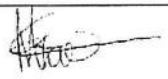
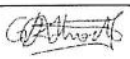
Munyua A. Mwenga	
Otiato Wafula	
Martin Mamboleo	
Casty Mbae	
Mohammed Faisal	
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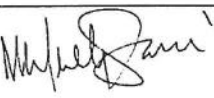
Crown Paints Kenya PLC Limited P.O Box 78848 - 00507 Nairobi	 Date: 28/12/2025

NON–TECHNICAL SUMMARY

This ESIA study report documents the findings of an environmental and social impact study for Godowns for the proposed Emulsion Paint Binder Factory and Plastic Injection Moulding Plant on L.R. Nos.12648/179 & 12648/180 situated in Lukenya Area, Kinanie Sub-Location, Kinanie Location, Kinanie Divison, Athi River Sub-County, Machakos County.

The proposed project site (L.R. Nos.12648/179 & 12648/180) is owned by Crown Paints Kenya PLC Limited. The two plots measure approximately 4.004 HA (9.89 Acres).

The proposed project site is designated for industrial use.

Crown Paints Kenya PLC Limited, manufactures about 80% of its paint products that are based on Emulsion Binder (generally called water-based paints). Most of the raw materials for paint manufacturing including Emulsion Binder are imported, Emulsion Binder being one of the largest in volumes. Currently, Crown Paints Kenya PLC - a top importer brings to the country almost 600 to 700 Metric tonnes of Emulsion Binder every month, approximately 50% of the imported Emulsion Binder is water. Accordingly, instead of importing the Emulsion Binder, Crown Paints Kenya PLC Limited is proposing to construct an Emulsion Binder Factory in Lukenya.

Also, currently, Crown Paints Kenya PLC Limited sources plastic buckets for packaging of its paints from different plastic buckets manufacturers locally. This leads to different dimensions and designs of the plastic buckets. To address this challenge, Crown Paints Kenya PLC Limited is desirous of constructing a modern state of the art Plastic Injection Moulding Plant at Lukenya.

The proposed development will comprise two main blocks: one block to house the Emulsion Binder factory and the other block to house the Plastic Injection Moulding Plant. In total the two blocks will cover an area of approximately 6 600 square metres (sm). Details of the main components of the proposed development are summarised below:

i) Emulsion Paint Binder factory block:
   a) Ground floor – 2400 sm
   b) Mezzanine 1 & 2 – 1200 sm

ii) Plastic Injection Moulding Plant block
   a) Ground floor – 2400 sm
   b) Mezzanine 1 & 2 – 600 sm

iii) Green areas 10% of site area – 4000 sm and

iv) Parking and circulation paved area – 8000 sm

The substructures for the two blocks will be made of reinforced concrete foundations and structural steel columns and beams, while superstructures (the buildings envelope and roof) will be structural steel frame clad with galvanized pre-painted sheeting interspaced with polycarbonate lighting sheets. The ground floors will be reinforced concrete slab.

The upper mezzanine floors will have floors made of steel chequered plate on steel beams and columns. Each block will have lateral dimension of 54 x54 meters. Internally, each block will have two sections

separated by a 6m wide firebreak. One side will have mezzanine floor and other will have a double volume storage space of 9m high.

The project area has an average of 4 to 6 peak sunlight hours daily, this is an ideal location for Solar Photovoltaic (PV) systems, which offer significant environmental benefits compared to fossil fuel sources, towards this end, the project proponent is proposing to install two (2) Solar Photovoltaic (PV) systems. The two (2) Solar Photovoltaic (PV) systems will generate green energy for the proposed facility. The systems will offer the primary power sources with other sources like KPLC authority power source and LPG Fired Generator being the back-up power sources.

The design will allow for mix of Grid-tie system to cover the production line and one central hybrid system to cover the general load like security, office administration, ICT services, and forklift charging services as well as plant controls.

Both system will be designed to be a modular system to allow future growth, with hybrid system only system that will have battery back system.

The system will have the following components:

i. One Central Hybrid system: this will be a 100kW system - the system will have 216 number 615w solar modular panels - the system will be coupled with 40kWH battery storage.
ii. Line production 1: it will be a Grid-tie system and it will be a rated 400kW system - the system will have 960 number 615w solar modular panels - the system will not have storage.
iii. Line production 2: it will be a Grid-tie system and it will be a rated 400kW system - the system will have 960 number 615w solar modular panels. The system will not have storage.

The proposed project has potential to generate positive and adverse impacts. The key environmental and social concerns and proposed mitigation measures are summarised below:

Table 1: Summary of anticipated impacts & proposed mitigation measures

Anticipated Impacts	**Mitigation Measures**
Climate change and Green House Gases generation	1. Use LPG fired generators 2. Electric vehicles and machinery will be used 3. Install Solar Photovoltaic System 4. Plant and maintain a greenbelt around the facility
Light Pollution	5. No direct light sources will be visible from the exterior of the buildings to minimize light pollution which can affect wildlife from nearby conservancies
Safety & integrity of buildings	6. Comply with the National Construction Authority Act, No. 41 of 2011 7. Use of appropriate construction materials and reinforcements as per specifications 8. Close supervision of construction works 9. Proper supervision & material testing regime
Increased traffic flow & road safety concerns	10. Implement recommendations of the traffic management plan 11. Erect appropriate road safety signage 12. Deploying adequate number of traffic marshals

Anticipated Impacts	Mitigation Measures
	13. Provide adequate parking spaces within the project site 14. Provide incentives for facility users to prioritise public and non-motorised transport modes
Noise pollution & excessive vibration	15. Comply with EMCA Noise Pollution & Excessive Vibration Regulations, 2009 16. Carryout regular monitoring of noise levels during construction phase 17. Construction work to be confined to between 8am to 5pm 18. All workers shall be trained and provided with PPEs such as helmets, earmuffs, and dust mask. which will always be used when operating within the site area 19. Safety signage shall be erected at the construction site entrance to notify of the construction activities and timings
Air pollution, particulate matter & dust emission	20. Cover all trucks hauling soil, sand and other loose materials 21. Avoid open air burning of waste such as paper and plastic containers at the construction site 22. Onsite dirt piles or other stockpiled material should be covered, wind breaks installed, water and/or soil stabilizers employed to reduce wind-blown dust emissions 23. All workers at the construction site and visitors exposed to dusty conditions must be provided with dust masks and other PPEs 24. Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases 25. Institute appropriate dust suppression measures such as regular sprinkling of water on dusty access roads; speed limits; etc.
Occupational Safety & Health	26. Register the construction site with Department of Occupational Safety and Health Services (DOSHS) 27. Comply with applicable Labour Laws such as the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007, etc 28. Staff awareness creation on safety and health issues 29. Have trained First Aiders and fully equipped First Aid box on site 30. Provision & ensure proper use of personal protective equipment i.e. safety boots, helmet, goggles, and hand gloves
Public Safety & Health	31. Enhancement of pedestrian infrastructure along Pope road & access points 32. Enforce speed limits for trucks & vehicles delivering construction materials 33. Proper signage and warning to public of heavy vehicle turning 34. The contractor to abide by ESIA licensing conditions
Solid waste generation	35. Dump of excavated materials to sites approved by NEMA and the county government 36. Comply with EMCA Waste Management Regulations 2006 37. Provision for waste receptacles / bins at strategic places within the site 38. Provision of bins to handle biomedical waste 39. Segregation of waste at the source during the project cycle 40. Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options: source reduction, recycling, composting and reuse, will facilitate waste handling during operation/occupation phase

Anticipated Impacts	Mitigation Measures
Sewerage & wastewater management	41. Use onsite wastewater treatment plant 42. Comply with EMCA Water Quality Regulations, 2006 43. For waste management prevent the contamination of surface or subsurface water 44. Servicing of machinery & equipment to be done at a designated places with a paved surface and oil interceptors
Increased water demand & consumption	45. Undertake a water needs analysis for the project 46. Connect the site to municipal water supply 47. Set up water reservoirs to buffer against erratic supplies & reduce competition for resource with other users 48. Prompt detection and repair of all the water fixtures and fittings to reduce water wastage 49. The contractor shall use water bowsers and tankers to bring in water for construction activities i.e., during periods of high-water demand (i.e., during slab formation). 50. Use water efficient appliances & fixtures for conservation of water during the project cycle 51. Institute wastewater treatment and reuse for irrigation of the greenbelt around the project site
Emergence & spread of social vices	52. Use of local labour force as far practical to avoid construction of a labour camp 53. Ensure enforcement of relevant legal policy on sexual harassment and abuse of office 54. Offer awareness, guidance and counselling on HIV/AIDS and other STDs to employees
Social harmony	55. Develop a mechanism to maximise use of local labour force 56. Dedicated Liaison officer to receive & handle grievance from the neighbourhood
Increased energy demand & consumption	57. Install Solar Photovoltaic System 58. Install and routine maintenance of energy efficient appliances e.g., LED bulbs 59. Adoption of natural ventilation & lighting strategies
Storm water management	60. Rainwater harvesting by providing gutters to collect and direct rain water into drains and storage tanks 61. Construct drains to standard specifications 62. Develop a storm water drainage system and linkage to natural drains

Conclusion and recommendation

The proposed development is a timely investment. With timely resourcing of environmental and social safeguards proposed herein will increase the probability of having an environmentally and socially acceptable development that meets the aspirations of the investor, the local community and the country at large.

ACKNOWLEDGEMENT

We take this opportunity to thank Crown Paints Kenya PLC Limited (the project proponent) for giving us the opportunity to undertake this Environmental Impact Assessment exercise.

Special thanks go to Sarah Nyandika (ESIA Expert Reg. No.7168) for coordinating the successful public consultation meetings for the ESIA study for this project. Her active participation during collection of baseline line environmental samples for laboratory analysis the ESIA study for this project was exemplary. Last but not least, she coordinated and actively participated in data collection, data analysis, and reporting for the required specialists' studies for the ESIA study, the data from the specialists' reports is a key component of this ESIA report.

To all stakeholders who were involved in the ESIA study, we say thank you for your valuable input during the assessment process.

ACRONYMS AND ABBREVIATIONS

":	Seconds
':	Minutes
º:	Degrees
ºC:	Degrees Centigrade
Cap.:	Chapter
DOSHS:	Directorate of Occupational Safety and Health Services
DM:	Di-Mineralization
EIA:	Environmental Impact Assessment
ESIA:	Environmental and Social Impact Assessment
EMCA:	Environmental Management and Coordination Act
ESMP:	Environmental and Social Management Plan
IAPs:	Interested and Affected Parties
Ha:	Hectares
KM:	Kilometres
KM²:	Square Kilometres
NEMA:	National Environment Management Authority
NGO:	Non-Governmental Organization
OHS:	Occupational Health and Safety
R.C:	Reinforced Concrete
RO:	Reverse Osmosis
SHE:	Safety, Health & Environment
SM:	Square Metres
TOR:	Terms of Reference
WRA:	Water Resources Authority
WHO:	World Health Organisation

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1 INTRODUCTION

This Environmental and Social Impact Assessment Study Report has been prepared on behalf of Crown Paints Kenya PLC Limited in line with the provisions of section 58 Environment Management and Coordination Act (EMCA), 1999.

1.1 Proposed Project Site

The site for the godowns for the proposed Emulsion Binder Factory and Plastic Injection Moulding Plant is Land Reference Number 12648/179 and 12648/180 situated in Lukenya Area in Kinanie Sub-Location, Kinanie Location, Kinanie Division, Athi River Sub – County, Machakos County.

The GPS coordinates for the project site are Latitude 1°28'27.6" South and Longitude 37°03' 02.7" East.

The site is located off Mombasa Road and is accessible via the road heading to Daystar University Athi River Campus from Mombasa Road; the site is approximately 1km away from the Daystar University - Mombasa Road Junction.

Figure 1: Location Map of the site for the proposed development

1.2 Project Proponent

The project proponent is Crown Paints Kenya PLC Limited.

The proponent`s certificate of incorporation and KRA PIN in annex 2.

1.3 Project Justification

Crown Paints Kenya PLC Limited, manufactures about 80% of its paint products that are based on Emulsion Binder (generally called water-based paints). Most of the raw materials for paint manufacturing including Emulsion Binder are imported, Emulsion Binder being one of the largest in volumes. Currently, Crown Paints Kenya PLC - a top importer brings to the country almost 600 to 700 Metric tonnes of Emulsion Binder every month, approximately 50% of the imported Emulsion Binder is water. Accordingly, instead of importing the Emulsion Binder, Crown Paints Kenya PLC Limited is proposing to construct an Emulsion Binder Factory in Lukenya.

Also, currently, Crown Paints Kenya PLC Limited sources plastic buckets for packaging of its paints from different plastic buckets manufacturers locally. This leads to different dimensions and designs of the plastic buckets. To address this challenge, Crown Paints Kenya PLC Limited is desirous of constructing a modern state of the art Plastic Injection Moulding Plant at Lukenya.

The project area has an average of 4 to 6 peak sunlight hours daily, this is an ideal location for Solar Photovoltaic (PV) systems, which offer significant environmental benefits compared to fossil fuel sources, towards this end, the project proponent is proposing to install two (2) Solar Photovoltaic (PV) systems. The two (2) Solar Photovoltaic (PV) systems will generate green energy for the proposed facility. The systems will offer the primary power sources with other sources like KPLC authority power source and LPG Fired Generator being the back-up power sources.

1.4 Project Description

The proposed development will comprise two main blocks: one block to house the Emulsion Paint Binder factory and the other block to house the Plastic Injection Moulding Plant. In total the two blocks will cover an area of approximately 6 600 square metres (sm). Details of the main components of the proposed development are summarised below:

i) Emulsion Paint Binder factory block:
   c) Ground floor – 2400sm
   d) Mezzanine 1 & 2 – 1200sm

ii) Plastic Injection Moulding Plant block
   c) Ground floor – 2400sm
   d) Mezzanine 1 & 2 – 600sm

iii) Green areas 10% of site area – 4000sm and

iv) Parking and circulation paved area – 8000sm

The substructures for the two blocks will be made of reinforced concrete foundations and structural steel columns and beams, while superstructures (the buildings envelope and roof) will be structural steel frame clad with galvanized pre-painted sheeting interspaced with polycarbonate lighting sheets. The ground floors will be reinforced concrete slab.

The upper mezzanine floors will have floors made of steel chequered plate on steel beams and columns. Each block will have lateral dimension of 54 x54 meters. Internally, each block will have two sections

separated by a 6m wide firebreak. One side will have mezzanine floor and other will have a double volume storage space of 9m high.

The proposed two (2) Solar Photovoltaic (PV) systems design will allow for mix of Grid-tie system to cover the production line and one central hybrid system to cover the general load like security, office administration, ICT services, and forklift charging services as well as plant controls.

Both system will be designed to be a modular system to allow future growth, with hybrid system only system that will have battery back system.

The system will have the following components:

iv. One Central Hybrid system: this will be a 100kW system - the system will have 216 number 615w solar modular panels - the system will be coupled with 40kWH battery storage.
v. Line production 1: it will be a Grid-tie system and it will be a rated 400kW system - the system will have 960 number 615w solar modular panels - the system will not have storage.
vi. Line production 2: it will be a Grid-tie system and it will be a rated 400kW system - the system will have 960 number 615w solar modular panels. The system will not have storage.

1.5 Project's Objective

The objective of the proposed development is to construct and operate an Emulsion Paint Binder Factory and Plastic Injection Moulding Plant on the proposed project site.

1.6 Objectives of ESIA the study

General Objective

The general objective of the ESIA study is to carry out a systematic examination of the present environmental situation within the project area to determine the likely impacts of the proposed development with a view of improving the sustainability of the project.

Specific Objectives of the ESIA Study

(i) To highlight environmental issues of the proposed project with a view to guiding policymakers, planners, stakeholders and government agencies to help them understand the implications of the proposed project on environmental elements within the project area;
(ii) To review existing legal institutional, and policy framework relevant to the proposed project;
(iii) To find out impacts associated with the implementation of the proposed mixed used development to suggest mitigation measures for the negative impacts;
(iv) To assess and give recommendations on the various mitigation measures to be taken to reduce possible negative impacts on the proposed piece of land for development;
(v) Analyse occupational health and safety issues associated with the proposed project;
(vi) To determine the compatibility of the proposed development with the neighbouring land uses evaluate local environmental conditions;
(vii) Facilitating meetings for the stakeholders to air their views;

(viii) Identifying and contacting the project stakeholders to seek their views on the proposed project;
(ix) To assess the relative importance of the impacts of alternative plans, design and sites;
(x) To generate baseline data for monitoring and evaluation of how well the proposed mitigation measures are being implemented during the project operation period;
(xi) To develop an Environmental and Social Management Plan (ESMP) to guide in decision making and for future auditing;
(xii) To raise stakeholder awareness on potential impacts of the project on the environment with a view to making them understand the implication of the project in their environment;
(xiii) To develop an ESIA report in conformity with the EMCA 1999, Environmental (Impact Assessment and Audit) Regulations 2003 and EMCA and secondary legislations under it; and
(xiv) Submission of the final EIA report to NEMA and subsequent follow up to obtain relevant authorization/permit in order for the project to commence.

This ESIA Study report, therefore, details the positive and negative effects of the development on the project environment and recommends appropriate environmental and social measures to minimize any undesirable effects resulting from the project.

1.7 Terms of Reference (ToR)

The following Terms of Reference apply to the project:
(i) Screening and scoping.
(ii) Establishing the suitability of the proposed location for the proposed housing development
(iii) Carry out a literature review.
(iv) Carry out preliminary fieldwork.
(v) Prepare the TOR for submission to NEMA for consideration and approval.
(vi) Undertake detailed fieldwork.
(vii) Carry out baseline investigations and analyses.
(viii) Hold meetings with the project proponent, other project consultants, relevant regulatory government bodies, and stakeholders.
(ix) Carry out a systematic environmental assessment at the proposed project site and the surrounding area in line with established standards and laws.
(x) Provide a description of the proposed activities throughout the entire implementation process of the project with a special focus on potential impacts to the surrounding environment and facilities.
(xi) Develop an Environmental Management Plan and cost estimates for the proposed mixed-use development.
(xii) Produce an Environmental and Social Impact Assessment report that contains among other issues potential negative and positive impacts and recommendation of appropriate mitigation measures to minimize or prevent adverse impacts.

A copy of the terms of reference approval letter is attached in annex 5.

1.8 Methodology

The methodology used in the ESIA Study included the following.

i. A site reconnaissance and visual survey to determine the baseline information of the project area;
ii. Comparative study of the project with existing land uses in the neighbourhood;
iii. Reviewing and analysis of the project documents;
iv. Discussion with the proponent and the design team;
v. Assessment of the site to detail the various existing and likely impacts;
vi. Assessment of health and safety issues;
vii. Seeking public views through interviews and questionnaire administration;
viii. Proposal of mitigation measures to minimize any negative impacts; and
ix. Preparation and submission of ESIA study report to NEMA.

i. Screening

Environmental screening was applied at the preliminary stage to determine whether the proposed development required an Environmental Impact Assessment. With reference to the second schedule of EMCA (1999), the proposed project was identified as among those that requires Environmental Impact Assessment so as to ensure that negative impacts from the project are mitigated as the positive ones are amplified.

ii. Approaches to undertaking the ESIA

This ESIA Project Report has been prepared in accordance with the Environmental (Impact Assessment and Audit) Regulations of 2003. It is also guided by the general principles of green buildings. The study methodology also comprised the following activities:

1. Desktop study;
2. Field investigations of air, noise and groundwater
3. Public meetings & neighbourhood consultations

iii. Desktop Study

The desktop study involved:

(i) Initial meetings with project architects and engineers to discuss the proposed project, including activity options under consideration;
(ii) Preparation of a checklist that consisted of a simple catalogue of environmental factors, which were compared with the activities to be performed;
(iii) Collection and review of baseline data, maps, reports and other relevant information on the existing environmental and social conditions of the project area;
(iv) Review of existing legislation, regulation and policies relevant to the proposed project; and
(v) Review of proposed project engineering designs and construction inputs, including anticipated technical processes.

iv. Field investigations

Field investigations involved:

(i) The site walks within the project area and the neighbouring areas that are within the zone influenced by the project;
(ii) Taking photographs of significant aspects to assist in describing the baseline environmental and social conditions of the project area and its influence zone;
(iii) Taking the site coordinates and the area elevation;
(iv) Interviews with representatives of relevant key regulatory authorities within the project area and interested and affected parties mainly within the project influence zone; and
(v) Filling in the questionnaires to facilitate environmental impact data collection.

The aim of the field investigations was to verify information and data collected during the desktop study and to collect any new information that may have been important in the assessment of impacts and design of mitigation measures.

v. Report Preparation & Outline

A draft ESIA study report was prepared and submitted to the proponent for review and discussion. The findings of the assessment were discussed amongst the proponent, the project lead consultant and the ESIA experts. This was necessary to appreciate the various responsibilities and modalities of implementing the proposed project. The final report was then prepared and submitted to the proponent for endorsement.

1.9 Potential Project Impacts

a) Potential Positive Impacts

The positive impacts associated with the proposed project include the following:

1. The proponent will reduce by 50% of importation and shipments of emulsion binder as water is the other 50% component
2. The proponent will reduce the import and handling costs and transportation importation and shipments of emulsion binder
3. Plastic Injection Moulding Plant will ensure the proponent's manufactured plastic buckets will have consistent design and quality
4. Enhanced land use - the proposed project will put the land to a more productive use than it is now
5. Generation of revenue for both the government and developer
6. Improved security in the area
7. Development of social amenities
8. Employment opportunities
9. Enhancement of other businesses

b) Potential Negative Impacts

1. Storm water generation

2. Air Pollution, particles and dust emission
3. Noise and Excessive Vibrations
4. Traffic impact
5. Solid Waste Generation
6. Water Demand and Usage
7. Energy Demand and Usage
8. Increase Generation of Effluent/Liquid Waste
9. Occupational Health and Safety
10. Light pollution

1.10 Public Consultations

Public consultations are critical in conducting an effective ESIA. Public consultations consisted of the use of public meetings, key informant interviews and questionnaires. Compilation for public consultation feedback is found in public consultation section of this report.

1.11 Constraints & Limitations

The information presented in this report is by and large consistent with the data and information gathered through the various sources and approaches outlined above. However, just as in any study, the exercise experienced a number of constraints and as a result, there could be some gaps of information in the report as the consultants could not exhaust the collection of all primary data.

1.12 Project Cost

The estimated project cost is Kenya shillings One Hundred Forty-One Million, Two Hundred Thirty-Nine Thousand Seven Hundred Sixty-One (Ksh 141,239,761/=). Summary pages of the Bill of Quantities is attached in annex 4.

1.13 ESIA Study Output

This ESIA study report is prepared for purposes of presenting pertinent information to NEMA for review and licensing of the project.

1 BASELINE INFORMATION

1.1 Introduction

The following baseline information details on environmental, socio-economic and bio-physical characteristics of the site. This information will provide a benchmark for continued monitoring and assessment of the impact of implementing the proposal on the environment.

1.2 Project Location

The proposed development will be constructed on Land Reference Numbers 12648/179 and 12648/180 situated in Lukenya Area in Kinanie Sub-Location, Kinanie Location, Kinanie Division, Athi River Sub – County, Machakos County. The GPS coordinates for the project site are Latitude 1°28'27.6" South and Longitude 37°03' 02.7" East. The site is located off Mombasa Road and is accessible via the road heading to Daystar University Athi River Campus from Mombasa Road; the site is approximately 1km away from the Daystar University - Mombasa Road Junction.

1.3 Land Use

The current user of the proposed project site (L.R. Nos. 12648/179; and 12648/180) is industrial.

Refer to annex 5 for copy of land use approval.

1.4 Existing Condition of the Project Site

The proposed project site is undeveloped. However, there is a masonry boundary wall around the project site. Also, there is a temporary store and washrooms on the site.

Plate 1: Section of existing masonry boundary wall around the project site

1.5 Neighboring Developments

Upcoming Superior Homes borders the project site on the eastern side.

Brava Food Industries Limited is located approximately 300 meters away from the proposed project site.

Several godowns / warehouses are currently being built in the vicinity of the proposed project site.

Across Mombasa Road, Small World Country Club and Simba Cement factory are situated approximately 1km and 2.2km respectively away from the proposed project site.

1.6 Baseline Air Quality, Soil, Water and Noise level

Baseline air and soil quality was ascertained to be within the acceptable limits as the laboratory results of air and soil samples which were picked for analyses were found to be within the acceptable limits.

The proposed project site and the neighbourhood has no any surface water and underground water, accordingly, no water samples were picked for laboratory analysis.

Baseline noise level was measured and found be within the acceptable limits.

Refer to annex 6 for copy of laboratory results for the baseline air quality, soil quality, and noise level.

1.7 Soils

Soils in the area are mostly deep black vertisols commonly known as black cotton soils. The soils have a high content of expansive clay known as montmorillonite that have a tendency to form deep cracks in drier seasons or years.

1.8 Biodiversity (Fauna and Flora)

The proposed project area falls within the Athi-Kapiti Ecosystem. However, human development in the area has significantly blocked the then existing wildlife migratory corridors between the area and the Nairobi National Park.

The proposed project site has sparse ASAL grass and shrubs. A few wild animals were observed in the surrounding area.

As part of the ESIA study for the proposed development, a Biodiversity Impact Assessment Study was carried out, from the study, the impact of the proposed project on the local biodiversity was found to be insignificant (refer to annex 10 for a copy of Biodiversity Impact Assessment Study report).

Plate 2: ASAL grasses and scrubs on the proposed project site

1.9 Climatic conditions

Machakos County enjoys a pleasant climate similar to that of Nairobi although relatively warmer, varying from highland equatorial on the hill summits, to semi-arid on the plains. The district is semi-arid and receives very little and erratic precipitation. The area has 21 distinct rainy seasons. The long rains fall between March and May and the short rains fall between October and December. The annual average rainfall varies from 500-1300mm with high altitude areas receiving more rain than low-lying areas. The temperatures also vary with altitude. The mean monthly temperature ranges from 12°C in the coldest months (July-August) to 25°C in the hottest months (March and October).

1.10 Hydrology

The area has limited surface and underground water resources.

Recently, a borehole was drilled on the site. However, the borehole was found not to have enough water.

Refer to
annex 7 for a copy of the borehole completion report.

1.11 Water Supply and Sewer System

The area is served by piped water from Mavoko Water and Sanitation Company. Privately-owned boreholes supplement water supply from the Mavoko Water Company.

The area has no public sewer system. Hence use of septic tanks for sewerage management is common in the area.

1.12 Transport and Communication Network

The project area has a well-developed transport and communication network that opens up and links the site to other areas.

As part of the ESIA study, a Traffic Impact Assessment study was carried out, from the study, it was found out that the proposed project will not have significant negative impact on the area's traffic flow.

Refer to annex 10 for a copy of the Traffic Impact Assessment study report.

1.13 Electricity Supply

The proposed development will be connected to the Kenya Power and Lighting Company power supply line. The KPLC electricity supply lines are already available within the neighbourhood of the proposed project site. There will also be a solar photovoltaic (PV) system installed.

2 CLIMATE CHANGE RISK AND VULNERABILITY ASSESSMENT

2.1 Introduction

The proposed development will be developed within a context of increasing climate variability and change, which poses potential risks to environmental sustainability, community welfare, and the long-term resilience of the operation of the facilities. To address these risks, a Climate Change Risk and Vulnerability Assessment was carried out to ensure that the development is designed and operated in a manner that minimizes risks, safeguards natural resources, and enhances adaptive capacity for both the proponent and the surrounding community.

2.2 Major Climate Risks Identified

The following major risks have been identified:

i. Rising temperatures - the Mean annual temperatures are projected to increase, with more frequent and prolonged heatwaves. This may lead to increased energy demand for cooling, reduced worker productivity, and deterioration of infrastructure exposed to excessive heat.
ii. Rainfall variability - erratic rainfall patterns, with extended dry spells punctuated by intense rainfall, are expected. These may cause droughts, impacting water availability for industrial operations, while heavy downpours may overwhelm drainage systems, resulting in localized flooding.
iii. Extreme weather events - Climate change is expected to increase the intensity of floods and droughts. Flooding events can disrupt transport routes, damage infrastructure, and contaminate water sources, while droughts may exacerbate competition for limited water between industries and communities.
iv. Air quality fluctuations - while industrial activities contribute to air quality concerns, climate variability—such as temperature inversions during dry seasons—may intensify the persistence of pollutants in the atmosphere, affecting both workers and nearby communities.

2.3 Priority Sectors at Risk

Based on the identified risks and vulnerabilities, the following sectors and systems are considered priority areas requiring special attention:

i. Water Resources - the sustainability of water supply is at the core of both project operations and community well-being. Increased climate variability will intensify pressure on local sources, raising the risk of scarcity and conflict.
ii. Energy Supply - higher average temperatures will raise electricity demand for cooling systems, while climate-related disruptions to national or regional power infrastructure could reduce reliability.
iii. Infrastructure - factory buildings, storm water drainage systems, and access roads are vulnerable to flooding and heat stress, necessitating climate-proof design and construction.
iv. Health and Safety - higher occupational exposure to heat and potential air pollution increases risks to workers, while communities may also face climate-aggravated health impacts such as respiratory conditions or waterborne diseases.

2.4 Adaptation and Resilience Recommendations

To enhance resilience and safeguard both the project and the surrounding environment, the following adaptation strategies are recommended:

i. Water Management - incorporate rainwater harvesting, water recycling systems, and high-efficiency fixtures within the factory. Collaborate with local stakeholders in water stewardship programs to ensure equitable access and reduce competition during dry periods.
ii. Energy Efficiency and Renewable Energy - invest in energy-efficient cooling systems, improve building design for natural ventilation, and integrate solar photovoltaic systems to reduce reliance on grid power and enhance reliability.
iii. Climate-Resilient Infrastructure - design factory structures and drainage systems to withstand heavy rainfall and flooding. Incorporate permeable paving, retention ponds, and green roofs to enhance storm water management.
iv. Green Infrastructure and Buffering - establish vegetation buffers around the facility to reduce ambient heat, improve air quality, and enhance carbon sequestration.
v. Occupational Health and Safety - strengthen worker protection measures, including personal protective equipment for heat and dust, improved ventilation, and regular monitoring of workplace air quality.
vi. Community Engagement - develop and implement a Corporate Social Responsibility (CSR) initiatives that support community resilience, including investments in water supply systems, environmental conservation, and climate-smart livelihoods.
vii. Institutional Strengthening - align project design and implementation with the Kenya Climate Change Act (2016) and the Machakos County Climate Change Action Plan. The developer is required to participate in county-level forums to strengthen collective climate action and knowledge sharing.

3 PROJECT DESIGN & DESCRIPTION

3.1 Nature of the project

The proposed project is a greenfield project.

The project activities will entail construction of temporary site offices; temporary sanitary facility; and store, excavation of the highly expansive black cotton soils and top vegetative soils from the site, removal and dumping of excavated soils, sourcing and transportation building materials to the site, backfilling of excavated site, construction, operation, and decommissioning.

3.2 Project Justification

Crown Paints Kenya PLC Limited, manufactures about 80% of its paint products that are based on Emulsion Binder (generally called water-based paints). Most of the raw materials for paint manufacturing including Emulsion Binder are imported, Emulsion Binder being one of the largest in volumes. Currently, Crown Paints Kenya PLC - a top importer brings to the country almost 600 to 700 Metric tonnes of Emulsion Binder every month, approximately 50% of the imported Emulsion Binder is water. Accordingly, instead of importing the Emulsion Binder, Crown Paints Kenya PLC Limited is proposing to construct an Emulsion Binder Factory in Lukenya.

Also, currently, Crown Paints Kenya PLC Limited sources plastic buckets for packaging of its paints from different plastic buckets manufacturers locally. This leads to different dimensions and designs of the plastic buckets. To address this challenge, Crown Paints Kenya PLC Limited is desirous of constructing a modern state of the art Plastic Injection Moulding Plant at Lukenya.

The project area has an average of 4 to 6 peak sunlight hours daily, this is an ideal location for Solar Photovoltaic (PV) systems, which offer significant environmental benefits compared to fossil fuel sources, towards this end, the project proponent is proposing to install two (2) Solar Photovoltaic (PV) systems. The two (2) Solar Photovoltaic (PV) systems will generate green energy for the proposed facility. The systems will offer the primary power sources with other sources like KPLC authority power source and LPG Fired Generator being the back-up power sources.

3.3 Excavation, removal and dumping of the highly expansive black cotton soils and top vegetative soils from the site

In order to pave way for the construction of the proposed facility, the highly expansive black cotton soils and top vegetative soils from the site will been excavated and removed from the site.

The excavated black cotton soils and top vegetative soils from the site will be disposed of at approved dumpsites.

3.4 Sourcing and transportation of building materials to the site

Building materials will be sourced from certified suppliers. Most of the building materials will be sourced from the locality in order to minimize on transportation costs. The sourced materials will be transported to the project site for storage and use.

3.5 Backfilling and compaction of excavated site

The excavated site will be backfilled with marrum sourced from a certified quarry, the backfilled site will be compacted.

3.6 Project Design Criteria and Characteristics

The design criteria and characteristics of the building include the following among others:

i. All works to be carried out in accordance with the County Government's regulations
ii. All drainage passing under building and drive areas to be of PVC pipe and encased in thick concrete surround
iii. All inspection chambers in drive areas to have heavy duty covers
iv. All sanitary work to be in accordance with Ministry of Health rules and regulations and Local Authority's requirements
v. All reinforced concrete (RC) works to be to structure engineer's details

3.7 Commencement of Project Construction Activities

The project construction activities will start immediately NEMA and the Machakos County Government's approvals have been secured. The construction is expected to be completed in the shortest time possible.

3.8 Existing technology

The construction involved earth work, foundation and building and construction involving mixing different types of building materials among other procedures. The subsequent processes included the following:

- Assembling of the materials and machinery required for the construction activities
- Hiring the required personnel
- Commencing the construction according to the approved project plans.
- Making the final touches on the finished units.
- Connection to the necessary services such as electricity and water.
- Occupation of the facility.

3.9 Components of the building blocks

The proposed development will comprise two main blocks: one block to house the Emulsion Paint Binder factory and the other block to house the Plastic Injection Moulding Plant. In total the two blocks will cover an area of approximately 6 600 square metres (sm). Details of the main components of the proposed development are summarised below:

v) Emulsion Paint Binder Factory block:
   e) Ground floor – 2400 sm
   f) Mezzanine 1 & 2 – 1200 sm

vi) Plastic Injection Moulding Plant block
   e) Ground floor – 2400 sm
   f) Mezzanine 1 & 2 – 600 sm

vii) Green areas 10% of site area – 4000 sm and

viii) Parking and circulation paved area – 8000 sm

The substructures for the two blocks will be made of reinforced concrete foundations and structural steel columns and beams, while superstructures (the buildings envelope and roof) will be structural steel frame clad with galvanized pre-painted sheeting interspaced with polycarbonate lighting sheets. The ground floors will be reinforced concrete slab. The upper mezzanine floors will have floors made of steel chequered plate on steel beams and columns. Each block will have lateral dimension of 54 x54 meters. Internally, each block will have two sections separated by a 6m wide firebreak. One side will have mezzanine floor and other will have a double volume storage space of 9m high.

Refer to the attached architectural drawings in annex 9.

The proposed two (2) Solar Photovoltaic (PV) systems design will allow for mix of Grid-tie system to cover the production line and one central hybrid system to cover the general load like security, office administration, ICT services, and forklift charging services as well as plant controls.

Both system will be designed to be a modular system to allow future growth, with hybrid system only system that will have battery back system.

The system will have the following components:

viii. One Central Hybrid system: this will be a 100kW system - the system will have 216 number 615w solar modular panels - the system will be coupled with 40kWH battery storage.
ix. Line production 1: it will be a Grid-tie system and it will be a rated 400kW system - the system will have 960 number 615w solar modular panels - the system will not have storage.
x. Line production 2: it will be a Grid-tie system and it will be a rated 400kW system - the system will have 960 number 615w solar modular panels. The system will not have storage.

3.10 Installation of factory machinery in the building blocks

Once the construction of the building blocks is completed, the required machinery for Emulsion Binder Factory and Plastic Injection Moulding Plant will be installed

3.11 Emulsion Binder production

3.11.1 Emulsion Paint Binder Polymerization

Emulsion binder is produced through Emulsion polymerization, the process involves the reaction of relatively water-insoluble monomers such as Styrene and Butyl acrylates leading to submicron latex particles dispersed in aqueous phase with the aid of surfactants, catalyst and stabilizers

The Emulsion polymerization process is generally divided into three distinct stages:

i) Nucleation of particle nuclei by capture of oligomeric radicals by the monomer-swollen micelles (Interval I),
ii) Growth of latex particles by recruiting monomer and surfactant from the emulsified monomer droplets (Interval II), and
iii) Depletion of residual monomer in the latex particles, i.e., completion of the polymerization process.

Final product is micron solids from polymerization, styrene acrylate polymer dispersed in water and stabilized to a milky appearance.

3.11.2 Raw materials

The main raw materials Emulsion Paint Binder production includes: Demineralised water; Butyl Acrylate Monomer; Styrene Monomer; Methyl Methacrylate Monomer; Acrylic Acid; Acrylamide; Liq. Ammonia; DOWFAX 2A1 Emulsifier; Aerosol A102; Ethyl Acrylate Monomer; Silene; Sodium Bicarbonate; Defoamer SN 1370; Sodium Sulphate; Emulsifier AOS; SLS 30% Solution; TBHP Eroxide Solution; SBC; SMBS, etc.

No solvents are used in the Emulsion binder production process. And there are no direct waste or by-products produced from the process.

3.11.3 Emulsion Paint Binder production process

Emulsion Paint Binder production process entails the following: refer to layout below (figure 2):

a) The top vessels are used to premix the monomers and additives;
b) The middle vessels are called reactors which have heating and cooling arrangements. These reactors carry the water phase and additives, pre-heated to 70-80**ºC** and then the contents from pre-mix vessels above are added slowly while stirring. Pre-heating is done with steam and cooling is with water and cooling tower;
c) As the reaction proceeds, heating is stopped and cooling starts in order to maintain the reaction temperature at 80**ºC**. Normally, complete reaction process will take about 6-7Hrs. the product is tested for parameters like viscosity, clarity, bittyness and gloss before discharging;
d) The bottom vessel, known as thinning vessel, carries the product once the process is completed and parameters adjusted before filling in 200L/1000L tanks. As filling is in progress, stages 1, 3 and 3 can continue for another batch.

During the production process, all additions and stages controls are through SCADA/ PLC control system, reducing manual errors, consistent quality and waste reduction.

Process water requirement is of very low conductivity, less than 5microSeimens, and is generated by treating process water through a DM plant in conjunction with a RO Plant.

Waste water generation will be minimal as batches are processed continuously. All waste or cleaning water will be treated in ETP and reused for gardening.

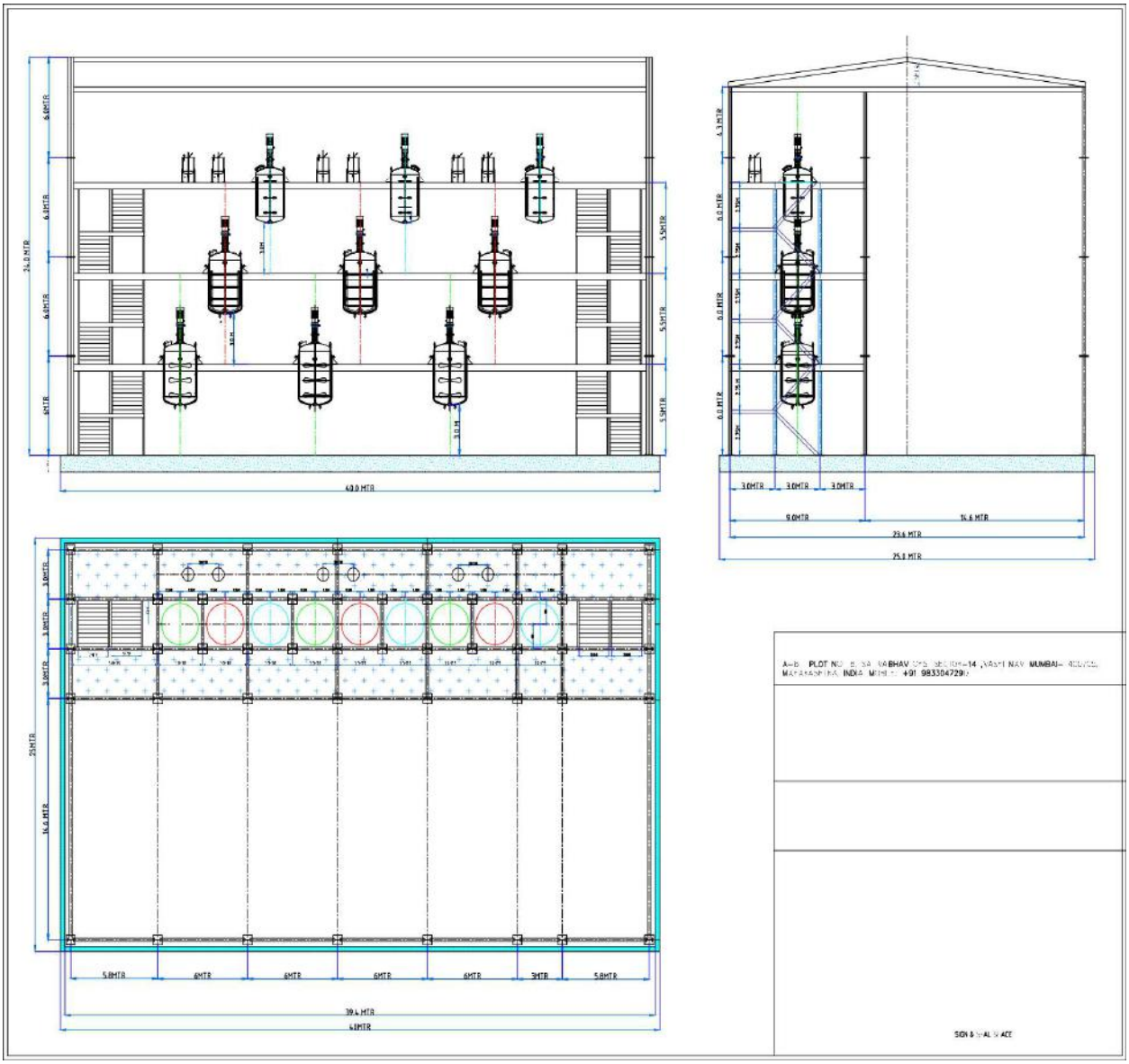

Figure 2: layout of Emulsion Paint Binder Production Process

3.12 Plastic Injection Moulding Plant

3.12.1 Introduction

Emulsion binder production Crown Paints Kenya PLC Limited proposes to adopt the latest technology in Plastic Injection moulding.

The raw materials are plastic pellets (resin) and additives such as Polypropylene master batches.

The raw materials There will be no dust production.

Apart from water being required for cooling purposes (in closed system), no water is required in the process of Plastic Injection moulding. Accordingly, no waste water is produced.

All waste plastic generated will be ground and reused in the Plastic Injection moulding process.

3.12.2 Plastic Injection Moulding Process

A typical plastic injection moulding process entails the following steps:

a) Product design: a detailed design of the product is done; the product design will guide the creation of appropriate mould;
b) Mould design and fabrication: a mould consisting of two halves is created based on product design;
c) Raw material selection: based on the product's requirements, appropriate plastic materials are selected;
d) Clamping: the mould is mounted onto the injection moulding machine using either hydraulic or mechanical force in order to prevent leakage during the injection process;
e) Injection: plastic pellets (resin) are fed into the injection moulding machine's hopper where they are heated and melted. The molten plastic is then injected into the mould cavity under high pressure ensuring it fills every part of the mould;
f) Cooling: after filling the mould cavity, cooling and solidifying of the product begins. Cooling channels within the mould help to speed up the cooling and solidification process;
g) Ejection: once the product has cooled and solidified, the mould opens and ejection pins push out the product from the mould cavity; and
h) Trimming and finishing: flash is removed from the product and other additional processes such as drilling, printing, assembly to mention a few are performed depending on the product requirement.

3.12.3 Injection Moulding Machines to be installed

They will include: Haitian V Series hybrid injection moulding machines: 2 sets of MA 700 V / 5000, 20L bucket machines; 2 sets of MA 4700 V / 3200, 4L bucket machines; 2 sets of MA 2800 V / 1350, lids machine; 1 set of MA 1600 V / 575, handle machine; 2 sets of 20L bucket moulds -1CAVITY; 1 set of 20L bucket lid moulds – 2 cavities; 1 set of spout cap moulds- 2 cavity; 1 set of 4L bucket mould – 2 cavity; 1 set of 4L bucket lid mould - 2cavity; 1 set of 4L handle mould – 12 cavity; 3 sets of in mould labelling systems (3 axis servo driven-robot); 4 sets of vacuum hopper loaders SAL 1.5ug; 3 sets of vacuum hopper loader SAL 800g; 1 set of vertical material mixers SVM200; 1 set of central chiller (water cooled type) with 1000litres insulated SS water tank; 1 set of cooling tower 250TR; 1 set of strong crusher SG 800F; 4 sets of Kirloskar water pumps 10HP

3.13 Proposed Solar Photovoltaic System

The proposed two (2) Solar Photovoltaic (PV) systems design will allow for mix of Grid-tie system to cover the production line and one central hybrid system to cover the general load like security, office administration, ICT services, and forklift charging services as well as plant controls.

Both system will be designed to be a modular system to allow future growth, with hybrid system only system that will have battery back system.

The system will have the following components:

xi. One Central Hybrid system: this will be a 100kW system - the system will have 216 number 615w solar modular panels - the system will be coupled with 40kWH battery storage.
xii. Line production 1: it will be a Grid-tie system and it will be a rated 400kW system - the system will have 960 number 615w solar modular panels - the system will not have storage.
xiii. Line production 2: it will be a Grid-tie system and it will be a rated 400kW system - the system will have 960 number 615w solar modular panels. The system will not have storage.

3.14 Project Cost

The estimated project cost is Kenya shillings One Hundred Forty-One Million, Two Hundred Thirty-Nine Thousand Seven Hundred Sixty-One (Ksh 141,239,761/=).

Summary pages of the Bill of Quantities is attached in annex 4

4 PUBLIC PARTICIPATION & CONSULTATION

4.1 Introduction

Consultation with various stakeholders and public participation was done throughout the Environmental Impact Assessment Project Report preparation and compilation. This was in line with the requirements of Legal Notice No. 101, Kenya Gazette Supplement No. 56 of June 13th 2003, the Environmental (Impact Assessment and Audit) Regulations, 2003.The consultation was vital as it served to:

a. Inform all stakeholders of the proposed development within their locality.
b. Explain to the stakeholders the nature of the proposed project, its objectives and scope.
c. Give stakeholders a forum to present their views, concerns and issues regarding the proposed development.
d. Obtain suggestions from stakeholders on possible ways that potential negative impacts can be effectively mitigated.

The consultation was in the form of interviews, questionnaire surveys and holding 3 public consultation barazas/meetings.

4.2 Public Consultation meetings schedule

Public consultation barazas were organised through the office of the County Commissioner (CC) Machakos County. The public barazas were held on the proposed project site on 24th September 2025, 15th October and 29th October 2025 (Table 2).

Once the dates and venues of the meetings were confirmed, public notices were printed and posted in strategic public places in the vicinity of the site of project area at least seven days before the days for the 3 meetings. Also, announcement of the notice was made over the radio with a nationwide coverage at least once a week for two consecutive weeks.

Additionally, a public notice about the proposed project was published for 2 successive weeks in a newspaper that has a nationwide circulation.

Last but not least, invitation letters were sent out 7 days before the days of the meetings.

Find evidence of the notice/announcement in annex 8.

Table 2: Schedule of the 3 public consultation barazas / meetings

Meeting Venue	Date	No. of attendees	Chairman
Project site	24th September 2025	36	Area Chief – Timothy Musinga

Project site	15th October 2025	32	Area Chief – Timothy Musinga
Project site	29th October 2025	43	Area Chief – Timothy Musinga

Plate 3: One of the public notices posted on the boundary wall on the project site

4.2.1 Questions asked and concerns raised during public consultative meetings

Main questions asked and key concerns raised during the public participation were:

1. Local residents especially youths should be prioritized for employment during construction activities. At least 75% of the workforce should come from the locality
2. Proper management of storm waters from the building as the area has a history of severely being affected by storm waters during heavy rains
3. The developer should offer the community CSR projects, with a consideration prioritizing a boda boda shed and stalls for business ladies who sell items along the streets in the area.
4. Have you secured no objection from the local residents' association?
5. Will public views / concerns be taken into consideration during the approval of the proposed development?
6. Explain to us the legal process which will be followed before construction of the proposed development starts.
7. Confirm if the change of use for the project site (to industrial use) has already been completed by the Physical Planning Office of the County Government of Machakos.
8. Let us know the status of approval of the proposed development by the County Government of Machakos.

9. Have you resolved/settled objections against the project raised by some local residents?
10. What are the raw materials for emulsion binder manufacturing?
11. Explain the manufacturing processes for emulsion binder and plastic injection moulding?
12. Do you anticipate any negative environmental impacts in the manufacture of Emulsion Binder and Plastic Injection Moulding?
13. How will you address the challenge of greenhouse gases, VOCs, sulphur dioxide, and nitrogen oxides production from the proposed emulsion binder and plastic injection moulding plant?
14. What mitigation measures will you put in place to address the negative environmental impacts of manufacturing of emulsion binder and plastic injection moulding?
15. What is your proposed corporate social responsibility plan for the local community?
16. What is your proposed Extended Producer Responsibility (EPR) for the end products from the proposed emulsion binder and plastic injection moulding plant?
17. How will you handle the plastic waste/scrap from the Plastic Injection Moulding plant?
18. What is the relationship between Crown Paints PLC Limited and Metal Cans & Closures Limited who in 2022 had promised to build a factory on adjacent plots (L.R. Nos. 12648/181 and 12648/182), who despite having cleared and excavated the site, they disappeared and to date we are yet to hear from them?
19. Share with us the available specialists report(s) relevant to the proposed project site and the proposed development
20. What is the carbon footprint of the proposed development?
21. How will you reduce the carbon footprint of the proposed development?
22. Share with us the Environmental and Social Management Plan (ESMP) for the proposed development.
23. Let us know if the change of use for the project site (to industrial use) was obtained legally
24. What are the raw materials for manufacture of emulsion binder? Are the raw materials available in the country or imported?
25. How are you handling/managing objections against the proposed development raised by some local residents?

Plate 4: Mr. Ettammal – an manager at Crown Paints Kenya PLC Limited answering questions during the public meeting on 29th October 2025

Plate 5: EIA Team Leader Mr. Aronya addressing the Audience during the Consultative Public Participation held on 29th October 2024

4.3 Consultations beyond ESIA Process

In order to ensure that the development runs smoothly, consultations should be structured to aid the completion of the project implementation. These consultations should therefore be preceded by further engagement of various stakeholders under the following stages:

- Construction phase and reported through the Initial Environmental Audit; and
- Operation phases and reported through the Statutory Environmental Audit of the project.

The consultation should address pertinent issues including the sustainability and suitability of the operation and maintenance to ensure acceptable standards

4.4 Grievance Redress Mechanism

Grievance redress mechanisms are necessary avenues for allowing the project's host community members to voice concerns as they arise and, if necessary, for corrective action to be taken promptly. Such mechanisms are important to achieving transparency in resolving disputes, especially between communities, among community members and the contractor. Therefore, the Consultant proposes that all the grievances to be logged, filed and addressed immediately as they arise and the local community be given an assurance of deserved consideration.

A well-functioning grievance mechanism:

I. Provides an acceptable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, and lasting;
II. Enables more systematic identification of emerging issues and trends and facilitates corrective action.
III. Ensures timely redress of grievances for satisfactory implementation of resettlement and completion of the project interventions as scheduled.

The factors to be considered in the design of an effective grievance procedures include the following:

- A grievance redresses mechanism which is simple, accessible, affordable, and accountable.
- Provide suggestions on how information is made available to the local community.
- The proposed structures have capacity and knowledge to address grievances and would need to be given the authority to resolve complaints.
- A Complaints Form be introduced and should be dully filled by the involved parties.

Therefore, this ESIA has identified procedures that will enable the local community to lodge a complaint or a claim without cost and with the assurance of a timely and satisfactory resolution of that complaint or claim in which case, the dialogue will always suffice.

4.4.1 Grievance Redress Structure

Majority of the complaints resolution would be most appropriate if undertaken at the local level for convenience in terms of time and cost. In addition, the GRM proposed should be credible and acceptable to local community for acceptability of resolutions made thereof. In the proposed grievance redress structure, the aggrieved people will report their grievances, either verbally or in writing, to the Construction Engineer (directly or through the community representative). The complaint will be logged and the established committee will convene to resolve the complaint to the satisfaction of the complainant(s). If the matter cannot be addressed to the satisfaction of the complainant within the prescribed period, the complainant may refer the issue to the chief's office for consideration and if the issue is not resolved to the satisfaction of the complainant, the complainant has the right to seek redress from the Court of law.

4.4.2 Determination of Corrective Action

The grievance team will hold a meeting based on grievance received and deliberate on the raised issue to come up with a resolution within 7 working days. The action will be recorded in the grievance register and verdict reported back to complainants. If more time is required for investigation, this will be clearly communicated verbally and in writing to the aggrieved person in advance.

4.4.3 Mechanisms for Adjudicating Grievances and Appealing Judgments

The nature of the grievance will ascertain the period (not exceeding 7 working days) necessary for the GRC to address the grievance. Where resolution is not reached at the level of the GRC or if the complainant does not

receive a response or is not satisfied with the outcome within the agreed time he/she can escalate/appeal to the Chief's Office. Where the complainant still feels unsatisfied with the response to the appeal from the office of the chief, he/she as a last resort may submit the complaint to a court of law.

4.4.4 Closure of a grievance

All grievances shall be disposed of within 21 days of its receipt and a final reply shall be sent to the complainant. A grievance shall be considered closed when:

- The complainant has shown verbal or in-writing acceptance of the resolution;
- The complainant has not responded within 21 days after receipt of the resolution;
- The complaint has not been appealed within 14 days after receipt of the resolution.

5 Policy, Institutional & Legal Framework

This section of the report discusses the relevant legislations, policies and institutions in Kenya as well as at the international level that frame the approach towards environmental and social impacts of the proposed project, and how the environmental and social impacts should be mitigated.

5.1 National Environmental Guidelines and Policies

The relevant National Environmental guideline and policies are summarised in the table 3 below:

Table 3: Relevant National Environmental guideline and policies

National Environmental Policies	Description	Relevance
Environmental and Development Policy (Session Paper No. 6 1999)	The goal of this Policy is a better quality of life for present and future generations through sustainable management and use of the environment and natural resources	The main objective of this Policy is a better quality of life for present and future generations through sustainable management and use of the environment and natural resources. The proposed development once complete will create employment, stimulate economic growth in the project area.
National Environmental Action Plan (NEAP)	The purpose of the National Environmental Action Plan (NEAP) is to promote and facilitate the coordination of strategies and measures to protect and manage the environment into plans and programmes for the social and economic development of Kenya. The Environmental Management and Coordination Act, 1999, established the NEAP to address the protection and management of the environment at district, provincial and national levels.	The proponent should comply with the NEAP policies and legislative with regards to preventing, controlling or mitigating specific as well as general adverse impacts on the environment. The project activities will interact with the various elements and components of the physical, social and economic environments in ways that could lead to negative impacts. Stakeholders in the project will therefore ensure that projects covered under consideration should be implemented in ways that ensure environmental integrity. Issues of environmental integrity will be addressed through project level Environmental

National Environmental Policies	Description	Relevance
		Impact Assessments (EIAs).
National Environment Policy, 2012	The major objective of the policy is to provide a framework for an integrated approach to planning and sustainable management of Kenya's environment and its natural resources. The policy further ensures that the environment is integrated in all government policies in order to facilitate and realize sustainable development at all levels. This would help promote green economy, enhance social inclusion, improve human welfare and create opportunities for employment and maintenance of a healthy ecosystem.	ESIA study has developed an environment and social management and monitoring plan to mitigate the impacts that may result during the construction and operation phases of the project. This tool is aimed at promoting coordination of environmental management of the project such that sensitive ecosystems are not destabilized by project activities The developer should ensure that the provisions of this policy are followed to ensure the protection of the environment.

5.2 Environmental Institutional Framework

The relevant Environmental Institution(s) are summarised in the table 4 below:

Table 4: Relevant Environmental Institution(s)

Environmental Institution(s)	Mandate and Responsibilities	Relevance to the project/license or permit required/ or activity requiring regulation
National Environment Management Authority (NEMA)	The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. NEMA is responsible for general supervision and, coordination	The Project proponent is required to contract the services of a license EIA expert, submit an ESIA report to NEMA and acquire an EIA license before commencing any construction activities

Environmental Institution(s)	Mandate and Responsibilities	Relevance to the project/license or permit required/ or activity requiring regulation
	of all matters relating to the environment and is the principal instrument of government in the implementation of all policies relating to the environment. The authority is also responsible for monitoring compliance with all the NEMA regulations	
County Environmental Committees	The County Environment Committee shall- (a) Be responsible for the proper management of the environment within the county for which it is appointed; (b) Develop a county strategic environmental action plan every five years for consideration and adoption by the County Assembly. These committees contribute to the decentralization of activities undertaken by NEMA and thus enable local communities to have access to environmental management information. The committees also conduct quick site visits and review environment-related reports of the projects and on occasion could attend site meetings.	The project is in Nairobi City County and will be subject to site visits by the County Environmental Committee. The committee will review environment-related reports of the project and on occasion could attend site meetings
National Environment Complaints Committee, NECC (Public Complaints Committee)	The committee is an environmental ombudsman that was established under sections 31 to 36 of the Environmental Management and Coordination Act no. 8 of 1999 with a mandate to investigate allegations or complaints regarding the condition of the environment in Kenya. It is an important institution in the assessment of the condition of the environment in Kenya	If any disputes will arise in regard to this project, the NECC will also play an important role in the facilitation of alternative dispute resolution mechanisms relating to environmental matters.
National Environment Action Plan Committee (NEAP)	The Environmental Action plan Committee discusses the challenges of climate change for Kenya and underscores the sustainability of Kenya's economic and social development which depend ultimately on proper and responsible	The Plan is a requirement by the Climate Change Act, 2016, which seeks to further Kenya's development goals by providing mechanisms and measures to achieve low carbon.

Environmental Institution(s)	Mandate and Responsibilities	Relevance to the project/license or permit required/ or activity requiring regulation
	management of the natural resource base and the environment in general. The plan also describes the physical environment and follows the thematic areas of nine task forces.	
Standards and Enforcement Review Committee (SERC)	NEMA through EMCA has established standards for the various environmental parameters that require management, and these include the water quality standards, noise and vibration control standards, and the waste management standards, amongst other. SERC, through the Compliance and Enforcement Department of NEMA monitors the compliance level of the project to ensure environmental control standards are implemented. The committee also follows on complaints reported by the public. This is a technical Committee responsible for environmental standards formulation, methods of analysis, inspection, monitoring and technical advice on necessary mitigation measures. The members of the Standards and Enforcement Review Committee are set out in the third schedule of the principal Environmental Management and Co-ordination Act	The committee gives advice on how to establish criteria and procedures for the measurement of water quality and recommends the minimum water quality standards, analyzes conditions for discharge of effluents into the environment, and also carry out investigations of actual or suspected water pollution
National Environmental Tribunal (NET)	The tribunal is formed under section 125 of the EMCA, Cap 387 and handles all cases related to environmental offences in the Republic of Kenya. The tribunal's principal function is to receive, hear and determine appeals arising from decisions of the National Environment Management Authority (NEMA) on issuance, denial or revocation of environmental impact assessment (EIA) licenses, among other decisions.	If disputes with respect to the proposed mixed use development project arise, the NET will function very much like a court of law.

5.3 Relevant National Legislative Framework

The relevant National Legislations, Regulations, Ministerial & County Institutional Integration are summarised in the table 5 below:

Table 5: Relevant National Legislations, Regulations, Ministerial & County Institutional Integration

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
The Constitution of Kenya 2010	• Article 42 of the Constitution states that every person has 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 and other measures, particularly those contemplated in Article 69; and to have obligations relating to the environment fulfilled under Article 70. • Article 69(2) states that every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.	• The proponent has a right to carry out the project within legal limits. • The proponent must ensure that the project is carried out in an ecologically, economically and socially sustainable manner. • The proponent is entitled to a fair administrative decision-making process from NEMA and other State organs. • The project proponent will be required to comply fully with the above stated articles of the Constitution.
Environmental Management and Coordination Act (EMCA) of 1999	• The Environmental Management and Co-ordination (Amendment) Act, 2015 is an Act of Parliament to amend the Environmental Management and Co-ordination Act, 1999, the Act received Presidential assent on 27th May 2015 and commenced on 17th June 2015.	• The proponent will comply fully with the Act.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	• The Act provides for the establishment of appropriate legal and institutional framework for the management and protection of the environment.	
The Sustainable Waste Management Act, 2022 No. 31 of 2022. Date of assent: 6th July, 2022. Date of commencement: 26th July, 2022	• Act of Parliament to establish the legal and institutional framework for the sustainable management of waste • Act ensures the realisation of the constitutional provision on the right to a clean and healthy environment and for connected purposes	• The proponent will comply fully with the Act.
The County Government Act 2012	• This Act vests responsibility upon the County Governments in planning of development projects within their areas of jurisdiction on projects of importance to the local County Government or those of national importance. • Section 102 of the Act provides the principles of planning and development facilitation which include integration of national values in county planning, protect the right to self-fulfilment within the county communities and with responsibility to future generations, protection of rights of minorities and marginalized groups and communities, promotion of equity resource allocation, among	• The proponent will comply fully with the Act. • The project proponent should initiate the process of County Government engagement in the initial project planning through application of essential development approvals from the County Government of Machakos.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	others.	
The Sustainable Waste Management (Extended Producer Responsibility) Regulations. Legal Notice 176 of 2024	• Extends the responsibility of a producer over a product and its packaging during the life cycle of the product or its packaging • Provides a framework for the establishment and operation of mandatory extended producer responsibility schemes • Operationalises the polluter pays principle.	• The proponent will comply fully with the Regulations.
Management and Control of Plastic Packaging Materials Regulations. Legal Notice 181 of 2024	• Establishes a framework for the management and control of the use of plastic packaging material • Promotes the use of environmentally-friendly packaging material • Preserves and promotes a clean and healthy environment for sustainable development • Promotes the recycling of plastic packaging material.	• These regulations apply to all plastic carrier bags and plastic packaging materials and all plastic packaging materials on imported products.
Environmental Management & Coordination (Waste Management) Regulations 2006	• Provides standards for handling, transportation & disposal of various types of waste including hazardous waste. • Requirements to ensure waste minimisation or cleaner production, waste segregation, recycling or composting • Provides for licensing of vehicle transporting waste	• Disposal of generated waste from operations under the project. • Generation of hazardous wastes such as used oil & oily parts from servicing of equipment & vehicles. • Ensure there exists proper contractual agreement with NEMA licensed solid waste handlers and that solid wastes are collected promptly and disposed

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	• Provides for licensing of waste disposal facilities	of responsibly.
Air Quality Regulations, (Legal Notice No. 34 of 2014)	• These regulations are aimed at controlling, preventing and abating air pollution to ensure clean and healthy ambient air.	• The proponent will ensure that operations at the site do not generate dust, particulates and other emissions beyond allowable limits especially during construction by deploying efficient dust screens, PPE and other dust suppression measures.
Legal Notice No. 120, Environmental Management & Co-ordination (Water Quality) Regulations 2006	• Provides for the protection of ground & surface water resources • Provides for the parameters in the quality of wastewater discharged from any facility/activity into the environment or sewer.	• Any discharges to the surface water courses during operation phases are to be monitored for conformance with the standards. • The project proponent will fully comply with the Regulations. • The contractor/proponent will handle hazardous substances in a manner that is not likely to cause water pollution. • The proponent should ensure that effluent meets the standards set out under Schedule III of Legal Notice No. 120 of 2006.
The Environmental Management & Coordination (Controlled Substances) Regulations, 2007	• The regulations regulate the importation and use of Ozone Depleting Substances. • Regulation No. 3 gives a classification of Controlled Substances.	• The proponent will comply fully with the Regulations by not using Ozone Depleting Substances
The Environmental Management and Coordination (Conservation of	• The regulations provide for: • detailed processes and rules for the conservation	• The developer should adhere to these regulations in order to conserve the biological diversity in the

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 Legal Notice No. 160	of biological diversity in Kenya; • mechanisms to protect and prevent exploitation of endangered and threatened plant and animal species; • access to and the fair and equitable sharing of benefits arising from the utilization of genetic resources; • the consultation of local communities in the process of accessing genetic resources for research, commercial and other purposes; • Ensure recognition of specific knowledge held by and role of local communities in conservation of biological resources; • Regulate the process and terms by which genetic resources can be taken out of the republic of Kenya and, sustainable use of biodiversity and genetic resources.	area
Legal Notice No. 31, Environmental Management and Coordination, (Noise and Excessive Vibration Pollution) Regulations 2010	• Prohibits the generation of unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others & the environment. • Provides for the maximum noise levels permissible in various environmental setups such as residential areas, places of worship, commercial areas & mixed residential	• Sound level limits of 60dB(day) and 35dB (night) to be observed during operations • License to emit noise/vibrations more than permissible levels to be acquired if necessary. • The proponent will be required to comply fully with the Regulations. • The contractor shall be required to implement these measures and ensure that all machinery is in

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	• Provides that a sound source creates or is likely to emit noise or excessive vibrations or otherwise fail to comply with the provision of these regulations, a license is required.	good working condition to reduce noise. Also, construction activities shall be restricted between 0800Hrs-1700Hrs to ensure that the neighbours are not disturbed.
Environmental (Impact Assessment & Audit) Regulations, 2003	• Provides for the procedure for carrying out the ESIA Provides for the contents of an ESIA study report	• The ESIA is to be carried out in accordance with the regulations
EMCA (Fossil Fuel Emission Control) Regulation, 2006	• NEMA is mandated under this regulation to approve any substance to be used as a fuel catalyst if the substance improves fuel economy, enhances combustion and reduces harmful emissions that adversely affect human, animal and plant health and degrade the environment. Furthermore, NEMA has to issue a catalyst license of an approved fuel catalyst and may impose such conditions as it may deem appropriate.	• Only approved substances are to be used as a fuel catalyst if the substance improves fuel economy, enhances combustion and reduces harmful emissions that adversely affect human, animal and plant health and degrade the environment
Use of Poisonous Substances Act Cap 247	• An Act of Parliament to provide for the protection of persons against risks of poisoning by certain substances, and for matters incidental thereto and connected therewith	• Section 3 of the Act casts a duty of all employers to protect their employees against the risk of poisoning by poisonous substances.
The Water Act (Act No.8 of 2002) revised in 2016	• Provides that a permit shall be required for any use of water from a resource, especially where there is abstraction and use of water with the employment of works.	• Use of water abstracted from the natural spring requires an abstraction permit. • In the event the proponent considers sinking a borehole to supplement water demands, A permit

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	• The legislation provides for the management of water resources at the national and county levels. • Article 40(4) provides an application for a permit to which shall be subject to public consultation and, where applicable EIA in accordance with the requirements of the EMCA. 108(1) sewage & effluent management to avoid environmental pollution.	will be required from WRA for any construction works and an abstraction license • The proponent will comply fully with the Act.
Water Resources Management Rules 2007	• Provides for application by all those intending to abstract groundwater • Provides that where any borehole or well is intended to be equipped with a motorized pump the application shall be accompanied by a hydrogeological assessment report.	• Depending on the proposed source of water for construction activities, permits may be required
The Forests Act (Chapter 375)	• The Forest Act, Cap 385 of 1962 (revised 1982, 1992 and 2005) addresses the preservation, protection, management, enforcement and utilization of forests and forest resources on Government land. The Forest Act applies to gazetted forest areas (Forest Reserves) and specifically covers: • Gazettement, alteration of boundaries and de-gazettement of Forest Reserves (Section 4); • Declaration of Nature Reserves within Forest Reserves and regulation of activities within Nature	• The project area is not located in a forest zone. However, the developer will need a KFS permit to cut down existing trees. The developer should plant more trees on the site after completion of the project.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	Reserves (Section 5); • Issuance of licenses for activities within Forest Reserves (Section 7); • Prohibition of activities in Forest Reserves (removal of forest produce, grazing, cultivation, hunting, etc.) and on unalienated Government land (removal of trees, collection of honey, lighting of fires) except under license from the Director of Forest Services (Section 8); • Power of the Minister to make rules concerning sale and disposal of forest products, use and occupation of land, licensing and entry into forests (Section 15). This prerogative has been taken with the Forests (General) Rules, which sets forth rules for sale of forest produce and specifies royalty rates for these products.	
Physical and Land Use Planning Act. No.13 of 2019	• An Act of Parliament to provide for the preparation and implementation of physical development plans and for connected purposes. Provides for zoning areas	• The proposed project requires approval by the county physical planning department. • Provisions of the Act regarding development control shall be strictly adhered to. All developers within the project area must strictly adhere to requirements of the Act regarding plot coverage and reservation of land for public utilities
Public Health Act (Cap. 242)	• The act makes it the duty of every local authority	• Health issues will be integrated into the project to

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	(in the capacity of "health" authority) to take all lawful, necessary and reasonably practicable measures to safeguard and promote public health (s.13). • Part IX of the act deals with sanitation and housing and is of most significance for the control of polluting discharges. • Section116 imposes a duty on every local authority to maintain its district in a clean and sanitary condition, to prevent nuisances and to prosecute those responsible for nuisances. Nuisances include drains and sewers for the discharge of pollutants into watercourses and lakes. • The Public Health (Drainage and Latrine) Rules made under s.126 of the Act, make more specific provisions for drainage. The Rules require the drainage of new buildings; • Prohibit the drainage of surface water into foul water sewers; • Prohibit the discharge into sewers of matter which may interface with the free flow of the sewage or injure the sewer; • Empower the local authority to prohibit the discharge of injurious matter into sewers; • Impose a requirement for permits to be obtained	ensure environmental health is appropriately addressed. All stakeholders must undertake to comply with the provisions of the regulations by ensuring that the necessary plans to achieve the requirements of the regulations are put in place. Measures to mitigate all forms of nuisance in compliance with Part IX Sections 115 and 118 of the Act will be put in place throughout the phases of projects under the programmes Contractors will also manage solid waste arising from programme-related activities in compliance with provisions of this Act.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	from the local authority before the making of sewer connections or the construction of sewage treatment works.	
Penal Code Act (Cap. 63)	• Chapter XVII on "Nuisances and offences against health and convenience" contained in the penal code strictly prohibits the release of foul air into the environment which affects the health of the persons. • It states "Any person who voluntarily vitiates the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighbourhood or passing along a public way is guilty of a misdemeanour"	• Waste disposal and other project-related activities shall be carried out in such a manner as to conform to the provisions of the code. It is the responsibility of the contracted licensed waste handler to ensure that all kinds of waste are disposed of appropriately as per the legal provisions. • The proponent will comply fully with the Act.
The Workmen's Injury and Benefits Act, 2007	• This Act provides for compensation to employees for work-related injuries and diseases contracted in the course of their employment and for connected purposes. • Key sections of the Act include the obligations of employers; right to compensation; reporting of accidents; compensation; occupational diseases; medical aid; appeals; and miscellaneous provisions.	• The proponent will comply fully with the Act.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	• Schedules provided in the Act outline the degree of disablement; occupational diseases; and dependant's compensation. • In case of any accidents or incidents during the project cycle, this Act will guide the course of action to be taken.	
The Employment Act, 2007	• This Act declares and defines the fundamental rights of employees; minimum terms and conditions of employment; provides basic conditions of employment of employees; and regulates the employment of children, among other rights. • Key sections of the Act elaborate on the employment relationship; protection of wages; rights and duties in employment; termination and dismissal and protection of children, among others.	• The contractor is to be strictly advised not to engage any underage persons (under 18 years of age) to perform any form of work at the site during construction. • The proponent shall also ensure that the contractor is conversant and adheres to all the provisions of the Employment Act
The Traffic Act, Cap 203	• This Act consolidates the law relating to traffic on roads. • Key sections include registration and licensing of vehicles; driving licenses; driving and other offences relating to the use of vehicles on roads; regulation of traffic; accidents; offences by drivers of vehicles other than motor vehicles and other road users; and miscellaneous provisions as to	• Vehicles will be used to transport humans and equipment during the entire project life, and their registration and licensing will be required to follow the above Act.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	roads, among others.	
The Standards Act Cap 496	• This Act promotes the standardization of the specification of commodities, and provides for the standardization of commodities and codes of practice to ensure public health and safety.	• This means the Proponent has to ensure all materials and equipment in use during construction as well as operation of the facility adhere to the highest standards and do not pose any human health and safety risk. • The proponent will comply fully with the Act.
Occupational Safety and Health Act 2007 (CAP 15)	• This Act promotes and guarantees the protection and wellbeing of workers in the workplace. • Provides that every occupier shall ensure the safety, health & welfare at work of all persons working in this workplace. • Provides for registration of premises before use as a workplace • Provides that workplace shall be of sufficient size for work to be carried out with ease & an adequate amount of air for each employee, the minimum permissible being 10m3 per person. • Provides that an occupier shall ensure that effective & suitable provision is made for securing & maintaining by circulation of fresh air in each workroom, the adequate ventilation of the room. • Provides that an occupier ensures effective	• Work at the proposed site may involve hazards such as accidental falls, working at heights, exposure to energized circuits and heavy equipment etc. • Other potential sources of occupational injuries include entry into confined spaces, including manholes and dust generation associated with construction activities among others. • The contractor will continuously improve the safety and health standards at the construction site making safety concerns everyone's responsibility. • Emergency response plan, warning signs, machinery safety and construction safety provisions of the Act which are aimed at managing occupational accidents, incidents and injuries at the workplace will be put in place.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	provision is made for securing & maintaining sufficient & suitable lighting, whether natural or artificial, in every part of this workplace in which persons are working or passing. • Provides that sufficient & suitable sanitary conveniences for the persons employed in the workplace shall be provided, maintained & kept clean, and effective provision shall be made for lighting the convenience; and where persons of both sexes are or are intended to be employed (except in the case of workplaces where the only persons employed are a member of the same family dwelling there) such conveniences shall afford proper separate accommodation for persons of each sex. • Provides that all plant, machinery & equipment whether fixed or mobile for use either at a workplace or as a workplace, shall only be used for work for which they are designed for & be operated by a competent person.	• All requisite training, approval and permits including Workplace Registration Certificate shall be procured by the proponent/contractor
Factories & Other Places of Work (Noise Prevention & Control Rules,2005	• Rules provide for the maximum noise exposure levels for workers in places of work & for the provision of protective equipment for those exposed to high noise levels.	• Noise emitted during the operation of the Housing units and commercial premises in the development requires provision of PPE to workers & minimization of noise exposure to the public

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	• Provides that an occupier shall institute noise reduction measures at the source of the noise in the workplace	
Electricity Power Act No. 11 of 1997	• The Act establishes the Energy & Petroleum Regulatory Authority (EPRA) with a mandate for the management of energy issues in Kenya. • Part III of this Act is dedicated to Electricity energy. Section 30 of this part stipulates that any electrical installation work should be conducted by such a person as one licensed by the ERC as an electrician or an electrical contractor.	• Electricity power installation and usage should be done in a manner that seeks to protect the health and safety of the project employees; the local and other potentially affected communities as well as the environment. • Electrical installation will be done by a licensed electrician under EPRA. • Liaison with relevant agencies such as KPLC should be sought where necessary. • The proponent should adhere to the provisions of this Act in all phases of the project.
The Energy Act 2019	• The Act consolidates the laws relating to energy & provides for National & county government functions about energy. • Provides for promotion of renewable energy; exploration, recovery & commercial utilisation of geothermal energy; regulation of midstream & downstream petroleum & coal activities; regulation, production, supply & use of electricity & other energy forms;	• The project proponent will comply with Legal Notices 43 & 102 to ensure conformity with the Energy Act provisions. • The proponent will be required to address provisions raised in the Energy (solar water heating) Regulations 2012

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	• Enforcement & review of environmental, health, safety & quality standards.	
Legal Notice No. 60: Hazardous Substances Rules, 2007	• The Rules state that the Proponent shall ensure that where chemicals come into contact with employees, the exposure limits set out in the First Schedule of the Regulations are not exceeded. • Where employees may be exposed to two or more chemicals in the workplace the Proponent shall work out the combined exposure using the narrative given in the Second Schedule of the Regulations.	• The proponent will comply fully with the Regulations.
Land Act, 2012 (Act no.6 of 2012)	• Provides for the sustainable administration & management of land & land-based resources & connected purposes. • The Act also provides for the repeal of the Way Leaves Act (Cap 292) and the Land Acquisition Act (Cap 295)	• The proposed project site is registered & has a title deed
The Land Planning Act (Cap 303) Land Titles Act, Cap 282 Registration of Titles Act, Cap 281 Registered Land Act, Cap 300	• The Land Planning Act (Cap 303) • Section 9 of the subsidiary legislation (the Development and Use of Land Regulations 1961) requires that before the local Authority submits any plans to the minister for approval, steps should be	• The proponent will be required to comply fully with these Acts

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	taken as may be necessary to acquire the owners of any land affected by such • plans. Particulars of comments and objections made by the landowners should be submitted, which intends to reduce conflict of interest with other socio-economic activities. • Land Titles Act, Cap 282: this Act makes provision for the removal of doubts that have arisen in regard to titles to land and to establish a Land Registration Court. Specific provisions include guidelines on the adjudication of claims and registration of documents after the certificate of ownership is granted. • Registration of Titles Act, Cap 281: this Act provides for the transfer of land by registration of titles. Parts within the Act elaborate on mechanisms of bringing lands under the Act, grants, transfers and transmissions of land, registration of titles, and mode and effect of registration, transfers, leases, charges, powers of Attorney, and rectification of titles, among others. • Registered Land Act, Cap 300: The Act provides for the registration of title to land and provides for the regulation of dealings in land so registered, and for purposes connected therewith.	

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	• The Act elaborates on the organization and administration of the Act, the effect of registration, title deeds, certificates of lease and searches, instruments and agents, transmissions and trusts, restraints on disposition, rectification and indemnity, and decisions of registrars and appeals.	
The Environment and Land Court Act, 2011	• The Act establishes a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. • The act states that it's an offence for any person who refuses, fails or neglects to obey an order or direction of the Court given under this Act, commits an offence, and shall, on conviction, be liable to a fine not exceeding twenty million shillings or to imprisonment for a term not exceeding two years, or to both	• The project proponent will abide to all the provisions of this Act
National Construction Authority Act No. 41 of 2011	• An Act of Parliament to provide for the registration of contractors operating or willing to undertake construction operations in Kenya as by law through the National Construction Authority (NCA), which is constituted under Act No. 41 of 2011	• The proponent will comply with the Act by ensuring that the site and project contractors are registered and certified by NCA.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	Laws of Kenya. • Section 15 of this Act demands registration of contractors with NCA while sections 17 and 18 outline the procedure of registration of contractors.	
The Valuers Act Chapter 532	• An Act of Parliament to provide for the registration of valuers and for connected purposes. • (1) of the Act establishes the Valuers Registration Board, whose responsibility is to regulate the activities and conduct of registered valuers in accordance with the provisions of this Act.	• The project proponent will be required by law to engage the services of only a registered valuer.
Sessional Paper, No. 1 of 2017 on National Land Use Policy	• The principal objective of the NLUP is to provide a legal, administrative, institutional and technological framework for optimal utilization and productivity of land and land-related resources in a sustainable and desirable manner at National, County and Sub- County and other local levels. • The Policy offers a framework of recommendations and principles designed to ensure the maintenance of a land use system that will provide for: ▪ Land use planning, resource allocation and resource management for sustainable development to promote public good and general	• This Policy incorporates measures and principles to guide all activities, whether proposed or ongoing, that may have a direct or indirect impact on the use of land and its resources. • The Policy takes cognizance of the benefits of planned use of land and its resources; and builds in measures for integrated, equitable and sustainable utilization for optimal production. • This Policy upholds the values of economic productivity, environmental sustainability and the conservation of culture; and seeks to facilitate their protection and optimal use.

Relevant National Legislations, Regulations, Ministerial & County Institutional Integration	Description	Relevance
	welfare; ▪ Environmental management and sustainable production in the utilization of land resources; ▪ Coordination and integration of institutional linkages in planning at sectoral and cross-sectoral levels to foster collaboration and decision-making among different land users; ▪ Equitable utilization of land resources to meet governance, social economic and cultural obligations of the people of Kenya; ▪ Anchoring land development initiatives that will respond positively to the market demands; ▪ A comprehensive and efficient GIS-based national land use information management system; ▪ An appropriate, independent, accountable and democratic institution for land use conflict resolution; and • Mitigating problems associated with poor land use.	
County Government by-laws	• Prescribes the necessary easements required for the establishment of any project within the County.	• Ensure adherence to the by-laws provisions and acquire the necessary approvals and permits

5.4 International Environmental Management Agreements/ Conventions and Protocols

The relevant International Environmental Management Agreement(s) are summarised in the table 6 below:

Table 6: Relevant International Environmental Management Agreement(s)

International Environmental Management Agreement(s)	Description	Relevance
The United Nations Declaration on the Rights of Indigenous Communities	The Declaration is the most comprehensive international instrument on the rights of Indigenous peoples. It establishes a universal framework of minimum standards for the survival, dignity and well-being of the Indigenous peoples of the world and it elaborates on existing human rights standards and fundamental freedoms as they apply to Indigenous peoples.	The provisions of The United Nations Declaration on the Rights of Indigenous Communities should be put into consideration by the developer, in that the developer should engage the indigenous communities throughout the project cycle.
The Rio Declaration- Agenda 21	Principle 4 of the Rio Declaration provides that in order to achieve sustainable development environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. Principle 25 accentuates this by stating that peace, development and environmental protection are interdependent and indivisible.	The provisions of Rio Declaration should be put into consideration by the developer, in that protect the environment while still sustainably developing.
World Commission on Environment and Development of 1987	The mission of the Brundtland Commission is to unite countries to pursue sustainable development together. The Brundtland Commission insists upon the environment being something beyond physicality, going beyond that traditional school of thought to include social and political atmospheres and circumstances. It also insists that development is not just about how poor countries can ameliorate their situation, but what the entire world, including developed countries, can do to ameliorate our common situation.	The provisions of this convention should be taken into consideration by the developer.
The Ramsar Convention on Convention on Wetlands of	The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat is an international treaty for the	The developer should ensure the proposed project doesn't have any impact on wetlands.

International Environmental Management Agreement(s)	Description	Relevance
International Importance especially as Waterfowl Habitat	conservation and sustainable use of wetlands. It is also known as the Convention on Wetlands. It is named after the city of Ramsar in Iran, where the Convention was signed in 1971. Every three years, representatives of the Contracting Parties meet as the Conference of the Contracting Parties (COP), the policy-making organ of the Convention which adopts decisions (Resolutions and Recommendations) to administer the work of the Convention and improve the way in which the Parties are able to implement its objectives.	Wastes should properly be disposed and not directed into water bodies.
Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (Basel Convention)	Is an international treaty that was designed to reduce the movements of hazardous waste between nations, and specifically to prevent the transfer of hazardous waste from developed to less developed countries (LDCs). The Convention is also intended to minimize the amount and toxicity of wastes generated, to ensure their environmentally sound management as closely as possible to the source of generation, and to assist LDCs in environmentally sound management of the hazardous and other wastes they generate.	The developer should minimize the amount and toxicity of wastes generated, to ensure their environmentally sound management as close as possible to the source of generation
United Nations Framework Convention on Climate Change UNFCCC (1993)	The UNFCCC objective is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The framework sets non-binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to specify further action towards the objective of the UNFCCC.	The Belle Veu Arc mixed use development project will endeavour to be in line with this convention and ensure that atmospheric pollution through greenhouse gases are minimised as is practically possible.

International Environmental Management Agreement(s)	Description	Relevance
Rotterdam (PIC) Convention on Prior Informed Consent	The Rotterdam Convention (formally, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade) is a multilateral treaty to promote shared responsibilities in relation to importation of hazardous chemicals. The convention promotes open exchange of information and calls on exporters of hazardous chemicals to use proper labeling, include directions on safe handling, and inform purchasers of any known restrictions or bans.	The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure. It built on the voluntary PIC procedure, initiated by UNEP and FAO in 1989 and ceased on 24 February 2006. The Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by Parties and which have been notified by Parties for inclusion in the PIC procedure.
Stockholm Convention on Persistent Organic Pollutants (POPs) (2002)	The Stockholm Convention on Persistent Organic Pollutants is a multilateral treaty to protect human health and the environment from chemicals, known as POPs. POPs have harmful impacts on human health or on the environment. They remain intact in the environment for long periods, become widely distributed geographically and accumulate in the fatty tissue of humans and wildlife.	The developer should ensure that all POPs are properly disposed in order to protect the environment.
UNCCD: Convention on Desertification, of January 1995	The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (UNCCD) is a Convention to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.	Soil conservation measures should be put in place throughout project implementation period.
World Heritage Convention:	For the purpose of this Convention, international protection of the	The Convention Concerning the Protection of

International Environmental Management Agreement(s)	Description	Relevance
Convention concerning the protection of the world cultural and natural heritage	world cultural and natural heritage shall be understood to mean the establishment of a system of international co-operation and assistance designed to support States Parties to the Convention in their efforts to conserve and identify that heritage.	the World Cultural and Natural Heritage (the World Heritage Convention) is a successful global instrument for the protection of cultural and natural heritage.
Montreal Protocol: Protocol for the Protection of the Ozone Layer January 1990	The Montreal Protocol is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.	The developer is required to use only materials and substances that are safe and won't lead to the depletion of the Ozone layer.
Sofia Protocol to LRTAP concerning the Control of Emissions of Nitrogen Oxides or their Trans-boundary Fluxes (NOx Protocol)	Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Nitrogen Oxides or Their Transboundary Fluxes, opened for signature on 31 October 1988 and entered into force on 14 February 1991, was to provide for the control or reduction of nitrogen oxides and their transboundary fluxes.	The proponent is requested to introduce pollution control measures based on best available technologies that are economically feasible.

6 ANTICIPATED ENVIRONMENTAL IMPACTS

6.1 Positive impacts

Potential positive impacts from the proposed redevelopment will be both short term and long term. This will include but not limited to the following:

6.1.1 Construction and operation of an Emulsion Paint Binder Factory and Plastic Injection Moulding Plant

An Emulsion Paint Binder Factory and Plastic Injection Moulding Plant will be constructed and operated.

6.1.2 Employment opportunities

During the construction phase, job opportunities to both skilled and casual workers will be available. Several workers including casual labourers, masons, carpenters, joiners, electricians and plumbers are expected to work on the project site from the project start period to its completion date. Apart from casual labour, semi-skilled and unskilled labour and formal employees are equally expected to obtain gainful employment opportunities during the project construction phase. Employment opportunities are one of the long-term major impacts of the proposed development that will be realized after the construction phase and during the operation and maintenance of the facility.

6.1.3 Development of local infrastructure

The implementation of the proposed project will lead to opening up the area by adding more residential space that ensures optimal land use as compared to the current use or any perceived future use of the said plot.

6.1.4 Revenue to government

There will be gains in the local and national economy. Through consumption of locally available building materials including concrete tiles, timber and cement. The consumption of these materials, fuel oil and others will attract taxes including VAT which will be payable to the government.

6.1.5 Enhancement of other businesses

The proposed project will improve income/economic status of people within the project neighbourhood. There will be gains in the local and national economy. Through consumption of locally available building materials including concrete tiles, timber and cement. The cost of the materials will be payable directly to the producers.

6.1.6 Improved security in the area

This is going to be realised through employment of security guards both during construction and operational stages of the proposed project. Lighting of the project area and its environs will also help boost the security of the area during night hours.

6.1.7 Optimal use of land

By constructing the proposed factories, land use will be optimised and value of adjoining property is likely to appreciate.

6.2 Negative Impacts and Potential Mitigation Measures

6.2.1 Climate change and Green House Gases generation

The proposed project is likely to have on Climate change through Green House Gases generation

Potential mitigation measures include:

1. Use LPG fired generators
2. Electric vehicles and machinery will be used
3. Install Solar Photovoltaic System
4. Plant and maintain a greenbelt around the facility

6.2.2 Site security and security of construction materials & equipment

On a construction site, the security of the site and the security of the building materials and equipment is a major concern.

Potential mitigation measures include:

5. Installation of security lighting
6. Round the clock security manning of the construction site
7. Construction of secure material and equipment stores on the site
8. Construction materials to be delivered in small quantities to minimize storage problems
9. Installation of CCTV

6.2.3 Construction material extraction & use

Construction material extraction and use can have negative impacts.

Potential mitigation measures include:

1. Availability and sustainability of the materials extraction sites as they are non-renewable in the short term
2. Source building materials from certified suppliers

6.2.4 Light Pollution

The project site is adjacent to wildlife conservancies, direct light sources which are visible from the exterior of the facility is likely to cause light pollution which can affect wildlife from nearby conservancies.

Potential mitigation measures include:

1. No direct light sources will be visible from the exterior of the buildings to minimize light pollution which can affect wildlife from nearby conservancies.

6.2.5 Solid waste generation

Solid waste will consist of construction debris, cement bags, wood, broken glasses, containers, metal, sharp objects such as nails, organic waste, paper, and plastic among others during the development construction phase.

Potential mitigation measures include:

1. Comply with EMCA Waste Management Regulations 2006
2. Ensure waste materials are disposed of on NEMA and County Government approved sites
3. Ensure re-use of materials that can be re-used
4. Use of the 3rs – Reduce, Re-use, Re-cycle
5. Efficient use of building material to reduce waste and recycling/reuse where feasible
6. Provision for waste management receptacles / bins at strategic places within the site
7. Segregation of waste at the source during the project cycle.
8. Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options: source reduction, recycling, composting and reuse, will facilitate waste handling during operation/occupation phase.
9. A NEMA and County Government certified waste management firm to be commissioned to provide waste collection and disposal services.
10. Ensure waste materials are disposed of on NEMA and County Government approved dumpsites.
11. Ensure re-use of materials that can be re-used – where feasible implement se of the 3RS – Reduce, Re-use, Re-cycle

6.2.6 Air pollution, particulate matter & dust emission

Air pollution will be among the major negative impact during the site preparation and construction phase as a result of increase in amounts of dust emanating from the demolition, excavation, construction activities and stockpiled earth materials. Air pollution may also be as a result of emission of fumes and particles or combustion of fossil fuels from the construction machinery.

The expected air pollutants from the proposed project will include dust, particulate matter and gaseous emissions from construction materials and equipment. Dust will be generated from the excavations and materials delivery. Particulate matter will be generated from dry materials including sand, cement, gravel, etc. Smoke, hydrocarbons and nitrogenous gases will be emitted from machinery exhausts. These will be expected to increase slightly and will be localized hence expected to be experienced within 30m radius of the project. Air pollution is expected to be experienced during construction period.

Potential mitigation measures include:

1. Carry out baseline air quality survey
2. Regular spraying of stockpiles of earth and dusty area with water
3. Avoid pouring dust materials from elevated areas to ground

4. Cover all trucks hauling soil, sand and other loose materials
5. Provide dust screen where necessary Sensitize workforce including drivers of construction vehicles
6. Ensure no burning of waste such as paper and plastic containers on sites/non-designated areas.
7. Minimize exposed areas through the schedule of construction activities to enable dust control.
8. Minimize the period for idling of machinery and construction vehicles.
9. Monitor the air pollution levels regularly as per the Air Quality regulations.
10. Onsite dirt piles or other stockpiled material should be covered, wind breaks installed, water and/or soil stabilizers employed to reduce wind-blown dust emissions.
11. All staff employed at the construction site and visitors must be provided with dust masks and other PPEs.
12. All waste must be transported off-site for processing, not burnt or stored for any longer than is absolutely necessary.
13. Machines must not be left idling for unnecessary periods of time.
14. Alternatively, fuelled construction equipment shall be used where feasible
15. All raw materials where possible must be sourced as close as possible to the construction site thus reducing the emissions from vehicular traffic.
16. Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases.
17. Regular sprinkling of water on work areas to prevent fugitive dust violations.
18. Restricting heights from which materials are to be dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading.
19. Use environmentally friendly fuels such as low sulphur diesel.
20. Buffer area of trees and other vegetation will serve as natural windbreaks.
21. Use of dust nets/screens around the construction site to contain and arrest dust.
22. Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials will not leak from the vehicle.

6.2.7 Sewerage & wastewater management

There will be increase generation in liquid waste as a result of increase in population within the project site both during construction and operation phases of the development.

Potential mitigation measures include:

1. Comply with EMCA Water Quality Regulations, 2006
2. Carry out a sanitation need analysis for the proposed development
3. All drainpipes passing under buildings should be of heavy-duty PVC pipe tube encased in concrete surround.
4. All manholes should have heavy-duty covers set and double sealed airtight as approved by specialists.
5. Proper decommissioning of temporary sanitary facilities shall be carried out once construction is complete.
6. Provision of adequate and appropriate sanitary facilities for the workers during construction phase and tenants during the operation phase of the facility.

7. Use onsite wastewater treatment plant.
8. Sanitary facilities shall be kept clean always through regular cleaning.
9. Servicing of machinery and equipment's to be done at a designated place with a paved surface and oil interceptors

6.2.8 Site excavation leading to site disturbance

Site excavation to pave way for the construction of the proposed building will lead to the disturbance of the site.

Potential mitigation measures include:

1. A section of the proposed project site has been excavated in preparation of an access road
2. Excavate only areas to be affected by buildings
3. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services
4. Dumping of excavated materials to sites approved by NEMA and the county government
5. Landscaping and restoration of excavated sites

6.2.9 Socio-economic impacts potential mitigation measures

Social & neighbourhood effects from the housing project are a function of land use, development & economic impact of development intervention.

6.2.9.1 Neighbourhood effects

- Neighbourhoods surrounding the Project site
- Future of project without the development
- Population demographics
- Special population groups
- Barriers to social interactions (physical or perceived)
- Access to neighbourhood & services
- Loss of residences or facilities & services (relocation)
- Changes in property value

6.2.9.2 Community facilities & Services

- Educational facilities
- Religious facilities & cemeteries
- Fire, police & emergency service facilities
- Health care (hospitals, nursing homes etc.
- Parklands & recreational land
- Civil building & services
- Cultural facilities (museums, libraries, theatres)

6.2.9.3 Negative Social Impacts

The proposed development may have negative socio-economic impacts to the local residents / people, these may include public safety and health effects; air and noise pollution, etc

Potential mitigation measures include:

1. Persons from the nearby communities should be employed to work on the construction site.
2. Designate the roles and responsibilities of workers, which will enable a clear chain of command in the event of an accident and allows persons to be aware of their responsibilities in the event of such occurrences.
3. Place several fully equipped first aid kits on the project sites-.
4. Ensure that some workers are trained in basic first aid practices.
5. Signs must also be placed around the construction site displaying the numbers of the person responsible for handling emergencies on the site
6. Develop and implement a Health and Safety Training Manual for employees;
7. Identify a specific area on the project site for vending type activities
8. Purchase goods and supplies from suppliers within the area

6.2.10 Increased traffic & road safety concerns

Increased road traffic in and out of project site will be experience during all the phase of the project. Traffic increase is anticipated both from vehicular & non-motorised sources.

Potential mitigation measures include:

1. Implement recommendations of the traffic management plan
2. Erect appropriate road safety signage
3. Deploying adequate number of traffic marshals
4. Provide adequate construction parking spaces within the project site
5. Provide incentives for facility users to prioritize public and non-motorized transport modes
6. Enforce speed limits for construction vehicles
7. Proper road safety signage.
8. Road safety awareness creation.
9. Provide adequate parking facilities within the project site.

6.2.11 Noise pollution & excessive vibrations

Noise pollution during construction will be as a result of use of heavy machinery and vehicles during transportation of materials to and from the site. Vibrations will be experienced during the concrete vibration during concreting of the structural elements and hacking of the walls and building elements during plastering of the structure.

Potential mitigation measures include:

1. Carryout baseline noise survey and regular monitoring of noise levels.

2. Comply with EMCA Noise Pollution & Excessive Vibration Regulations, 2009.
3. Ensure use of well serviced equipment.
4. Avoid idling of engines and machines when not in use.
5. Construction work to be confined to between 8am to 5pm
6. Ensure use of earmuffs and earplugs by machine operators and workers in noisy areas
7. All machines and equipment shall be maintained regularly to reduce frictional noise.
8. All noisy activities shall be scheduled concurrently during the construction period to reduce the exposure period to the PAPs.
9. All workers shall be trained and provided with PPEs such as helmets, earmuffs, dust mask, etc. which will always be used when operating within the site area.
10. Billboard shall be erected at the construction site entrance to notify of the construction activities and timings.
11. Drivers delivering materials shall avoid unnecessary horning of the trucks/vehicles.
12. Equipment installed with noise abatement devices shall be used as much as practicable.
13. Noise shields shall be used on noisy equipment, such as corrugated iron sheet structures, to minimize the exposure to the neighbours and other workers within the site
14. Regular monitoring of noise levels at the site as per the regulations.
15. The construction vehicles and machinery shall be switched off when not in use to reduce idling time.
16. Install portable barriers to shield compressors and other small stationary equipment where necessary
17. Silenced machinery and instruments should be employed to reduce the impact of noise on the existing neighbours and workers.
18. Equipment such as drills, graders and cement mixers should also be used when the least number of neighbours can be expected to be affected
19. Those working with machinery, vehicles and instruments that emit high levels of noise should be provided with ear plugs and earmuffs

6.2.12 Increased water demand & consumption

The demand and usage for water will increase during the project cycle. During construction, water will be required for activities such as cement mixing, curing of concrete, sprinkling of water on dusty areas to suppress dust and drinking water for workers. During operation phase, water will be needed for bathing, washing, cleaning, drinking and cooking. This will place strain on the existing water supply.

Potential mitigation measures include:

1. Undertake water needs analysis for the project.
2. Verify the legal status and the yield of the existing borehole on the proposed project site.
3. Set up water reservoirs to buffer against erratic supplies & reduce competition for resource with other users
4. The contractor to source water for construction from WRA approved sources
5. Drill a legal borehole to provide water for domestic use.
6. Prompt detect and repair of all the water fixtures and fittings to reduce water wastage.
7. Provide notices and information signs to sensitize on means and needs to conserve water resource i.e., “Keep/Leave the Tap Closed”, etc. This will awaken the civic consciousness of the workers and residents with regard to water usage and management.

8. Provision of adequate underground and roof tanks for water storage that covers two days' water demand.
9. The contractor shall use water bowsers and tankers to bring in water for construction activities i.e., during periods of high-water demand (i.e., during slab formation). Water fetching shall however be subject to authorization by the relevant authority.
10. Use water efficient appliances and fixtures for conservation of water during the project cycle.

6.2.13 Increased energy demand & consumption

The proposed project will lead to increased demand and use of energy during the construction stage (fuel for running machinery and other equipment) and during operation phase (electricity used by the occupants of the units).

Potential mitigation measures include:

1. Carry out energy needs analysis for the project
2. Exterior lights shall be controlled by a programmable timer.
3. Generator should be provided as a full backup energy source throughout the development.
4. Install and routine maintenance of energy efficient appliances e.g., LED bulbs etc.
5. Monitor energy use during construction and set reasonable limit.
6. Put off all lights immediately when not in use or are not needed.
7. Turn off machinery and equipment when not in use.
8. Use of solar energy as an alternative source of energy.

6.2.14 Increased surface run-off & storm water

The proposed project construction phase will lead to increased release of sediments into the drainage systems. The building roofs and pavements may lead to increased volume and velocity of storm water or run-off flowing across the area covered by the building. This can lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems.

Potential mitigation measures include:

1. Rainwater harvesting
2. Provision of enough green spaces for water percolation
3. After completion of construction, the proponent shall embark on comprehensive landscaping.
4. Construct gently sloping drains to convey water at non-erosive speed.
5. Drainage channels shall be covered; say with gratings, to avoid occurrence of accidents and entry of dirt.
6. Semi permeable materials will be used for construction of pavements.

6.2.15 Emergence & spread of social vices

The proposed development will lead to potential for employment opportunities and access to new services which will draw people to the area more specifically the project site. This factor will further lead to a temporary increase in economic activities and employment of skills for the development. This will lead to population influx which might lead to changes in or unwanted behaviours in the area. This unwanted or change in behaviour

may be in the form of loose morality, an increase in school drop-out due to cheap labour, child labour, drug use and abuse, theft/robbery and increased incidences of HIV/AIDS and related infections/diseases and other communicable diseases.

Potential mitigation measures include: in order to minimize project effects on local social set up, the proponent will;

1. Installation of security lighting in and around the project site
2. Liaise with local security system to secure the area
3. Conduct periodic sensitization forums for employees on ethics, morals, general good behaviour and the need for the project to co-exist with the neighbours.
4. Ensure enforcement of relevant legal policy on sexual harassment and abuse of office.
5. It is recommended that the contractor employs workers from the immediate area where possible to avoid social conflict
6. Offer awareness, guidance and counselling on HIV/AIDS and other STDs to employees;
7. Provide sexual awareness and provide condoms to employees

6.2.16 Public Safety & Health

During construction phase, there will be increased safety and health hazards to members of the public.

Potential mitigation measures include:

1. Comply with applicable Labour Laws e, g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007
2. Ensuring building safety and integrity /stability
3. Provide access to clean water and food to the workers and members of public
4. The contractor to abide by EIA licensing conditions
5. Hoarding / fencing of the construction site to prevent unauthorized people accessing the site
6. Staff awareness creation on safety and health issues
7. The contractor and management shall adhere to the provisions of environmental health and safety plan (EHS) for the project
8. Implement dust suppression measures
9. Enforce speed limits for trucks delivery construction materials
10. Safety signage displayed
11. Dust suppression measures
12. Deployment of traffic marshals to control movement of vehicles to and from the construction site
13. Construction works restricted between 8am and 5pm on weekdays, 8am and 2pm on Saturday.

6.2.17 Occupational Safety & Health

Waste material such as pieces of glass and nails left lying on the ground may cause injuries/accidents to the workers on site. Food for the construction workforce is usually provided by mobile individuals most of which operates without licenses. This can compromise health of the workers especially if such foodstuffs are prepared in unhygienic conditions. During construction phase, there will be increased air and noise pollution which are considered harmful to human health. The neighbours and workforce involved shall be subjected to this noise.

Potential mitigation measures include:

1. Register the construction site with Department of Occupational Safety and Health Services (DOSHS).
2. Comply with applicable Labour Laws e, g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007, etc.
3. Staff awareness creation on safety and health issues'
4. Have trained First Aiders and fully equipped First Aid box on site.
5. Provide and ensure proper use of personal protective equipment i.e. safety boots, helmet, goggles, and hand gloves.
6. The contractor and management shall adhere to developed environmental health and safety plan (EHS) for the project.
7. Protect workers from accidental falls and falling objects e.g. use of scaffolding with a safety net (sisal sacking); use of safety harnesses.
8. Implement dust suppression measures.
9. Enforce speed limits for trucks and vehicles delivering construction materials.
10. Ensuring buildings under construction are safe and meet all safety standards.
11. Proper supervision of works.
12. All workers shall use properly fitting PPEs to avoid injuries and illness which include working boots, overalls, helmets, goggles, earmuffs, masks, gloves etc.
13. Ensure proper solid waste disposal and collection facilities.
14. Ensure dustbin cubicles are protected from animals, rains and are well covered.
15. Proper management and treatment of wastewater
16. Construction activities must therefore be limited to the hours of 8:00 a.m. and 6:00 p.m.
17. Local individuals preparing food for the workers at the site shall be controlled, monitored and evaluated to ensure that food is hygienically prepared.
18. Provide adequate and functional sanitary facilities for the workers.
19. Provide appropriate signage and warnings in work areas to avoid injuries to the workers and occupants.
20. Safety awareness may be gained through regular safety meetings, safety training or personal interest in safety and health.
21. The contractor shall adapt a suitable emergence response plan to manage occurrence of anticipated hazards during construction phase.
22. Workers shall always be sensitized on social issues such as drugs, alcohol, diseases such as HIV/AIDS and STIs etc.
23. Mapping of cables and other networks utilities during construction to serve as reference maps in case of future maintenance.

7 PROJECT NEED & ANALYSIS OF ALTERNATIVES

Analysis of project alternatives of the proposed development considered three possible alternatives / options namely:

Alternative 1: NO Project" Option
Alternative 2: the "YES" alternative s
Alternative 3: Alternative project Option

7.1 The "no project" alternative

This option will mean that the project will not be undertaken. This implies that the proposed development will not be undertaken. The project site will remain undeveloped. In analysing this option, the following was considered;

1. **Technology transfer**: implementation of the proposed development will see transfer of various technologies locally. This includes design technologies for wastewater treatment and renewable energy incorporation in buildings. Therefore, the 'no project' alternative will not be favourable to this realization.
2. **Employment creation**; - the current government policy on employment and wealth creation aims at creating as many jobs as possible to meeting the ever-increasing employment demand in the country. If the 'no option project' was to be considered, then this government target may not be realized.
3. **Investor attraction; -** if the no option is considered it will not be consistent with the government aim of attracting investments in the country.
4. **Financial investment:** -The 'no' option will mean that the County government will not be paid any taxes / fees charged for development permits.

Therefore, if the no option will be pursued it is likely that we may lose more than what is to be gained if the proposed project is to be implemented.

7.2 The 'yes' project alternative

This was considered to be a viable option. This option was considered viable as opposed to the 'no option' because the yes project alternative implies that the project be implemented and once implemented there will be a number of gains that will be realised including the following;

1. Employment creation at the local level
2. Increased quality hospitality accommodation
3. Boost on investor confidence in the property market.
4. Increased revenue in the form of taxes to the government.

7.3 Alternative project options

Design alternatives for the proposed project covers traffic management options, water sources, and alternative solid waste management systems.

7.3.1 Solid Waste Management Alternatives

A lot of solid wastes will be generated from the proposed project throughout its three phases (construction, operational and decommissioning) and an Integrated Solid Waste Management System (ISWMS) is recommended for its management. The following shall be given preference in its descending order:

1. The developer shall give priority to waste reduction at source of the materials. This option will demand a solid waste management awareness programme in the management and the hotel guests/residents.
2. Secondly, Reducing, Recycling, Reuse and composting of the waste. This calls for a source separation programme to be put in place.
3. The third priority in the hierarchy of options is combustion of the wastes that are not recyclable.
4. Finally, sanitary land filling will be the last option for the developer to consider.

7.3.2 Traffic management alternatives

The success of the project is pegged on its usability and how well the design & project components fit into the aspirations and needs of the proponent and the local community, this will be achieved by implementing the recommendation of the Traffic Impact Assessment for this project.

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT & MONITORING PLAN

8.1 Introduction

The EMP is the key outcome of the Environmental and Social Impact Assessment (ESIA) process for the proposed affordable housing project. In real meaning, the ESMP is a mechanism to meet the recommended environmental and social mitigation measures. The ESMP is an instrument that will allow the proponent, developers and other key stakeholders to integrate environmental components during implementation, operation and decommissioning phases of the project.

8.1.1 Scope & Objectives of the ESMP

The Environmental Management Plan will focus on mitigating the impacts identified during the environmental and social assessment. It is an instrument that will allow developers, beneficiary communities and other key stakeholders to integrate environmental components during the various phases of the project. This plan is meant to establish measures and procedures to control the analysed impacts and monitor their progress. It will achieve the following in the long run:

(i) Provide the National Environment Management Authority (NEMA) with a tool to make ease the evaluation of the objectives at different phases of the project, taking into account the Kenyan environmental legislation;
(ii) Provide clear and mandatory instructions to the proponent, tenants / house owners and other key stakeholders with regard to their environmental responsibilities in all phases of project;
(iii) Ensure continuous compliance of proposed development, beneficiary communities and other key stakeholders with Kenyan legislation and policies regarding the environment;
(iv) Assure the regulators and interested and affected parties the satisfaction of their demands in relation to environmental and social performance.

8.1.2 Applicable Legislation

The developed ESMP will be in line with legislation applicable to the project. International normative instruments concerning the environment, as well as international best practice have also been considered.

8.1.3 Principles of Environmental Management Plan

The project should be implemented taking into account the need to minimize potential negative impacts and maximize its potential positive impacts on the biophysical and socio-economic environment as well as health and safety of workers and the public. This commitment must be made at various levels, from the senior management level of the proponent to the levels of all parties involved in the implementation of the project.

8.2 Recommendations/Commitments of the ESIA

The ESIA document contains a series of recommendations related to mitigation measures, monitoring and management. A key role of the ESMP is to put them all in a single framework. For each identified impact in the ESIA, the ESMP provides in a tabular format the following:

(i) A list of mitigation measures (activities) that the developer and other key stakeholders will implement in accordance with each phase and activity of the project, to ensure that the mitigation objectives are met in full;
(ii) The role and responsibility of each of the stakeholders to ensure full implementation of mitigation measures; and
(i) The timetable of implementation/monitoring activities.

8.3 Responsibility

The proponent assumes full responsibility for implementing and monitoring the required measures to mitigate or enhance the environmental impacts. The effectiveness of mitigation measures should be evaluated by the proponent and the contractor.

8.4 Environmental Awareness

The proponent will be sensitive to the needs of the environment so as not to degrade (or degrade to a minimum) the existing environmental conditions. It is the proponent's primary responsibility to ensure that all parties that are directly involved in the construction and operation phases of the project, including managers and employees are aware about the need to prevent or minimize environmental degradation. The awareness activities will be guided by the following issues:

(i) Prevention of pollution of surface water and groundwater;
(ii) Prevention of air quality degradation;
(iii) Prevention of increased noise levels;
(iv) Prevention/reduction of social and economic disruptions;
(v) Prevention of risks to health and safety of workers and the general public.

8.5 Mitigation

All activities related to the lifecycle of the project will be subjected to appropriate mitigation measures to ensure that negative impacts are properly mitigated and managed. Mitigation involves identifying the best options to be adopted to minimize or eliminate negative impacts, highlighting the benefits associated with the proposed project and the protection of public and individual rights.
Practical measures are therefore sought to reduce adverse impacts or enhance beneficial impacts of the project.

8.6 Monitoring

The key objectives of monitoring are:

(i) To ensure that the EMP is implemented;
(ii) To evaluate the effectiveness of the mitigation measures;
(iii) To verify predicted impacts;
(iv) To provide feedback to licensing authorities.

Table 7 below shows the Environmental and Social Management Plan (ESMP) for the pre and construction phases of project

Table 7: ESMP for the pre and construction phase of project

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
1.	Air pollution, particles and dust emission	1. Carryout baseline air quality and monitor the air pollution levels regularly as per the Air Quality regulations,2009 2. Regular spraying of stockpiles of earth and dusty area with water 3. Avoid pouring dust materials to the lower ground from elevated areas 4. Cover all trucks hauling soil, sand and other loose materials 5. Provide dust screen where necessary and sensitize workforce including drivers of construction vehicles on dust suppression / reduction measures 6. Ensure no burning of waste such as paper and plastic containers on the construction site 7. minimize exposed areas through the schedule of construction activities to enable dust control 8. Minimize the period for idling of machinery and construction vehicles 9. Onsite dirt piles or other stockpiled material should be covered, wind breaks installed, water and/or soil stabilizers employed to reduce wind-blown dust emissions 10. All workers at the construction site and visitors exposed to dusty conditions must be provided with dust masks and other PPEs 11. All waste must be transported off-site for processing, not burnt or stored for any longer than is absolutely necessary 12. All raw materials where possible must be sourced as close as possible to the construction site thus reducing the emissions from vehicular traffic 13. Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases 14. Use environmentally friendly fuels such as low sulphur diesel 15. Buffer area of trees and other vegetation may serve as natural windbreaks 16. Use of dust nets/screens around the construction site to contain and arrest dust 17. Institute appropriate dust suppression measures such as regular sprinkling of	Developer and Contractor	Pre and construction phase	250,000 quarterly

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		water on dusty access roads; speed limits; etc.			
2.	Site security and security of construction material and equipment	18. Installation of security lighting 19. Round the clock security manning of the construction site 20. Construction of secure material and equipment stores on the site 21. Construction materials to be delivered in small quantities to minimize storage problems 22. Installation of CCTV on the site	Contractor	Construction phase	200,000
3.	Construction material extraction & use	23. Availability and sustainability of the materials extraction sites as they are non-renewable in the short term 24. Source building materials from certified suppliers	Contractor	Construction phase	No value attached
4.	Safety and integrity of building during construction	25. Comply with the National Construction Authority Act, No. 41 of 2011 26. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007, etc 27. Use of appropriate construction materials and reinforcements as per specifications 28. Ensuring building materials and components are as per design specifications 29. Close supervision of construction works 30. Proper supervision and material testing regime 31. Ensure proper timelines are followed during construction works e.g. curing time	Contractor	Construction phase	BOQ
5.	Increased traffic flow and road safety concerns during construction	32. Formulate a traffic management plan for the proposed development approved by the county government 33. Erect adequate road safety signage 34. Encourage the use of NMT by providing convenient access to public transport 35. Encourage the use of NMT by providing convenient access to public transport 36. Designate ample parking foe construction vehicles within the project site 37. Limit vehicular speed on the Site and access roads to 10 km/h for construction vehicles and 20 km/h for light vehicles and passenger vehicles. 38. Provide adequate streetlights to provide sufficient light for both pedestrian areas	Developer and Contractor	Pre and construction phase	TBD

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		and carriage ways. 39. Drivers shall be adequately trained in the recognition and avoidance of road hazards, vehicle maintenance and safety requirements. 40. All equipment and/or materials transported to or from Site shall be appropriately secured to, or contained in, vehicles. 41. vehicles used during the Project shall have the appropriate load-bearing capacity for the materials and/or equipment intended to be transported.			
6.	Site excavation leading to site disturbance	42. Excavate only areas to be affected by buildings 43. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services 44. Dumping of excavated materials to sites approved by NEMA and the county government 45. Landscaping and restoration of excavated sites	Contractor	Construction	300,000
7.	Noise pollution and excessive vibration	46. Regular monitoring of noise levels 47. Comply with EMCA Noise Pollution & Excessive Vibration Regulations, 2009 48. Ensure use of well serviced equipment 49. Avoid idling of engines when not in use 50. Construction work to be confined to between 8am to 5pm 51. Ensure use of earmuffs and earplugs by machine operators and workers in noisy areas 52. All workers shall be trained and provided with PPEs such as helmets, earmuffs, dust mask, etc. which will always be used when operating within the site area 53. Safety signage shall be erected at the construction site entrance to notify of the construction activities and timings 54. Drivers delivering and removing materials to and from the site shall avoid unnecessary horning of the trucks/vehicles 55. Equipment installed with noise abatement devices shall be used as much as practicable 56. Noise shields shall be used on noisy equipment, such as corrugated iron sheet	Developer and Contractor	Pre and construction phase	400,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		structures, to minimize the exposure to the neighbours and other workers within the site 57. Install portable barriers to shield compressors and other small stationary equipment where necessary 58. Equipment such as drills, graders and cement mixers should also be used when the least number of neighbours can be expected to be affected			
8.	Occupational Safety and Health	59. Register the construction site with Department of Occupational Safety and Health Services (DOSHS) 60. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007,etc 61. Staff awareness creation on safety and health issues 62. Have trained First Aiders and fully equipped First Aid box on site 63. Provide and ensure proper use of personal protective equipment i.e. safety boots, helmet, goggles, and hand gloves 64. The contractor and management shall adhere to developed environmental health and safety plan (EHS) for the project 65. Protect workers from accidental falls and falling objects e.g use of scaffolding with a safety net (sisal sacking); use of safety harnesses 66. Implement dust suppression measures 67. Enforce speed limits for trucks and vehicles delivering construction materials 68. Provide First Aiders and First Aid Kits on site 69. Ensuring Building Strength and stability 70. Proper supervision of works	Contractor	Construction phase	250,000
9.	Public Safety & Health	71. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007 72. Enforce speed limits for trucks and vehicles delivering construction materials 73. Proper signage and warning to public of heavy vehicle turning 74. Ensuring Building Strength and stability	Contractor	Construction phase	100,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		75. The contractor to abide by EIA licensing conditions			
10.	Solid waste generation	76. Comply with EMCA Waste Management Regulations 2006 77. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services 78. Ensure waste materials are disposed of on NEMA and County Government approved sites 79. Ensure re-use of materials that can be re-used 80. Use of the 3rs – Reduce, Re-use, Re-cycle 81. Efficient use of building material to reduce waste and recycling/reuse where feasible 82. Provision for waste management receptacles / bins at strategic places within the site 83. Segregation of waste at the source during the project cycle 1. Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options: source reduction, recycling, composting and reuse 2. A NEMA and County Government certified waste management firm to be commissioned to provide waste collection and disposal services. 84. Ensure waste materials are disposed of on NEMA and County Government approved dumpsites	Contactor	Construction & Operational phase	TBD
11.	Sewerage & wastewater management	85. Comply with EMCA Water Quality Regulations, 2006 86. Carry out a sanitation need analysis for the proposed development 87. Provide temporary adequate and clean sanitary facilities for the workers	Contractor	Construction phase	100,000
12.	Increased water demand & usage	88. Set up water reservoirs to buffer against erratic supplies & reduce competition for resource with other users 89. The contractor to source water for construction from WRA approved sources	Developer and Contractor	Pre & construction phase	500,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		90. Use water efficient appliances and fixtures for conservation of water during the project cycle.			
13.	Increased energy demand & consumption	91. Generator should be provided as a full backup energy source throughout the development 92. Install and routine maintenance of energy efficient appliances e.g., LED bulbs etc 93. Monitor energy use during construction and set reasonable limit 94. Put off all lights immediately when not in use or are not needed 95. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate 96. Turn off machinery and equipment when not in use 97. Use of solar energy as an alternative source of energy	Developer and Contractor	Pre & construction phases	700,000
14.	Increased surface runoff & storm water	98. Rainwater harvesting 99. Provision of enough green spaces for water percolation 100. Construct gently sloping drains to convey water at non-erosive speed. 101. Drainage channels shall be covered; say with gratings, to avoid occurrence of accidents and entry of dirt. 102. Semi permeable materials will be used for construction of pavements.	Contractor / Landscape architect	Construction phase	BOQ
15.	Loss of vegetation	103. Landscape the site by planting grass and trees at all disturbed areas 104. Care for the planted trees/plants 105. Incorporate as much local plants found within the area into the final landscaping of the property	Contractor	During construction	Contractor cost BOQ
16.	Emergence and spread of social vices e,g Increase in Sexual Transmitted	106. Installation of security lighting in and around the project site 107. Liaise with local security system to secure the area 108. Use of local labour force as far practical to avoid construction of a labour camp 109. Conduct periodic sensitization forums for employees on ethics, morals, general good behaviour and the need for the project to co-exist with the neighbours 110. Ensure enforcement of relevant legal policy on sexual harassment and abuse of	Contactor	During construction	200,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
	Infections & increased local insecurity	office 111. It is recommended that the contractor employs workers from the immediate area where possible to avoid social conflict 112. Offer awareness, guidance and counselling on HIV/AIDS and other STDs to employees 113. Provide condoms to employees			
17.	Occupational Health and Safety	114. All workers shall use properly fitting PPEs to avoid injuries and illness which include working boots, overalls, helmets, goggles, earmuffs, masks, gloves etc. 115. Comply with OSHA 2007 and all other relevant regulations governing health and safety of workplaces. 116. Ensure proper solid waste disposal and collection facilities 117. Ensure dustbin cubicles are protected from animals, rains and are well covered 118. Proper handling and disposal of solid waste 119. Proper treatment of wastewater 120. Construction activities must therefore be limited to the hours of 8:00 a.m. and 5:00 p.m. 121. Local individuals preparing food for the workers at the site shall be controlled, monitored and evaluated to ensure that food is hygienically prepared. 122. Provide adequate and functional sanitary facilities for the workers. 123. Provide appropriate signage and warnings in work areas to avoid injuries to the workers and occupants. 124. Provide first aid facilities and ensure that workers are trained on emergency response such as first aid skills. 125. Safety awareness may be gained through regular safety meetings, safety training or personal interest in safety and health. 126. The contractor shall adapt a suitable emergence response plan to manage occurrence of anticipated hazards during construction phase. 127. Workers shall always be sensitized on social issues such as drugs, alcohol, diseases such as HIV/AIDS and STIs etc.	Contractor, DOSSH	Construction phase	500,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
	Loss of vegetation	128. Incorporate as much local plants found within the area into the final landscaping of the property.	Contractor/ CG	Prior to commencement of demolitions	Contractor cost

Table 8 below shows the Environmental and Social Management Plan (ESMP) for the operational phase

Table 8: ESMP for the Operational phase of project

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
	Solid Waste Generation	1. All waste containers to be labelled/ color-coded depending on waste category; 2. All waste to be handled and managed in accordance with the EMCA (Waste management) Regulations of 2006; 3. Appoint a waste handler who is licensed by NEMA and permitted by the local government to handle, transport and treat biomedical wastes at approved treatment sites using recommended treatment procedures laid down by the legal framework and respective government agencies; 4. Consider waste minimization practices; 5. Package for infectious waste should include an inner, watertight layer of metal or plastic with a leak-proof seal. Outer packaging should be of adequate strength and capacity for the specific type and volume of waste; 6. Packaging containers for sharps should be puncture-proof; 7. Segregate waste at the point of generation; 8. Transport vehicles should be dedicated to waste and the vehicle compartments carrying waste sealed. 9. Waste destined for off-site treatment facilities should be transported according to the guidelines for transport of hazardous wastes / biomedical wastes in EMCA (Waste Management) Regulations, 2006; 10. Waste should be labelled appropriately, noting the substance class, packaging symbol	Developer Contracted waste handler Kenya Hospital Association	During operation phase	500,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		(e.g. infectious waste, radioactive waste), waste category, mass / volume, place of origin within hospital, and final destination; and			
1	Increased energy demand & consumption	11. Common areas / exterior lights powered by solar 12. Generator should be provided as a full backup energy source throughout the development 13. Install and routine maintenance of energy efficient appliances e.g., LED bulbs etc 14. Conduct regular energy audits 15. Use of renewable energy sources 16. Making provision for electric charging infrastructure for e-mobility	Developer	During operation phase	TBD
2	Solid waste generation & management	17. Comply with EMCA Waste Management Regulations 2006 18. Regular inspection and maintenance of the waste disposal systems during operation phase 19. Establish a collective waste disposal and management system 20. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services	management company	During operation phase	500,000 annually
3	Sewerage & Wastewater management	21. Install and operate an onsite effluent / waste water treatment plant 22. Comply with EMCA Water Quality Regulations, 2006 23. Regular inspection and maintenance of the sewer line during the operation phase	management company	During operation phase	500,000
4	Increased loading on existing infrastructure services	24. Upgrading of existing pedestrian facilities (street lights on all pedestrian walk ways & raised zebra crossing 25. Rainwater harvesting 26. Provision of increased water storage capacity 27. Provide adequate storm water drainage system	management company	12 months	500,000
5	Increased Traffic	28. Proper signage 29. Awareness creation 30. The access road should have adequate width 31. The access point to have a dedicated lane for pedestrians	Developer , KURA, NCC	During operation phase	500,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		32. The access road should be long enough to ensure decongesting of the South Park Road. 33. The intersections to the development to have adequate traffic signage for warning, information or directional. 34. A speed limit to be set in the vicinity of the development due to the high volume of traffic that will be generated, by incorporation of road markings and speed reduction devices i.e. speed humps. 35. Street lights to provide sufficient light for both pedestrian areas and carriage ways to be maintained. 36. The pedestrian walkway should have steel bollards installed. 37. Implementation of parking silos proposal within development			
6	Storm water management	38. Rainwater harvesting 39. Provide roof gutters to collect and direct roof water to drains and storage tanks 40. Construct drains to standard specifications 41. Green spaces for percolation of water 42. Maintenance of storm water drainage system and linkage to natural drains	Developer	During operation phase	100,000
7	Insecurity	43. Guarding of sites/estates by a reputable security firm 44. Constant site patrols 45. Adequate screening of visitors to the site 46. Collaboration with the existing national and county government security machinery 47. Partnership with neighbours and police in community policing 48. The contractor shall ensure that there is adequate street lighting and a security guard within the site to help curb with issues that may arise from theft. Also installing 24hr operating CCTV surveillance, which will be monitored regularly	Proponent/ management company	Operational phase	Contract sum

9 CONCLUSION & RECOMMENDATIONS

9.1 Conclusion

The proposed development is a timely investment. With timely resourcing of environmental and social safeguards proposed herein will increase the probability of having an environmentally and socially acceptable development that meets the aspirations of the investor, the local community and the country at large.

9.2 Recommendations

i. Seek approval from County Government for clearing of the mature trees on the project site
ii. Co-design and Implement the Traffic Management Plan in consultations with KURA/ KeNHA.
iii. Fully implement the developed ESMP in conjunction with relevant stakeholders
iv. Ensure that worker's occupational health and safety standards are maintained through capacity building, proper training, providing protective clothing and equipment.
v. Annual environmental audits should be carried out on the project to ensure compliance of the project with the mitigation measures outlined in the Environmental and Social Management Plan (ESMP),
vi. All activities concerning construction and maintenance such as, work execution and site inspection shall be strictly monitored by an engineer or a designated official. Engineers and/or designated official shall be trained and experienced enough to judge the appropriateness of the work executed to carry out the monitoring properly.
vii. Upon completion and occupation, the developer / management company should engage services of waste handling companies registered by NEMA in compliance with Environment Management and Coordination (Solid Waste) Regulations 2006.

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ANNEXES

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Annex 2: Certificate of Incorporation & PIN certificate

Annex 3: Copy of Land ownership document and Approval of Change of Use

Annex 4: Summary page of the Bill of Quantities

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