ENVIRONMENTAL IMPACT ASSESSMENT PROJECT REPORT FOR THE PROPOSED RESIDENTIAL APARTMENTS DEVELOPMENT ON PLOT LR. NO. 209/7480 LOCATED ALONG MUTHANGARI DRIVE WITHIN WESTLANDS AREA; NAIROBI CITY COUNTY

Prepared pursuant to Environmental Management and Coordination Act CAP 387 and the Environmental (Impact Assessment and Audit) Regulations (2003)

PROPONENT	LEAD EXPERTS:
THERMAX (EAST AFRICA) LIMITEDP.O BOX 2430-00606, NAIROBI	iPAN CONSULT (INT'L) LIMITED P.O BOX 28634 – 00100, NAIROBI.

DECLARATION

I certify that this project report has been prepared in total adherence to NEMA requirements as provided for in the Environmental Management and Coordination Act (Cap 387) and the Environmental (Impact Assessment and Audit) Regulations (2003). The proponent has in this regard contracted a registered EIA/ EA Firm of Experts for this very purpose.

REPORT TITLE

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PROPONENT:

THERMAX (EAST AFRICA) LIMITED
P.O BOX 2430-00606,
NAIROBI.

Signature……Date……

LEAD EXPERTS:

iPlan Consult (Int'l) LTD (NEMA REG NO: 7597)
P.O BOX 28634-00100, NAIROBI
TEL: 02022251702 / 0203546499 CELL: 0721891005
EMAIL: sk.mbuta@gmail.com, iplanconsult1@gmail.com

Signature……Date……

SHADACK K. MBUTA (NEMA REG. NO 6315)

EIA CONSULTING TEAM

1.	Name	NEMA Reg No.	Role
2.	Shadrack K. Mbuta	6315	EIA Lead expert/ Team Leader
3.	Kibuchi Samuel Waweru	-	Sociologist
4.	Jonathan Vundi Joseph	7197	EIA Lead expert
5.	Roy Lwiki Misiko:	7473	Lead EIA/EA expert
6.	Mitchel Kutwo	11180	Associate Expert
7.	Lourine Akinyi	13041	Associate Expert

Table of Contents

ACRONYMS 7
EXECUTIVE SUMMARY 8
CHAPTER ONE: INTRODUCTION 1
1.1 Preamble 1
1.2 Objectives 1
1.3 Scope 1
1.4 Terms of Reference 2
1.5 Methodology 2
CHAPTER TWO: BASELINE INFORMATION 4
2.2 Land Tenure 4
2.3 Physical Environment 5
2.3.2 Geology and Drainage 5
2.3.3 Flora and Fauna 5
b) Flora 5
2.4 Infrastructure and Services 5
2.4.1 Water Supply 5
2.4.3 Sewer 6
2.4.4 Energy 6
2.5 Development Trends 6
CHAPTER THREE: PROJECT DESCRIPTION 8
3.1 Project Description 8
3.2 Size of the Land 9
3.3 Development Permission 9
3.4 Planning Standards 9
3.5 Design Features of the Project 9
3.6 Project Construction Activities 10
3.6.1 Site Preparation 10
3.7 Decommissioning phase 12
3.8 Project Budget 12
CHAPTER FOUR: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK 12
4.1 Introduction 13
4.2 Policy Framework 13
4.2.1 National Environmental Action Plan (NEAP) 13
4.2.2 The National Poverty Eradication Plan (NPEP). 13
4.2.3 National Policy on Water Resources Management and Development 13
4.2.4 Policy Paper on Environment and Development (Sessional Paper No. 6 of 1999): 14
4.3 Legal and Legislative Framework 14
4.3.1 Environmental Management and Coordination Act No.8 of 1999 14
4.3.2 The Environmental Management and Co-ordination (Waste Management Regulations 2006); Legal Notice No. 121: Section 4-6 15
4.3.5 Physical and Land Use Planning Act, 2019 16
4.3.6 Water Act 16
4.3.7 The Electricity Power Act, 1997 16
4.4 Institutional Framework 17
4.4.1 National Environmental Management Authority (NEMA). 17
4.4.2 The Occupational Safety and Health Act, 2007. 17
4.4.3 Trade Licensing Act (Cap 497) 17

4.4.4 Environmental Vibration Pollution (Control) Regulations, 2009 17
CHAPTER FIVE: IMPACT ASSESSMENT METHODOLOGY & ANALYSIS OF ALTERNATIVES 17
5.1 Introduction 18
5.2 Methodology 18
5.3 Analysis of Alternatives 18
5.3.1 The No Action Alternative 18
5.3.2 The relocation Alternative 19
5.3.3 Alternative Land Use Activities 19
5.3.4 Alternative to Construction Materials and Technology. 19
5.3.5 Solid Waste Management Alternatives. 19
5.4 Project Design 19
CHAPTER SIX: POTENTIAL ENVIRONMENTAL IMPACTS 20
6.1 Introduction 21
6.2 Anticipated Environmental Impacts 21
6.3 Positive Environmental Impacts of Construction Activities 21
6.3.1 Creation of Employment Opportunities 21
6.3.2 Provision of Market for Supply of Building Materials 21
6.3.3 Increased Business Opportunities 21
6.3.4 Individual Investment 21
6.3.5 Optimal Use of Land 21
6.3.6 Revenue to Government 21
6.3.7 Enhanced Security. 21
6.3.8 Improved Infrastructure. 21
6.4 Negative Environmental Impacts of Construction Activities 22
6.4.1 Extraction and Use of Building Materials 22
6.4.2 Dust Emissions 22
6.4.3 Exhaust Emissions. 22
6.4.4 Traffic flow during construction 22
6.4.5 Noise and Vibration 22
6.4.6 Risks of Accidents and Injuries to Workers 22
6.4.7 Solid Waste Generation 23
6.4.8 Energy Consumption 23
6.4.9 Water Use 23
6.5 Positive Environmental Impacts of Operational Activities 23
6.5.1 Provision of Housing Facilities 23
6.5.2 Employment Opportunities 23
6.5.3 Revenue to National and Local Governments 23
6.5.4 Improved Security 23
6.6 Negative Environmental Impacts of Operational Activities 24
6.6.1 Solid Waste Generation 24
6.6.2 Energy Consumption 24
6.6.3 Water Use 24
6.7 Negative Environmental Impacts of Decommissioning Activities 24
6.7.1 Solid Waste 24
6.7.2 Noise and Vibration 24
6.8 Positive Environmental Impacts of Decommissioning Activities 24
6.8.1 Rehabilitation 24
6.8.2 Employment Opportunities 24

CHAPTER SEVEN: IMPACTS MITIGATION MEASURES 25
7.1 Introduction 25
7.2 Mitigation of Construction Phase Impacts 25
7.2.1 Efficient sourcing and Use of Raw Materials 25
7.2.2 Minimization of Run-off 25
7.2.3 Minimization of Construction Waste 25
7.2.4 Reduction of Dust Generation and Emission 25
7.2.5 Minimization of impacts on traffic flow 26
7.2.6 Minimization of Noise and Vibration 26
7.2.7 Health and safety of Workers on site 26
7.2.8 Reduction of Energy Consumption 26
7.3 Mitigation of Operation Phase Impacts 26
7.3.1 Ensuring Efficient Solid Waste Management 26
7.3.2 Minimization of Sewage Release 26
7.3.3 Ensure Efficient Energy Consumption 26
7.3.4 Ensure Efficient Water Use 27
7.4 Mitigation of Decommissioning Phase Impacts 27
7.4.1 Efficient Solid Waste Management 27
7.4.2 Reduction of Dust Concentration 27
7.4.3 Minimization of Noise and Vibration 27
CHAPTER EIGHT: ENVIRONMENTAL MANAGEMENT PLAN 28
8.1 Preamble 28
8.2 Objectives of the Environmental Management Plan 29
8.3 The Environmental Management Plan 29
8.4 CONCLUSION 45
8.5 RECOMMENDATION 45
REFERENCES 46

ACRONYMS

NEMA	National Environment Management Authority
NCC	Nairobi City County
OHS	Occupational Health and Safety
EMP	Environmental Management Plan
EMCA	Environmental Management and Co-ordination Act
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
EA	Environmental Audit
EAP	Environmental Action Plan
EIA	Environmental Impact Assessment
KPLC	Kenya Power and Lighting Company

EXECUTIVE SUMMARY

The ever Increasing population of Nairobi City County and the outskirts necessitates construction of more housing units. The current demand so far outstrips supply necessitating the Government to encourage private investments.

This report provides findings of an Environmental Impact Assessment carried out for the proposed Residential Apartments Development on LR. NO. **209/7480**. The project site is located in WESTLANDS AREA; ALONG MUTHANGARI DRIVE. The Reference Coordinates are **1°15'19.7"S 36°49'17.6"E (- 1.255472, 36.821556).**

This is presented in fulfilment of the provisions of the Environmental Management and Coordination Act, Cap 387 section 58. The main purpose of this report is to identify and project all impacts the project poses to the environment and provide elaborate mitigation measures for negative impacts. This is aimed at safeguarding the environment during execution of this project.

The proponent intends to put up a Residential Apartment with three blocks: Block A, B & C. Each block will have two Basements, Ground floor, podium plus fifteen floors.

- ✓ Basement 1: Parking slots accommodating 60 cars
- ✓ **Basement 2: Parking slots accommodating 62 cars**
- ✓ Ground floor: Parking slots accommodating 54 cars
- ✓ **Podium parking level accommodating 62 cars.**
- ✓ 1^{st}-15^{th} floors: Grand total of 225 units within the three blocks.
- ✓ **Block A will consist of 9 units per floor; four units being 1-bedrooms, three 2-bedrooms and two studio units. Total units within block A will be 135 units.**
- ✓ Block B will have three units; one 1-bedrooom unit, one 2-bedroom unit and one 3-bedrooom unit. All units within the block will total 45.
- ✓ **Block C will have three units too. One 1-bedroom unit, one 2-bedroom units andone 3-bedroom units. The block will have a total of 45 units.**
- ✓ Rooftop: Amenities including meeting room, an eatery, games room, social hall,swimming pool, yoga and gym, massage room, steam bath and others.

Preliminary Environmental evaluation established that the process of construction, operation and decommissioning of this development presents diverse impacts to the environment. Construction phase will entail various activities such as site clearing, scooping of top soil, excavation works, construction of walls, and transportation of materials to and from the site, trenching & blinding, construction of roofs, electrical and mechanical works.

Operation phase will entail activities such as commissioning of the development, admission of tenants, maintenance and repairs, routine site cleaning (solid waste collection and disposal) and traffic management among others.

Decommissioning phase on the other hand will entail doing away with the development. This can be a consequence of change in the Physical planning policy for the area, buildings and facilities on site being rendered obsolete and therefore unfit for human settlement or discovery of a better use for the site than the proposed development. There will be demolition of the buildings, dismantling of site installations and facilities, and site restoration.

In view of this, these undertakings if not properly managed, pose diverse impacts to the physical environment, infrastructure and utility services and socio-economic environment. The environment may suffer negative effects such as air pollution, soil degradation; underground water pollution, loss of vegetation cover, accidents, noise pollution; increase demand for infrastructure and utility services such as power, water and construction material that leads to dereliction of resource extraction areas.

This authenticates the need for this EIA report for purposes of identifying and outlining mitigation measures to counter all envisioned negative impacts so as to protect the veracity of the natural environment as provided for in the Environmental Management and Coordination Act (Cap 387) and the Environmental (Impact and Audit) Regulations 2003. Due to the fact that this project will involve construction activities, impacts are envisaged in all the three phases: i.e. construction, operation and decommissioning with each stage posing heterogeneous impacts to the environment. In this regard therefore, all envisioned potential impacts the project poses to the environment and proposed mitigation measures for each of the identified impact (s) are summarized in the table 1.0 below.

Table 1: Summary of preliminary impacts and proposed mitigation measures

Type of Impact (s)	Proposed Mitigation Measures
Destruction of underground waterpipes along the main access road	• Proper surveying to identify location of the water pipes • Reinforcements to protect the plastic water pipes • Marking of the positions of the water pipes especially to alert truck drivers • Have a specific entry and exit point to and from the site
Blockage of storm water drainagechannel along access road	• Use of reinforced culverts at entry and exit points to and from the site • Any excavated soils and other debris to be removed promptly and disposed off appropriately • Use of specific entry and exit points only
Destruction of soil structure	• Use of well-maintained and appropriate machinery and tools for site clearing and excavation works • Compacting of loose soil in excavated areas • Heavy machinery and trucks must be kept off-site in the Contractor's yard • Ensure that new landforms are compatible with neighbourhood development character • Ensure management of excavation activities especially during rainy conditions • Provide soil erosion control structures to help in management of surface run-offs during constructionphase. • Installation of proper drainage structures • Proper Landscaping of the site to be done after completion of construction works • Use of dug up loose soil for backfilling • Proper planning of construction activities to ensure to ensure that site demarcation affects onlydesignated sections
Surface run-off and soil erosion	• Construction works to halt and or be managed during rainy season. • Installation of drainage structures properly and proper management of excavation activities. • A storm water management plan that minimizes impervious area infiltration by use of recharge areasand use of detention and/or retention with graduated outlet control structures will be designed.

	• Surface run-off and roof water to be harvested and stored in underground water reservoirs for use ingeneral site cleaning and in the lavatories.
Piling of loose soil and otherdebris on site	• Enclose the site to prevent these waste soils and other debris from spilling over to neighbouringproperties, the road reserve and storm water drainage channels. • All dug up soil not needed on-site to be removed promptly and disposed of to appropriate areasapproved by the Nairobi City County Government and NEMA. • Re-use the soil in backfilling and landscaping. • Construction materials to be supplied on demand and right quantities for use in time.
Loss of vegetation	• Designing and implementation of a landscaping programme to help re-vegetate the site afterconstruction activities are completed • Ensure proper demarcation of the project site for various activities so as to prevent unnecessarydestruction of the environment • Introduction of vegetation (trees, shrubs, grasses) in open spaces and around the project site withproper maintenance
Fire risk	• Adoption of an elaborate fire risk policy by the proponent Workers and tenants to be trained on firepreparedness and response • Liaising with the County fire department and emergency response institutions such the Kenya red cross • Construction materials and finishes must be fireproof • One 9kg Co2 fire extinguisher shall be stationed at strategic points. • Water hydrants should be installed within the premises. • All the electrical connections shall have one central emergency stop switch; in addition, they shall bedesigned by a registered engineer
Increased vehicular traffic generation and nuisance	• Formulation of a proper **traffic management plan** for use by the contractor during construction phase • Supply of construction materials to be done during off peak time and on demand basis only

	• Use of acceleration and deceleration lanes for entry and exit • Vehicles shall not idle on site but rather in the contractors yard • Truck drivers to be instructed not to be reckless and observe convectional traffic rules
Waste water (sewage)generation	• The site to be connected to the Nairobi Sewer line for management of all waste waters generated by thevarious activities on site • All drain pipes passing under the building, driveway or parking should be of heavy duty PVC pipe tubeencase in 150mm concrete surround. • All manholes on drive ways and parking areas should have heavy duty covers set and sealed airtight asapproved by specialists. • All waste pipes should have cleaning rodding accessible from outside and free to every part of thesystem for inspection, cleaning and repair. • Sanitary facilities should be kept clean always through regular cleaning. • All liquid wastes to be effectively channelled to the NCWSC line serving the area • Regularly monitor effluent quality to ensure that the stipulated discharge rules and standards are notdesecrated • Special attention shall be paid to the sanitary facilities on site to be used by construction workers toensure no spillages and or leakages
	• Conduct regular checks for any blockages
Solid Waste generation	• Ensure that all the solid waste management systems during construction and operational phases of theproject do comply to the EMCA (Waste management) regulations (2006)
	• Use of an integrated solid waste management system i.e. through a hierarchy of options: reduction,sorting, re-use, recycling (where applicable) and proper disposal
	• Incorporate suitable facilities for collection, segregation and safe disposal of solid wastes.
	• Provide waste bins for solid waste disposal in every household
	• Ensure a continuous review of waste management procedures with changing technology and regulatory changes.
	• Use of construction materials that need minimal packaging to reduce packaging wastes on site
	• Through accurate estimation of the sizes and quantities of materials required, order materials in the sizes and quantities they will be needed, rather than cutting them to size,

	or having large quantities of residual materials.
	• Contracting a licensed waste collection and disposal company during the operation phase
	• Regular removal and transportation of excavated soil and other solid wastes to the County dumpsite
	• Creation of awareness on proper solid waste disposal methods among the construction staff.
Noise pollution and vibrations	• Comply with the maximum permissible noise levels for construction sites as provided for in the second schedule of the Environmental and coordination (Noise and excessive vibration pollution) control regulations (2009).
	• Location of all stationary noise sources from high sensitive primary receptors as far as possible
	• Ensure that construction machinery are well maintained thus kept in good condition to reduce noisegeneration
	• Sensitize construction drivers to avoid unnecessary hooting especially when passing through sensitiveareas such as learning institutions, residential areas and health facilities.
	• Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles ormachinery not being used.
	• Ensure that all generators and heavy-duty equipment are insulated or placed in enclosures to minimizeambient noise levels.
	• Portable barriers and trees around and within the site will provide some buffer against noise propagation
	• The noisy construction works will entirely be planned to be during day time (0800hrs-1700hrs) whenmost of the neighbours will be away at work.
	• Workers in the vicinity to wear safety and protective gear
Air pollution	• The site should be enclosed with dust-proof net for dust screening where necessary during construction
	• If possible, use of electrically operated machines to reduce exhausts fumes thus avoid externalitiesproduced by diesel engines.
	• Sprinkle water on site and all material that emit dust when being used

	• Workers on site to use nose-muffs during construction works
	• Sprinkle water along the road near the site during construction phase
	• Cover all trucks hauling soil, sand, cement and other loose materials to and from the site. Besides allthese trucks must maintain at least two feet of free board.
	• Pave and or apply water if necessary, or non-toxic soil stabilizers on all unpaved access roads, parkingand staging areas on site**.**
Occupational Health and Safety	• Label all risk facilities on site to enhance public and general awareness • Unattended public access to the construction site to be highly restricted
	• Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction using prescribed forms obtainable from the local Occupational Health and Safety Office (OHSO) are in place.
	• All workers and visitors should be provided with appropriate safety/ protective equipment and gearwhile on site. • Carrying out annual environmental and safety audits for the Development. • Safety kits and emergency facilities should be provided in-case of any accidents and incidents commonto projects of such a nature. These should be placed in strategic locations on site. • Standards and legal requirements should be adhered to. These include: Building code, OccupationalSafety & Health Act, the Public Health Act, as well as other recognized best practices and procedures. • The project proponent and contractor should take appropriate insurance cover for the various project activities and personnel
	• Regular inspection and servicing of the equipment must be undertaken by a reputable service providerand records of such inspections maintained
	• Ensure general safety and security at all times by providing day and night security guards and adequatelighting within and around the construction site.
	• Establish liaison with the County's fire department and other emergency service providers such asHospitals and the police.

	• Fire fighting equipment such as fire extinguishers and hydrant systems should be provided at strategiclocations such as stores and construction areas.
Increased demand for infrastructure utilities and services (Power, water, etc.)	• Implement a programme of energy saving in the building design besides carrying out of energy useaudits, including repairs to check energy loss
	• Ensure electrical equipment, appliances and lights are switched off when not being used.
	• Use of alternative energy sources such as Solar panels
	• Installation of 'delayed release water taps' to help reduce unnecessary water wastage
	• Discourage activities that need excessive water usage on site
	• Installation of energy saving fluorescent tubes and bulbs at all lighting points.
	• Creation of awareness on energy and water conservation and economical use
	• Quick fixing of all broken and or leaking taps, pipes, toilet cisterns and tanks
	• Provision of adequate water storage facilities for use during shortage
	• Use of alternatives such as tank water on-site to ensure that there will be no water supply shortage tothe tenants. • Recycle materials that are useful on site (where applicable)
	• Ensure proper quantity of supply of material to minimize wastage.
	• Re-sale of re-usable waste materials as a cost cutting measure as the money accrued can be used forother activities and or services
	• Ensure accurate budgeting and estimation of actual construction material requirements to ensure that only the required amount of material necessary is ordered, minimizing damage or loss of materials
	• Engage a competent site and materials manager to monitor and advise on use
Socio-Economic	• Awareness creation on such issues as diseases especially STDs • The project must be completed within the stipulated time frame to reduce nuisance to the neighbourhood

Impacts	• The local community shall provide casual labour force on the construction site where possible
	• A concrete perimeter wall around the site to minimize intrusion and promote good neighbourliness,including respect for neighbours' privacy
	• Develop a grievance mechanism, which should outline how agents/managers of the residence will address any complaints or grievances raised by the neighbours or by their tenants
	• Security to be provided on site at all times by a private security company.
Decommissioning of the project	• Issuance of a three months' notice to all residents within the premises to relocate or look for alternativeplaces. • This report recommends that an elaborate EIA must be carried out for the decommissioning activitiesso as to effectively address the negative impacts that may result from the same.
	• Assisting those who will still be either employed or still resident on site to search for alternative employment/residents elsewhere
	• Contracting of qualified persons to carry out the demolition works
	• Proper collection, sorting and disposal of all types of resultant wastes
	• Ensuring that materials that can be re-used are well stored and or transported elsewhere.
	• Ensuring that any hazardous wastes are carefully removed, sorted and properly disposed of if any • Elaborate soil tests must be carried out to identify any hazardous and or radioactive materials on site

Conclusion

This EIA project report has established that the proposed development project is a **low risk** project. This is due to the fact that envisaged impacts can be effectively mitigated with obstinate compliance with the proposed mitigation measures as stated in Chapter Seven of this report by all parties involved in its execution and conditions of approval by NEMA. This is besides strict adherence to any other law intended to protect the sanctity of the environment for all such developments in Kenya. Furthermore, there is provided an elaborate and detailed **Environmental Management Plan** to guide all parties involved in executing the project so as to obviate any potential negative environmental impacts posed by the different project activities in all phases, right from commissioning to decommissioning. In this regard therefore, this project is hereby recommended for approval and licensing by the National Environment Management Authority to enable the proponent commence construction works on site.

CHAPTER ONE: INTRODUCTION

1.1 Preamble

This EIA report has been prepared in fulfilment of the requirements of NEMA as provided for in the Environmental Management and Coordination Act (Cap 387) and Environmental (Impact Assessment and Audit) Regulations (2003) and the Physical & Land Use Planning Act, for the proposed Residential Apartment Development on plot LR. No**. 209/7480** located along Muthangari Drive; Nairobi City County. Under Section 58 of EMCA Cap 387, this scale of development needs to undergo Environmental Impact Assessment to evaluate potential negative impacts the development may have on the natural environment and provide mitigation measures to avert the negative impacts the environment may suffer in the process of its execution.

A registered NEMA Expert was therefore contracted to carry out the study in order to identify, predict, describe and propose mitigation measures for all envisaged negative impacts. The approach adopted will be two dimensional in that it will endeavour to strengthen the positive impacts of the project while reducing and mitigating any negative impact posed by this project.

1.2 Objectives

The main objective of this EIA project report is to identify, predict and describe all potential negative environmental impacts occasioned by implementation of the project. The report also provides elaborate mitigation measures to address all identified impacts to ensure that the environment is protected at all stages and phases of the implementation process. The information provided will enable all institutions responsible for environmental protection to make the right decision during review and approval of this project.

1.3 Scope

The scope of the study covers the entire project site and the immediate neighbourhood within which it is situated; and the project cycle from commissioning, operation and decommissioning stages. This is based on ardent analysis of baseline conditions of the proposed project site, impacts to the neighbourhood, evaluation of the construction activities and processes and projection of all envisaged impacts. This will therefore provide Environmental Management Plan for the proponent, Contractor and any other interested party who will be involved on how best to execute the project without compromising environmentalquality at all phases.

1.4 Terms of Reference

For purposes of achieving the all objectives, the following areas shall be our points of consideration:

- ***i.*** Identify and assess all the potential negative impacts of the project on the surrounding area and the natural environment, particularly as it relates to the cumulative impacts of this project on any of the existing environmental components.
- ***ii.*** Describe the development in terms of its size, location, proponent, land ownership and thedifferent components of it.
- ***iii.*** Evaluate waste management on site for both solid and liquid wastes through all thephases of execution of this development project.
- ***iv.*** Conduct a socio-economic and cultural evaluation of the proposed development area andits surroundings.
- ***v.*** Address all potential impacts of increased surface run-off and sediment loading will alsobe addressed.
- ***vi.*** Describe the mitigation measures to be employed during the proposed works.
- ***vii.*** Outline proper disposal of solid and hazardous waste during the construction and operational phases.
- ***viii.*** Provide the timelines for individual tasks to be undertaken and respective actors.
- ***ix.*** Present a detailed Environmental Monitoring and Management Plan for the project.

1.5 Methodology

The methodology adopted was one that ensured public participation through general awareness, administration of questionnaires and conducting of Focus Group Discussions. The main purpose was to ensure that all concerns of the neighbours are taken care of and addressed accordingly. In working to realize the EIA report objectives therefore as required by NEMA, several methods as stipulated in EMCA and accompanying regulations were employed. These included the following;

- ✓ Awareness creation where the neighbours were informed of the impending project and notified of the different activities it entails though Focus Group Discussions.
- ✓ The second phase involved Environment screening in which the project was identified as among those requiring EIA under the provisions of the 2nd schedule of EMCA, Cap 387,
- ✓ In addition to this, Environmental scoping was done that highlighted the key environmental issues of concern under this study and that need mitigation,
- ✓ Literature review: Desktop studies were very crucial in providing preliminary information on the project itself and its location and the wider geographical area it is situated.
- ✓ Conducting of a number of scheduled interviews by way of questionnaires to the

immediate residents and other stakeholders-architect, Engineers, Quantity Surveyor and project contractor.

- ✓ Physical inspection of the site and surrounding areas to enable collection of other primary information for site specific analysis.
- ✓ In addition, general transect surveys were conducted to profile the immediate project area for development trends.
- ✓ This was followed by data collection, analysis and compiling of the information and writing of this project report.
- ✓ Presentation of this report NEMA and circulation to other agencies for consideration and consequent approval through issuance of a NEMA License.

CHAPTER TWO: BASELINE INFORMATION

2.1 Project Location

The project site is located along Muthangari Drive, within **Westlands Area**, Nairobi City County. It sits on plot LR. No**. 209/7480** (See survey/location plan attached).

Figure 1: Proposed project site

Source: Field Survey, 2022

2.2 Land Tenure

The consultant established that the proposed project site is owned by **Thermax (East Africa) Limited** on Leasehold basis and the proponent has a certificate of lease as proof of ownership (See copy of Title attached in the Appendix hereto).

2.3 Physical Environment

2.3.1 Climate

The general climate of Nairobi County is semi-arid with an altitude of about 1,795 meters above sea level. There are two rainy seasons but rainfall can be moderate. The cloudiest part of the year is just after the first rainy season, when, until September, conditions are usually overcast with drizzle. The difference between the seasons (wet season and dry season) is minimal as Nairobi is close to the Equator.

2.3.2 Geology and Drainage

The project area is generally flat. This offers ample grounds for construction works. Development of the proposed project in the site will not require levelling works as the slope difference is minimal and unrestrictive to construction works. The area is well drained given storm water drains naturally.

2.3.3 Flora and Fauna

a) Fauna

Due to the fact that the plot is located in an occupied neighbourhood, human settlements have made it that there are currently no animals on site. Therefore there is no endangered species of fauna threatened by execution of the proposed project.

b) Flora

The wider project area has undergone transformation with the construction of residential developments that have greatly reduced vegetation cover.

The project site has little vegetation. Most of these will be cleared to pave way for the construction works. The site will however, be planted with vegetation in all un-built up sections and the wider project site after construction activities are completed.

2.4 Infrastructure and Services

2.4.1 Water Supply

The project site is already connected to water supply from Nairobi City Water & Sewerage Company.

The supply is adequate to meet both current and future water demand when the project is operational. However, there will be increased demand for water during the construction phase. This will be met by tank water supply that the proponent will have to contract for this very purpose.

2.4.2 Roads

The project site is served by the Muthangari Drive which is in good condition. This has ensured highest level of accessibility to the project site.

Figure 2: Access Road

Source: Field Survey, 2022

2.4.3 Sewer

The site is connected to the NCWSC Sewer line serving the area for collection and management of all waste waters generated on site.

2.4.4 Energy

The project site is already connected to the main KPLC power supply. Information sought from KPLC offices confirmed that the capacity of the transcending line is able to meet the anticipated energy demand.

2.5 Development Trends

The site is located in Westlands Area along Muthangari Drive. The area is characterized by a number of residential and commercial/offices like The Address, Nova etc. This development is not in conflict with the existing neighbourhood developments.

Figure 3: Development trends

Source: Field Survey, 2022

CHAPTER THREE: PROJECT DESCRIPTION

3.1 Project Description

The proponent intends to put up a Residential Apartment with three blocks: Block A, B & C.Each block will have two Basements, Ground floor, podium plus fifteen floors.

- ✓ *Basement 1: Parking slots accommodating 60 cars*
- ✓ **Basement 2: Parking slots accommodating 62 cars**
- ✓ *Ground floor: Parking slots accommodating 54 cars*
- ✓ **Podium parking level accommodating 62 cars.**
- ✓ *1st-15th floors: Grand total of 225 units within the three blocks.*
- ✓ **Block A will consist of 9 units per floor; four units being 1-bedrooms, three 2-bedrooms and two studio units. Total units within block A will be 135 units.**
- ✓ *Block B will have three units; one 1-bedrooom unit, one 2-bedroom unit andone 3-bedrooom unit. All units within the block will total 45.*
- ✓ **Block C will have three units too. One 1-bedroom unit, one 2-bedroom units and one 3-bedroom units. The block will have a total of 45 units.**
- ✓ **Rooftop: Amenities including meeting room, an eatery, games room, social hall,swimming pool, yoga and gym, massage room, steam bath and others.**

Project Phases

The project will be implemented in four main phases comprising of pre-construction, construction, operation and decommissioning of the project. This will be carried out after necessary approvals for the development will have been secured from all relevant authorities as provided by law. The details of each of the phases are discussed below:

3.1.1 Phase One: Pre-Construction

This report established that there will be no significant impacts experienced during the pre- construction phase of this project. This is due to the fact that the developer is the site owner; the site is undeveloped and not settled.

3.1.2 Phase Two: Construction

The following details some of the activities (list not exhaustive) expected to be undertaken during this phase such that if mitigation measures are not put in place, the environment is at risk:

3.1.3 Site demarcation and clearing,
3.1.4 Scooping of the top soil
3.1.5 Construction of boundary wall
3.1.6 Excavation works, trenching & Blinding
3.1.7 Installation of services such as water, power lines
3.1.8 Electrical wiring and equipment installation
3.1.9 Backfilling and landscaping of the site
3.1.10 Installation of fire suppression equipment and emergency kits

3.1.11 Transportation of materials and wastes to and from the site respectively

3.1.12 Phase Two: Operation

This details all activities to be carried out after construction works are completed. Theyinclude the following:

- Testing of the systems and site installations and correction of any faults detected
- Commissioning of the premises
- Admission of tenants
- Continuous monitoring and testing of the entire system including Septic tanks.
- Maintenance and repairs & Routine site cleaning (solid waste collection and disposal)
- Record keeping of daily operations

3.1.13 Phase Three: Decommissioning:

This is the very last phase of the project cycle that will include bringing to an end of all operations of the project. Main activities will include issuance of notice for the intended works, demolition of existing structures, dismantling of equipment and installations and electrical appliances, disposal of wastes, soil testing for any contamination and radioactivity and site restoration.

3.2 Size of the Land

The developer otherwise referred to in this report as the **proponent** wishes to establish the aforementioned development on the affected plot measuring **(0.300 Ha**).

3.3 Development Permission

The development has been approved by the Nairobi City County Physical Planning office uponChange of Use application to legally accommodate the Residential Apartments Development.

3.4 Planning Standards

The proposed development will adhere to the zoning and planning standards of the CountyGovernment of Nairobi and the conditions of approval as provided for in the Form PPA 2.

3.5 Design Features of the Project

The architectural design of the proposed development takes into account standards provided for in the PLUPA No. 13 of 2019, Physical Planning Handbook and the Kenya Building Code 2000. These include but are not limited to the following:

- ❖ Maximum use of natural ventilation to reduce energy consumption
- ❖ Paved and landscaped forecourt to help in prevention of soil erosion

- ❖ Parking that is adequate to serve all anticipated users of this facility
- ❖ Solid and liquid management systems

3.6 Project Construction Activities

3.6.1 Site Preparation

Site preparation shall involve demarcation of the project site within the plot to establish and mark out the area that will be affected by the proposed project. This will be followed by clearing of some of the vegetation on site to pave way for the new construction works to commence.

Excavation and Foundation Works

Excavation will be carried out to remove loose top soil for construction of foundation**,** pavement**s** and drainage systems. This process will be supervised by the City Engineer, City Environment officer, project architect and contractor to ensure compliance with the set standards, quality and the implementation of the recommended mitigation measures.

Materials' standards

This report submits that for purposes of ensuring high quality and standard buildings, materials for the construction should not be less that as provided herein. Concrete to be class 25/20 with minimum cubic strength of $25N/MM^2$ at 28 Days. Cover to Main Reinforcement: All concrete to be compacted by poker vibrator to structural engineer details. Foundation 50 mm thick, Beam 30 mm thick. The design to be in accordance with B S 8110 provisions.

Masonry and Concrete Works

The construction of the foundation, floors, pavements and drainage system, underground tanks among other components of the project involves a lot of masonry work and related activities. General masonry and related activities include stone shaping, concrete mixing, plastering, and slab construction, construction of foundations and erection of building walls and curing of fresh concrete surfaces. These activities are known for the labour intensive and are supplemented by machinery such as concrete mixtures.

Project input and Materials

The following are the main material input in the proposed project but are not limited thereto**:-Land: 0.300 Ha** of land has been acquired for this purpose

Water: Water supply from NCWSC

Labour: Different forms of labour both skilled and unskilled will be utilized

Material inputs: Sand, Masonry stone, Cement, Ballast, Gravel , Water, Soil, Electrical wires, gadgets and equipment, Steel (reinforcement, casement, wiring and standard fittings), Glass, PVS Material : (tiles, PVC pipes, conduits, and fittings), Concrete and paving, Paints and vanishes, Plant materials –grass, trees, seedlings and Timber etc.

Storage of Materials

Building materials will be stored on site. Bulky materials such as stones, ballast, sand, and steel will be carefully piled on site. To avoid piling large quantities of materials on site, the proponent will order bulky materials such as sand, gravel and stones in quotas. Materials such as cement, paint and glasses among others will be stored in the site office built for thispurpose.

Electrical Works

Electrical work during construction of the premises will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, bulb, sockets etc. In addition there will be other activities involving the use of electricity such as welding and metalcutting to attain the desired results. The proponent will employ services of a qualified electrical engineer for the same.

Plumbing

Installation of pipe-work for water supply and distribution will be carried out within the project and associated facilities. In addition pipe work will be done to connect sewage from generation points to the sewer line, and for drainage of storm water from the rooftop into the peripheral storm water drainage system. Plumbing activities will include metal and plastic cutting, the use of adhesive, metal grinding and wall drilling among others. This will be done by a registered mechanical engineer.

Project Products and By-Products

The main product from the proposed project is the residential Apartments development with complementary facilities.

By-products from the project may include:

Increased traffic generation to and from the site, increased waste water discharge, increased surface water runoff, increased solid waste generation and accumulation, increased pressure on site facilities and infrastructure. At this juncture, it is important to note that all the possible negative impacts of all the above will be fully addressed by an elaborate Environmental Management Plan in Chapter Seven below.

Project's Operational Activities

This provides a brief description of activities following successful completion of the construction and finishing works for this development after which the following will be take place.

Occupation Certificate

The proponent will have to notify the County Physical Planning and Public health offices of the completion of the work. Upon inspection of the premises by these officers, an occupation licence will be issued as soon as it is approved as being fit and safe for human occupation.

Solid Waste

The proponent will utilize all available effective strategies that are convenient for sound

wastemanagement. This will include among others, provision of facilities for handling solid waste generated within the premises and around the site. All the solid wastes generated shall be kept in litter bins and later transferred to refuse bins for disposal. The services of a private waste management company shall be engaged to undertake routine collection to the approvedcounty dumpsite.

Waste water Management

Liquid wastes shall be managed through use of the NCWSC. **Routine repairs and Maintenance works**

Due to the effects of weather conditions and possible breakages and destruction of surfaces, there will be routine repairs and maintenance works such as repainting, mechanical works, electrical fittings etc. This will be done upon a public notice before commencement of the works. This will be aimed at ensuring that the spaces remain habitable, attractive and does notdestroy the development character of the neighbourhood.

3.7 Decommissioning phase

Upon expiry of the usefulness of the building, decommissioning of the proposed project will beeffected followed by rehabilitation of the site to restore it to its original status or to a better state than it was originally will be preceded by demolition of the buildings. This will include replacement of topsoil and re-vegetation which will lead to improved visual quality of the area. This may be a consequence of the planning policy of the area by the City County Government, the identification, by the proponent of a better user for the site and or the building being rendered obsolete thus not fit for human occupation and use.

3.8 Project Budget

Information gathered from the detailed Bill of Quantities prepared for this particular project on plot L.R. NO. **209/7480** indicates that the approximate project cost is **Kshs. 503,844,000/=** only (Five hundred and three million, eight hundred and forty four thousand Kenya Shillings Only.

CHAPTER FOUR: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 Introduction

The EIA is an instrument for environmental management and control of development. Development initiatives have now been considered to be economically feasible, socially acceptable and ecologically friendly. Developers must do Environmental Impact Assessment (EIA) on development projects as a prerequisite of the Kenya administration. The construction of buildings both commercial and residential requires an Environmental Impact Assessment project report prepared and submitted for review by the National Environment Management Authority, (NEMA), in accordance with Articles 58 and 138 of Environmental Management and Coordination Act (EMCA) No 8 of 1999 and Section 3 of Environmental (Impact Assessment and Audit) Regulations, 2003 (Legal Notice No.101).

4.2 Policy Framework.

Environmental policies cut across all sectors and government departments. As such, policy formulation should be consultative steered by interdisciplinary committees. Recent policies, which the government is working on, include the Draft Wildlife Policy, Draft National Land Policy, and Wetlands Management and Conservation Policy.

4.2.1 National Environmental Action Plan (NEAP).

An intentional policy endeavor to include the environment in the national development goals and strategies was the National Environmental Actions Plan. The approach was advisory and multi-sectoral. Such an approach has guaranteed that environmental management and conservation are essential to different policy platforms.

4.2.2 The National Poverty Eradication Plan (NPEP).

The objective NPEP is to alleviate poverty in rural and urban areas by 50 percent by the year 2015; as well as the capabilities of the poor and vulnerable groups to earn income. It also aims to narrow gender and geographical disparities and a healthy, better-educated and more productive population.

4.2.3 National Policy on Water Resources Management and Development

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

by the emissions.

4.2.4 Policy Paper on Environment and Development (Sessional Paper No. 6 of 1999):

The key objectives of the Policy include: -

To ensure that from the onset, all development policies, programs and projects take environmental considerations into account,

- To ensure that an independent environmental impact assessment (EIA) report is prepared for any industrial venture or other development before implementation,
- To come up with effluent treatment standards that will conform to acceptable health guidelines. Under this paper, broad categories of development issues have been covered that require a "sustainable development" approach.

4.3 Legal and Legislative Framework

4.3.1 Environmental Management and Coordination Act No.8 of 1999

This project report has been undertaken in accordance with the Environment (Impact Assessment and Audit) Regulations, 2003, which operationalizes the Environmental Management and Coordination Act, 1999. The report is prepared in conformity with the requirements stipulated in the Environmental Management and Coordination Act No. 8 of 1999 (EMCA) and the Environmental Impact Assessment and audit Regulations 2003, Regulation 7 (1) and the Second Schedule.

Part II of the said act states that every person is entitled to a clean and healthy environment and has the duty to safeguard the same. In order to achieve the goal of a clean environment for all, new projects listed under the second schedule of Section 58 of EMCA No. 8 of 1999 shall undergo an Environmental Impact Assessment. This includes development activities such as this new housing development. In addition to the legal compliance above, the following legal aspects have also been taken into consideration or will be taken into consideration before commencement of construction:

Section 72 of the Act prohibits discharging or applying poisonous, toxic, noxious or obstructing matter, radioactive or any other pollutants into aquatic environment. According to section 73 of the act, operators of projects which discharge effluent or other pollutants into the aquatic environment are required to submit to NEMA accurate information on the quantity and quality of the effluent. Section 76 provides that all effluent generated from point sources are to be discharged only into the existing sewerage system upon issuance of prescribed permit from the local authorities.

Section 87 (1) makes it an offence for any person to discharge or dispose of any wastes, whether generated within or outside Kenya, in such a manner as to cause pollution to the environment or ill health to any person. The proponent will have to ensure that environmental protection facilities or measures to prevent pollution and ecological deterioration such as sewerage connections, solid waste management plans, and

landscaping and aesthetic improvement program me are implemented and maintained throughout the project cycle. As well the; proponent will have to ensure that appropriate measures to prevent pollution of underground and surface water are implemented throughout the project cycle.

4.3.2 The Environmental Management and Co-ordination (Waste Management Regulations 2006); Legal Notice No. 121: Section 4-6

Part II of the Environmental Management and Co-ordination (Waste Management) Regulations, 2006 states that: - 4. (1) No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.

Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed off such waste in the manner provided for under these Regulations.

Without prejudice to the foregoing, any person whose activities generates waste has an obligation to ensure that such waste is transferred to a person who is licensed to transport and dispose off such waste in a designated waste disposal facility. In addition, the Regulations state that:

(1) a waste generator shall minimize the waste generated by adopting the following cleaner production methods

Improvement of production process

Monitoring the production cycle from beginning to the end

Incorporating environmental concerns in the design and disposal of a product. A waste generator shall segregate waste by separating hazardous wastes from non-hazardous waste and shall dispose of such wastes in such facility as shall be provided by the relevant local authority.

(23) No person shall engage in any activity likely to generate any hazardous waste without a valid Environmental Impact Assessment license issued by Authority under the provisions of the Act.

The proponent shall ensure that the main contractor adopts and implements all possible cleaner production methods during the construction phase of the project. During the construction phase of the project, the proponent shall ensure that the main contractor implements the above-mentioned measures as necessary to enhance sound Environmental Management and Coordination (Noise management of waste).

4.3.3 Waste Water Management;

Legal Notice No. 120; Part II – Protection of Sources of Water for Domestic Use.

(1) every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of these Regulations. (2) No person shall throw or cause to flow into or near a water resource any liquid, solid or gaseous

substance or deposit any such substance in or near it, as to cause pollution. All sources of water for domestic uses shall comply with the standards set out in the First Schedule of these Regulations.

The proponent and project Architect as well as engineer are urged to ensure that sewer is well designed during the construction phase of the project, and upon completion the entire project is supposed to be connected to the same for proper management of liquid waste.

4.3.4 Public Health Act Cap 242

Part IX section 115 of the Act states that no person or institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that local Authorities take all lawful necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to injuries or dangerous to human health. The plans for the above project have been submitted for approval in Nairobi County.

4.3.5 Physical and Land Use Planning Act, 2019

This is an Act of Parliament that provides for the preparation and implementation of physical development plans and for connected purposes. It further provides for development control and construction guidelines for buildings as well as land use planning and management in all parts of the country regardless of land tenure.

4.3.6 Water Act

Section 82, subsection 1 provides that applications for permits for the same purpose or for different purposes shall receive consideration in accordance with the circumstances of each use. The Ministry of water is vested with the duty to conserve and regulate the use of natural water resources (estuaries, surface, ground water and marine). The Act prohibits the release of wastewater without a permit and also spells out penalties for pollution of water.

Compliance:

The contractors have been asked to ensure that no materials are deposited into water bodies during construction and after construction. This could achieve by ensuring that all the building materials are fully utilized and all foreign materials must be cleared from site upon completion of the work.

4.3.7 The Electricity Power Act, 1997

Section 55 (1) in the execution of works in connection with the construction, modification, maintenance or operation of an electric supply line or apparatus or conductor connected thereto, every licensee shall: - In no way injure the works, conveniences or property belonging to any such other such authority, company or person, nor obstruct or interfere with public traffic, except with the previous consent of the board. Take adequate

precautions to protect from danger any person engaged upon such works by the provision and maintenance in safe and efficient conditions of the necessary safety appliances for the use of such persons and by ensuring their proper use, or by other means approved by the board.

4.4 Institutional Framework

At present, there are over twenty (20) institutions and departments which deal with environmental issues in Kenya. Some of the key institutions include the National Environmental Council (NEC), National Environmental Management Authority (NEMA), the Forestry Department, Kenya Wildlife Services (KWS) and others. There are also local and international NGOs involved in environmental activities that impact on the environment in one way or the other in the country.

4.4.1 National Environmental Management Authority (NEMA).

The object and purpose for which NEMA is established is to exercise general supervision and co- ordination 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. A Director General appointed by the president heads NEMA.

4.4.2 The Occupational Safety and Health Act, 2007.

This is an act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. The Act was published in the Kenya Gazette Supplement No. 111 (Acts No.15). It received presidential assent on 22nd October, 2007 and became operational on 26th October, 2007.

4.4.3 Trade Licensing Act (Cap 497)

Section 5 of the Act makes it mandatory for all businesses to obtain trading licenses.

4.4.4 Environmental Vibration Pollution (Control) Regulations, 2009

These regulations were published as legal Notice No. 61 being a subsidiary legislation to the Environmental Management and Co-ordination Act, 1999.

CHAPTER FIVE: IMPACT ASSESSMENT METHODOLOGY & ANALYSIS OF

ALTERNATIVES

5.1 Introduction

This chapter will describe the impact assessment methodology to be used for this project. The methodology has been developed by the consultant and aims to provide a relatively objective approach for the assessment of potential impacts.

5.2 Methodology

To ensure a direct comparison between various impacts, standard rating scales have been defined for assessing and quantifying the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. Five factors need to be considered when assessing the significance of impacts, namely:

Relationship of the impact to temporal scales – the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.

Relationship of the impact to spatial scales – the spatial scale defines the physical extent of the impact.

The severity of the impact – the severity/beneficial scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party. The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it.

The likelihood of the impact occurs – the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development.

5.3 Analysis of Alternatives

5.3.1 The No Action Alternative

The No Action Alternative in respect to the proposed project implies that the status quo is maintained i.e., no construction/development activity to take place. This option is most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. However, the need for such development is high and the anticipated insignificance environmental impacts resulting from construction have already been experienced. The No Project Option is the least preferred from the socio-economic and partly environmental perspective since if the project is not done: -

The economic benefits especially during constriction i.e. provision of jobs for skilled and non-skilled workers will not be realized.

There will be no generation of income by the developer and the Government.

The social-economic status of Kenyans and local people would remain unchanged.

The local skills would remain under utilized

No employment opportunities will be created for Kenyans who will work in the project

area.

Discouragement for investors to produce this level of standard and affordable developments.

5.3.2 The relocation Alternative

Relocation option to a different site is an option available for the project implementation. At the moment, there are no alternative sites for the proposed development (i.e. the project proponent doesn't have an alternative site). This means that the proponent has to look for the land if relocation is proposed.

The project proponent would spend another long period of time on design and approvals of the plans by the relevant government departments. The project design and planning before the stage of implementation would call for costs; already incurred in the proposed development i.e. whatever has been done and paid to date would be counted as a loss to the proponent. In consideration of the above concerns and assessment of the current proposed site, relocation is not a viable option. From the analysis above, it becomes apparent that the No Project Alternative is not the appropriate alternative to the local people, Kenyans, and the Government of Kenya.

5.3.3 Alternative Land Use Activities

The area is in a residential zone i.e. used for residence. Alternative land use activities such as farming and car repairs will conflict with surrounding land use activities. For uniformity purposes, the proponent is interested in construction of a development similar in both form and character to what is existing in the neighbourhood.

5.3.4 Alternative to Construction Materials and Technology.

There is a wide range of construction and furnishing materials which can be sourced locally and internationally. In this construction, certified raw materials/equipment and modern technology will be used. Also, electrical appliances that save energy will be given first priority. The concrete pillars and walls will be made using locally sourced stones, cement, sand (washed and clean), metal bars and fittings that meet the Kenya Bureau of Standards requirements.

5.3.5 Solid Waste Management Alternatives.

Throughout construction, the project will produce wastes such as soil, wood chips, metal scraps and paper wrappings among other. Wastes to be generated during operation phase are mainly domestic in nature. The Proponent is expected to observe EMCA (Waste Management Regulations, 2006). Priority will be given to reduction of wastes, recycling, and reuse. This will minimize environmental pollution.

5.4 Project Design

This Environmental Impact Assessment Project Report is based on information and

consultations with the project proponent, the Architect and details contained in the architectural plans and drawings of the project. (Please see attached copies of Architectural Plans). The project will entail construction of a storied residential development.

CHAPTER SIX: POTENTIAL ENVIRONMENTAL IMPACTS

6.1 Introduction

This chapter outlines the potential negative and positive impacts that will be associated with the housing project. The impacts will be related to activities to be carried out during construction of the project. The operational phase impacts of the project will be associated with the activities carried out by the residents/tenants, which will mainly be domestic. In addition, closure and decommissioning phase impacts of the project are also highlighted.

6.2 Anticipated Environmental Impacts

During the field survey, key impacts both positive and negative relating to the proposed residential development was identified. They were obtained by making physical observations at the project site as well as existing land use in the neighborhood.

6.3 Positive Environmental Impacts of Construction Activities

6.3.1 Creation of Employment Opportunities

Several employment opportunities will be created for construction workers during the construction phase of the project. This will be a significant impact since unemployment is currently quite high in the country at large.

6.3.2 Provision of Market for Supply of Building Materials

The project will require supply of large quantities of building materials most, of which will be sourced locally. This provides ready market for building material suppliers such as quarrying companies, hardware shops and individuals with such materials.

6.3.3 Increased Business Opportunities

The large number of project staff required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as food vendors around the construction site.

6.3.4 Individual Investment

Economically, the project will be an investment to the proponent. The proposed project once complete can also be used as a collateral asset.

6.3.5 Optimal Use of Land

The residential development leads to optimal use of land. Considering the scarcity of serviced land in Nairobi, the project enhances the returns on the limited land space in the city.

6.3.6 Revenue to Government.

Value Added Tax (VAT) on construction materials/ tools to be purchased and NEMA fees among others will be sources of revenue for the government and its institutions.

6.3.7 Enhanced Security.

During the operation of the project, security will be enhanced in the premise and the houses through distribution of suitable security lights and presence of a security guard. This will lead to improvement in the general security in the surrounding area.

6.3.8 Improved Infrastructure.

Project activities will lead to improvement of transport, sewerage, water supply and

telecommunication networks. Such services are a prerequisite to development in any region.

6.4 Negative Environmental Impacts of Construction Activities

6.4.1 Extraction and Use of Building Materials

Building materials such as hard core, ballast, cement, rough stone and sand required for construction of the housing project will be obtained from quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers and land. Since substantial quantities of these materials will be required for construction of the buildings, the availability and sustainability of such resources at the extraction sites will be negatively affected, as they are not renewable in the short term.

6.4.2 Dust Emissions

During construction, the project will generate substantial quantities of dust at the construction site and its surrounding. The sources of dust emissions will include site preparation and levelling works, and to a small extent, transport vehicles delivering building materials. Emission of large quantities of dust may lead to significant impacts on construction workers and the local residents, which will be accentuated during dry weather conditions.

6.4.3 Exhaust Emissions.

The trucks used to transport various building materials from their sources to the project site contribute to increases in emissions of CO2, NO2 and fine particulate along the way as a result of diesel combustion. Such emissions can lead to several environmental impacts including global warming and health impacts. Because large quantities of building materials are required, some of which are sourced outside Nairobi, such emissions can be enormous and may affect a wider geographical area.

6.4.4 Traffic flow during construction

There is a likelihood of increase in traffic on road adjacent to the site during construction. The trucks used to transport various building materials from their sources to the project site will contribute to increases in emissions of CO2, NOx and fine particulate along the way as a result of diesel combustion. Such emissions can lead to several environmental impacts including global warming and health impacts.

6.4.5 Noise and Vibration

The construction works, delivery of building materials by heavy trucks and the use of machinery/equipment including bulldozers, generators, metal grinders and concrete mixers will contribute high levels of noise and vibration within the construction site and the surrounding area.

6.4.6 Risks of Accidents and Injuries to Workers

Because of the intensive engineering and construction activities including erection and fastening of roofing materials, metal grinding and cutting, concrete work, steel erection and welding among others, construction workers will be exposed to risks of accidents and

injuries. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of metal sheets and collapse of building sections among others.

6.4.7 Solid Waste Generation

Large quantities of solid waste (soil) will be generated as a result of excavation of the site. In addition, additional solid waste will be generated at the site during construction of the building and related infrastructure. Such waste will consist of metal cuttings, rejected materials, surplus materials, surplus oil, excavated materials, paper bags, empty cartons, empty paint and solvent containers, broken glass among others. Such solid waste materials can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on human and animal health.

6.4.8 Energy Consumption

The project will consume fossil fuels (mainly diesel) to run transport vehicles and construction machinery. Fossil energy is non-renewable and its excessive use may have serious environmental implications on its availability, price and sustainability. The project will also use electricity supplied by supplied by Kenya Power Company (KP) Ltd. Electricity in Kenya is generated mainly through natural resources, namely, water and geothermal resources. In this regard, there will be need to use electricity sparingly since high consumption of electricity negatively impacts on these natural resources and their sustainability.

6.4.9 Water Use

The construction activities will require large quantities of water. Water will mainly be used for concrete mixing, curing, sanitary and washing purposes. Excessive water use may negatively affect the water source and its sustainability.

6.5 Positive Environmental Impacts of Operational Activities

6.5.1 Provision of Housing Facilities

The project will provide modern Houses with new and state of the art infrastructure to Nairobi residents. This impact will be significant since Nairobi is currently experiencing a shortage of Housing facilities for its residents.

6.5.2 Employment Opportunities

Some people will be employed by the project as management agents, caretakers, cleaners, security personnel and technicians.

6.5.3 Revenue to National and Local Governments

Through payment of relevant taxes, rates and fees to the government and the local authority, the project will contribute towards the national and local revenue earnings.

6.5.4 Improved Security

Security will be ensured around the project through distribution of suitable security lights and presence of 24-hour security guards. This will lead to improvement in the general security in the surrounding area.

6.6 Negative Environmental Impacts of Operational Activities

6.6.1 Solid Waste Generation

The project is expected to generate enormous amounts of solid waste during its operation phase. The bulk of the solid waste generated during the operation of the project will consist of paper, plastic, glass, metal, textile and organic wastes. Such wastes can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on animal health. Some of these waste materials especially the plastic/polythene are not biodegradable may cause long-term injurious effects to the environment.

6.6.2 Energy Consumption

During operation, the family units will use a lot of electrical energy mainly for domestic purposes including lighting, cooking, running of equipment, running of refrigeration systems, pumping water into reservoirs. Since electricity generation involves utilization of natural resources, excessive electricity consumption will strain the resources and negatively impact on their sustainability.

6.6.3 Water Use

The domestic activities during the operation phase of the project will involve the use of large quantities of water.

6.7 Negative Environmental Impacts of Decommissioning Activities

6.7.1 Solid Waste

Demolition of the project small buildings and related infrastructure will result in large quantities of solid waste. The waste will contain the materials used in construction including concrete, metal, drywall, wood, glass, paints, adhesives, sealants and fasteners. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment.

6.7.2 Noise and Vibration

The demolition works will lead to significant deterioration of the acoustic environment within the project site and the surrounding areas.

6.8 Positive Environmental Impacts of Decommissioning Activities

6.8.1 Rehabilitation

Upon decommissioning the project, rehabilitation of the project site will be carried out to restore the site to acceptable status. This will include replacement of topsoil and re-vegetation that will lead to improved visual quality of the area.

6.8.2 Employment Opportunities

Several employment opportunities will be created for demolition and construction staff.

CHAPTER SEVEN: IMPACTS MITIGATION MEASURES

7.1 Introduction

This chapter highlights the necessary mitigation measures that will be adopted to prevent or minimize significant negative environmental, health and safety impacts associated with the activities of the project during its construction, operation and decommissioning phases. Allocation of responsibilities, time frame and estimated costs for implementation of these measures are presented in the environmental management programme (EMP) in Chapter 8.

7.2 Mitigation of Construction Phase Impacts

7.2.1 Efficient sourcing and Use of Raw Materials

The proponent will source building materials such as sand, ballast and hard core from registered quarry and sand mining firms, whose projects have undergone satisfactory environmental impact assessment/audit and received NEMA approval. Since such firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are considerably well mitigated.

In addition to the above measures, the proponent shall consider reuse of building materials and use of recycled building materials. This will lead to reduction in the number of raw materials extracted from natural resources as well as reducing impacts at the extraction sites.

7.2.2 Minimization of Run-off

The proponent will put in place some measures aimed at minimizing soil erosion and associated sediment release from the project site. These measures will include terracing and levelling the project site to reduce run-off velocity and increase infiltration of rainwater into the soil. In addition, construction vehicles will be restricted to designated areas to avoid soil compaction within the project site, while any compacted areas will be ripped to reduce run-off.

7.2.3 Minimization of Construction Waste

It is recommended that demolition and construction waste be recycled or reused to ensure that materials that would otherwise be disposed off as waste are diverted for productive uses. In this regard, the proponent is committed to ensuring that construction materials left over at the end of construction will be used in other projects rather than being disposed of. In addition, damaged or wasted construction materials including cabinets, doors, plumbing and lighting fixtures, marbles and glass will be recovered for refurbishing and use in other projects. Such measures will involve the sale or donation of such recyclable/reusable materials to construction companies, local community groups, institutions and individual residents or homeowners. The proponent shall put in place measures to ensure that construction materials requirements are carefully budgeted and to ensure that the amount of construction materials left on site after construction is kept minimal.

It is further recommended that the proponent should consider the use of recycled or refurbished construction materials. Purchasing and using once-used or recovered construction materials will lead to financial savings and reduction of the amount of construction debris disposed of as waste.

7.2.4 Reduction of Dust Generation and Emission

Dust emission during construction will be minimized through strict enforcement of onsite

speed controls as well as limiting unnecessary traffic within the project site. In addition, it is recommended that excavation works be carried out in wet weather; and traffic routes on site be sprinkled with water regularly to reduce amount of dust generated by the construction trucks.

7.2.5 Minimization of impacts on traffic flow

The proponent will put in place measures to address such concerns by ensuring that construction vehicles preferably deliver materials during off-peak hours when traffic volume is low. There will also be provision for caution signs on the access road to alert users on construction activities in progress in order to prevent occurrence of accidents. This will be achieved through proper planning of transportation of materials to ensure that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road.

7.2.6 Minimization of Noise and Vibration

Noise and vibration will be minimized in the project site and surrounding areas through sensitization of construction truck drivers to switch off vehicle engines while offloading materials. In addition, they will be instructed to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as churches, schools and hospitals. In addition, construction machinery shall be kept in good condition to reduce noise generation. It is recommended that all generators and heavy- duty equipment be insulated or placed in enclosures to minimize ambient noise levels.

7.2.7 Health and safety of Workers on site

The proponent is committed to adherence to the occupational health and safety rules and regulations stipulated in Occupational Health and Safety Act (Cap 514). In this regard, the proponent is committed to provision of appropriate personal protective equipment such as gloves; helmets, overall as well as ensuring a safe and healthy environment for construction workers by providing sanitary facilities (toilets) and portable water while food will be bought by workers from the nearby hotels.

7.2.8 Reduction of Energy Consumption

The proponent shall ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used.

7.3 Mitigation of Operation Phase Impacts

7.3.1 Ensuring Efficient Solid Waste Management

The proponent will be responsible for efficient management of solid waste generated by the project during its operation. In this regard, the proponent will provide waste handling facilities such as waste bins and skips for temporarily holding domestic waste generated at the site. In addition, the proponent will ensure that such disposed of regularly and appropriately. It is recommended that the proponent put in place measures to ensure that the occupants of the Houses manage their waste efficiently through recycling, reuse and proper disposal procedures.

7.3.2 Minimization of Sewage Release

The proponent will ensure that there are adequate means for handling the large quantities of sewage generated by the units being directed to the Bio digester.

7.3.3 Ensure Efficient Energy Consumption

The proponent plans to install an energy-efficient lighting system for the project. This will

contribute immensely to energy saving during the operational phase of the project. In addition, occupants of the houses will be sensitized to ensure energy efficiency in their domestic operations. To complement these measures, it will be important to monitor energy use during occupation of the and set targets for efficient energy use.

7.3.4 Ensure Efficient Water Use

The proponent will install water-conserving automatic taps and toilets. Moreover, any water leaks through damaged pipes and faulty taps will be fixed promptly by qualified staff. In addition, the tenants will be sensitized to use water efficiently.

7.4 Mitigation of Decommissioning Phase Impacts

7.4.1 Efficient Solid Waste Management

Solid waste resulting from demolition or dismantling works will be managed as previously described.

7.4.2 Reduction of Dust Concentration

High levels of dust concentration resulting from demolition or dismantling works will be minimized as described in Section 7.2.4.

7.4.3 Minimization of Noise and Vibration

Significant impacts on the acoustic environment will be mitigated as described above

CHAPTER EIGHT: ENVIRONMENTAL MANAGEMENT PLAN

8.1 Preamble

This chapter outlines the various environmental impacts envisaged during the execution of this project and provides mitigation measures against each of the identified impacts. This plan is very imperative in supplementing the numerous mitigation measures proposed in the previous chapter. Most significant is the fact that it does provide a responsibility pact in matrix form where the different actors are linked to the roles they will play in the implementation process. The EMP provides a logical framework within which all the identified negative environmental impacts can be consistently and effectively mitigated and monitored.If this is adhered to, the environment will not be compromised at all levels of the implementation process.

However, it is worth noting that from the foregoing analysis, proposed project activities will have some impacts on the biophysical environment, health and safety of project workers, would be staff, members of the public and socio economic well-being of the local residents. Thus, the main focus of this project report is to minimize to negligible levels the negative impacts and maximize the positive impacts associated with the project activities through a programme of strategic and careful execution at all stages of the process.

To this effect therefore, an **Environmental Management and Monitoring Plan (EMP)** has been structured to assist the proponent in mitigating and managing all possible negative environmental impacts associated with the life cycle of the project. The EMP has been developed to provide a basis for an Environmental Management System (EMS; ISO 14001 principles) for the project. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the EMP. As such, the EMP will be subject to a regular regime of periodic review especially through continuous and comprehensive environmental audits.

8.2 Objectives of the Environmental Management Plan

The main objective of the plan is to ensure that there is no compromise on the environmental quality at any cost and at all levels and stages in the implementation of this particular project. Specific objectives include but are not limited to:

8.2.1 Ensuring environmental health and safety within the living environment and minimizing environmental risk during the design, construction and operation phases.

8.2.2 Incorporating environmental principles into development planning, design, construction and operation to enhance environmental conservation and protection as well as promote sustained ecosystem well-being.

8.2.3 To provide mitigation measures against all identified and potential negative impacts resulting from the activities of the proposed development

8.2.4 Creating, facilitating and supporting environmental awareness within the project site and the neighbourhood to inculcate environmental philosophy, ethics and principles among actors and concerned parties in order to achieve sustained environmental quality management.

8.2.5 To assign duties to various actors in the management plan for purposes of enhancing accountability in this project.

8.2.6 To provide a logical framework for environmental management and monitoring.

8.2.7 To provide a reference base for future environmental audits of the comprehensive Residential Development.

8.3 The Environmental Management Plan

This plan provides for the identification of potential impacts, necessary actions, and mitigation measures and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the construction and operational phases of the housing project are outlined in the table below. In general, the table outlines the potential safety, health and environmental impacts associated with the project and detail all the necessary mitigation measures, as well as the individuals responsible for their implementation and monitoring. The EMP will be used as checklist in future environmental audits.

Table 2: **Environmental Management and Monitoring Plan for the proposed Residential Development**

Environmental impact	**Project phase**	**Proposed Mitigation measures**	**Actors**	**Monitoring system**	**Time Frame**	**Verifiable Indicators**	**Cost Estimate Kshs.**
Destruction of water pipes alongthe access road	**Constructio n**	• Proper surveying to identify location of the pipes in consultation with the water provider • Marking of the pipe locations • Reinforcement to protect the water pipes • One point of entry and exit to and from the site for ease of managing the same	Contract or Propone ntWater provider	Inspection and mapping	Initial stagesof the constructio nphase	Reinforce mentsover pipes	No extra costs
Destruction of soil structure and ground profile	**Construction**	• Use of well-maintained and appropriate machinery and tools for site clearing and excavation works • Compacting of loose soil in excavated areas. • Heavy machinery and trucks must be kept off-site in the Contractor's yard • Ensure that new landforms are compatible with neighbourhood development character • Ensure management of excavation activities especially during rainy conditions. • Provide soil erosion control structures to help in management of surface run-offs during construction phase. • Installation of drainage	Contractor Proponent	**Inspection Observation**	**Initial stages of the construction phase**	**-**	**No extra cost- part of project cost**

		structures properly • Proper Landscaping of the site to be done after completion of construction works					
		• Use of dug up loose soil for backfilling • Proper planning of construction activities such that demarcation affects only designated sections					
Interference withthe soil profile	Construction	• Ensure management of excavation activities especially during rainyconditions • Provide soil erosion control structures on the steep side during construction phase. • Use of well-maintained machines and equipment for this very purpose • Installation of drainage structuresproperly • Compact loose soils in excavated areas • Proper Landscaping of the site to be done after completion of construction works	Contractor Proponent Landscape Architect	Inspection		Landscaping Existence storm water drains	No extra cost

	Occupation	• Ensure proper maintenance and efficiency of erosion control channels and measures besides the landscaped lawns • Use of storm water drains	Contractor Proponent	Routine maintenance	-	-	No extra cost
Increased surfacewater run-offs	Construction /Occupation	• Provision of storm water trenches and drains on site • All roof water and surface runoff water to be collected and stored in underground water reservoirs to use • Proper and regular maintenance of drainage systems	Proponent contractor	-	-	Surface waterdrains	No extra cost
Piling of loose soil and other debrison site	**Construction**	• Enclose the site to prevent these waste soils and other debris from spilling over toneighbouring properties, the road reserve and storm water drainage channels	Contractor Proponent		-	-	No extra cost
		• All dug up soil to be removed promptly anddisposed of to appropriate areas approved by the Nairobi City County Government and NEMA • Re-use the soil in backfilling andlandscaping • Construction materials to be supplied on demand and right quantities for use in time					

Fire risk		• All buildings on site to be made of non-combustible material • One 9kg Co2 fire extinguisher shall be stationed at strategic points all-round the premises • Water hydrants should be installed. • All the electrical connections shall be connected to one central emergency stop switch; in addition, they shall be designed by a registered engineer	Station manager Contractor Proponent Project Engineer	Routine checks verification Adherence to design standards of flammable and combustible materials	Design and construction Phases Operation phase	Hydrants, extinguishers and alarm systems	Part of project cost thus no extra cost
Air pollution through exhaust fumes and dust emissions	Construction	• All trucks and any other mode hauling soil sand and other loose materials to and from the site should be covered. • All these trucks must maintain at least two feet of free board to prevent overflow of materials as this is recipe for free fall thus pollution. • The site should be enclosed with dust- proof net • Workers on site to have dust masks • Vehicles and machines to be switched of when not in use on site as roaring	property manager Contactor Proponent	Inspection/ observation	On a daily basis	-Enclosed construction sites -Workers to have dust masks -covered heavy commercial trucks	No extra cost to be incurred as this has been factored in the total project cost

		engines blow up dust and release exhaust fumes • If possible, use of electrically operated machines to reduce exhaust fumes • Control speed of construction vehicles to reduce dust generation • Sprinkling of water on dry soils in excavated areas, pavements and staging areas on site to suppress dust. • Regular maintenance of construction plant and equipment for enhanced efficiency • Use of clean fuels for machines and equipment • Provide barriers such as walls and netting around site boundaries to provide some buffer against dust emissions (where applicable). • Encourage other people to either avoidand or minimize the coming to this siteduring construction works • All pipes leading to the Septic Tank to have P-traps to prevent fowl air from the decomposing wastes coming back to the house.					
Occupational health & safety	Constructio nand Occupation	• All workers and visitors on site to usemandatory protective gear • Unattended entry to the project site tobe restricted • Use of efficient and well maintained machines to lift and transfer materials • Removal of all dangerous materials	Contractor workers Proponent	=	Regularly	=Fire extinguishers =Warning signs =Visible emergency	No extra cost

		that may pose a threat such as metal bars, wires, glass and broken equipment. • Availing of fully equipped first Aid kitties to help address emergencies. • Installation of firefighting equipment at strategic points • Warning signs to all users and visitors be placed at appropriate places • Emergency numbers to be given to all tenants so as there to be efficient response to emergency situations. • Educate construction workers and tenants on health and safety risks and their prevention	Visitors to the site			numbers	
Increased traffic generation	Construction & occupation	• Provide walkways for use by pedestrians to avoid competition between hard and soft traffic • Transportation of construction materials and excavated soil to be carried out during off-peak hours only. • Sensitization of truck drivers to avoid unnecessary road obstruction • Provision of ample parking on-site andplot frontage. • Sign posts to guide motorists to and from the construction site • Deliveries of goods to make use of a 9metre back lane provided for this purpose only	Proponent Contractor	-	From the start of constructio nworks to completion	Enough parking lotsSign posts	No extra costto the proponent

Interference with the privacyof adjacent developments	Construction & Occupation	• Orientation of the premises in relation to adjacent developments to enhanceprivacy. • Screening by use of a net during construction works • Maintaining only the right amount of workers on site at any particular time • The vegetation already around the site to promote privacy	Contractor Project Architect	Frequent inspection	During construction	No complaints from neighbours	No extra costto the proponent
Increase in landUse density	Construction	• Ensure this development blends with the neighbourhood character • Comply with regulatory and legal requirements as per the conditions of the Nairobi City County Government and the Physical & Land Use Planning Act, • Ensure that provision of services such as water and electricity is increased to cater for all tenants.	Proponent Contractor	Inspection	constructionand completion of the structure	Change of user The development to be in harmony with adjacent development	150,000
	Occupation	• Maintenance of landscaped gardens, conservation and management of vegetation and gardens on and around the site	Proponent	Inspection	Weekly	The number of planted trees on site	No extra cost
Noise pollutionand excessive vibrations	Construction	• Comply with the maximum permissible noise levels for construction sites as provided for in the second schedule of the Environmental and coordination (Noise and excessive vibration pollution) control regulations of 2009.	Contractor Proponent	Inspection/ observation	Random	=	No extra cost

		• Use of well-maintained and serviced machines and equipment for this very purpose. • Ensuring that all construction activitiesto be restricted to day time (008- 1700hrs) • Workers in the vicinity of high-level Noise to wear safety & protective gear. • Install portable barriers to shield compressors and other small stationary equipment. • Location of all stationary noise sources from high sensitive primary receptors as far as possible such as the adjoining residential Development					
	Occupation	• No reckless hooting on site • Control events, points or sources of noise • Awareness creation for all visitors to the site not to generate unnecessary noise	Proponent /property manager	Inspection/ observation	Daily	Meets EMCA (Noise and Excessive Vibrations regulations 2008).	No extra cost
Pollution of underground water resources	Construction	• All liquid wastes generated on site tobe channeled to the sewer line • All pipes directing waste water to the sewer to have oil/grease interceptors • Ensure proper maintenance of machines and equipment Maintenance of construction vehicles should be carried out in the contractors yard and not within the site	Contractor Proponent	Inspection	Daily	No water clogged on site	No extra cost

		• Use approved, strong & durable materials for waste water drainage system connections • No waste waters from the site will be drained into the environment at all					
	Occupation	• Ensure sound working of oil interceptors along the drains	Contractor	Inspection	Daily	Oil interceptors along drains.	No extra cost
Increased Waterdemand	Construction	• Construct water reservoirs and rainwater harvesting systems for conservation • Use of tanker water for construction works • Management of water usage for construction and re-use in lawns/gardens. • Avoid unnecessary water wastage • Recycling of water where possible • Install water conserving taps that turn off automatically when water is notbeing used.	Contractor	Inspection/ observation	Random	Water reservoirs Well fitte dwater conservancy taps	No extra cost
	Occupation	• Make use of roof catchments to provide water i.e. for general purpose cleaning and watering of gardens • Install water conserving taps that turn off automatically when water is not being used. • Quick fixing of leaking taps and pipesto avoid wastage of water • Never leave running taps on after use	Property managers Visitors proponen t	Inspection/ observation	Random	Water conservatio ntaps Stored rai nwater	No extra cost

Loss of Habitat and Biodiversity	construction	• Removal of only necessary vegetation where construction works will be carried out • Proper demarcation of the project site to establish only the area that will be affected by the construction works to avoid spilling over to the rest of theplot • Landscaping of the site after construction by planting grass ,flowers and other forms of Vegetation in all open spaces • Encourage terrace gardening (where applicable)	Landscap earchitect Contracto r Proponen t	Inspection/ observatio n	Random	Terrace gardens Natural grasslawns an dtrees	No extra cost
Increased SolidWaste generation	Construction and operation	• Ensure that all the solid waste management during construction and operational phases of the project do comply with the Environmental Management and Coordination (Waste management) regulations of 2006 • Use of construction materials that need minimal packaging to reduce packaging wastes on site • Ensure a continuous review of waste management procedures with changing technology and regulatorychanges. Incorporate suitable facilities for collection, segregation and safe disposal of solid wastes.	Contracto rand Proponen t Nairobi City County Govt	Observation	Daily	Litter free environment Litter bins	10,000

		• Provide bins for solid waste disposal inevery household • Dustbin cubicles must be protected from stray animals and rain • Bins should be regularly cleaned and disinfected • All solid waste to be collected regularly and promptly and safely transported by a private company contracted for this purpose to an appropriate dumping site approved by the County Government of Kiambu • Transportation of the wastes should be in such a way that there will be no reckless dumping and or littering on the road					
Increased liquidwaste Generation	Mostly during occupation	• Ensure that all liquid waste generated on site is channeled to the sewer line • All channels leading from the parking bay to have grease and oil filters and interceptors • Construction works to be done to standard to avoid incidences of spillages and linkages.	Contractor Proponent	"	Randomly	Connection to the sewer line	No extra cost

DECOMMISSIONING IMPACTS					
Expected Negative Impacts	**Recommended Mitigation Measures**	**Actors**	**Time frame**	**Indicators**	**Cost**
Accumulating of solid wastes and other debris on site	• Ensure that all the solid waste management mechanisms during construction and operational phases of the project do comply to the Environmental Management and Coordination (Waste management) regulations of 2006 • All wastes will be collected and carefully transported to approved disposal sites • Wastes generated as a result of facility decommissioning activities will be characterized in compliance with standard waste management procedures. • Disposal locations will be selected by the contractor based on the properties of the particular waste stream and in compliance to NEMA regulations on waste disposal besides the areas set aside by the County Government of Nairobi for this very purpose only. • All buildings, machinery, equipment, structures and tools that will not be used for other purposes should be removed andrecycled/ reused say in other projects • Where recycling/reuse of the machinery, equipment, implements, structures, tools and other waste is not possible, the materials should be disposed to approved dumpsites. • All trucks ferrying wastes from site to be covered using canvas • All these trucks to have 2 feet off-board of wastes to prevent some of the wastes falling off	Proponent Demolition contractor	Throughout	No piling ofwastes on site	50,000

Water pollution	• Elaborate procedures for finding contaminated material duringdemolitions will be established • Covering and proper dumping of excavated materials • Appropriate handling and storage of contaminated material iffound. • Ground contamination and storm water contamination will belimited on site by proper handling and storage of materials and equipment.	Contractor proponent	All through		No extra cost
Air pollution	• The site should be enclosed by dust proof net • Watering of the site and dusty materials to suppress the dustgenerated • 3 months' notice to be given to neighbours notifying them of theintended demolition works • All trucks hauling the debris to be fully covered • Demolition works to be done only during the day between 8am-5pm	Contractor proponent	=	=	=
Noise Pollution	• Use of low noise, efficient and well maintained machinery forthe demolition works • Enclosing the site to help contain the dust • Demolition works to be carried out during the day between8am-5pm	Contractor proponent	=	=	=
Vibrations	• Use of well-maintained and serviced machinery for the demolition works	Contractor proponent	During excavations	=	=

	• Systematic excavations with proper care to avoid unnecessary vibrations				
Loss of vegetation and soil degradation	• Implement an appropriate re-vegetation programme to restore the site to its original status • During the re-vegetation period, appropriate surface water runoff controls will be taken to prevent surface erosion; • Monitoring and inspection of the area for indications of erosion will be conducted and appropriate measures taken to correct any occurrences; • Fencing and signs restricting access will be posted to minimize disturbance to newly-vegetated areas; • Carry out soil tests for contaminants & if need be, scoop out any contaminated soils and replace with uncontaminated soil from another source • Comprehensive Landscaping: Planting of grass, shrubs and other kinds of vegetation on site to restore it to its original status • Rehabilitation of the site to be done in such a manner as to conform to the general site conditions without distorting the character of the wider plot.	Contractor proponent	=	=	40,000
Physical Health hazards	• Unattended entry to the project site during this phase to behighly restricted. • All workers and visitors on site to use mandatory protectivegear • Ensure that safety measures have been effectively integrated and positioned in respective areas of the project to control and	=Workers =Visitors =Contractor =Proponent	=	=	To be determine dby the contractor

	manage fire outbreaks • Hazardous areas shall be suitably protected say using strongrails to avoid occurrence of incidences • The safety of the workers should surpass as a priority of all other objectives in the decommissioning project				
Soil pollution	• Carry out extensive soil tests to identify any soil contaminantsand radioactive substances • Contracting of qualified personnel/experts to carry out the soiltests • Elaborate soil treatment and restoration in case of contamination	Proponent Engineer			30,000
Loss of income andresidence	• An elaborate Environmental Impact Assessment will be carried out by a registered EIA expert for the decommissioning phase activities • A three months' notice to be issued to all individuals who will still be tenants by the time of decommissioning to look for alternative areas of residence • Adapt a project – completion policy: identifying key issues to be considered. • Assist with re-employment and job seeking of the involved workforce. • Compensate and suitably help all those affected by the decommissioning of the project. • Offer advice and counselling on issues such as financial matters.	Contractor proponent	=	=	=

8.4 CONCLUSION

This EIA project report has been prepared and submitted with strict adherence to the provisions of EMCA (Cap 387) and Environmental (Impact Assessment and Audit) Regulations (2003). It provides a comprehensive account of all potential socio-economic and environmental impacts likely to be caused by the execution of the proposed Residential Development. It has further given an analysis of these impacts together with mitigation measures to cushion the environment against potential negative impacts as provided for in the Environmental Management Plan.

As documented in the preceding analysis, the report established that the proposed development is a **Low risk** project and is consistent with the permissible developments in WESTLANDS AREA; Nairobi City County as per the Zoning guidelines of the County Government of Nairobi. In line with this therefore, all the envisaged negative impacts identified will meritoriously be mitigated by the provisions of the Environmental Management Plan; provided that they are adhered to the latter by all parties involved in the execution of this project. The EMP shall be used by the NEMA, City Planning Department and proponent to enforce development control in an attempt to meet statutory regulations. Annual audits shall also be executed to establish efficiency and adequacy of operational systems.

8.5 RECOMMENDATION

In view of the information given above therefore, the consultants considers that the information presented by this report is adequate and accurate to enable NEMA and other relevant institutions and agencies to approve the project and monitor its execution process. The proponent has been briefed of the details of this final report and has agreed to abide by the proposals therein due to the fact that he was actively involved at all stages of its preparation. It is with these considerations that I recommend this project for approval and issuance of NEMA license to the proponent.

REFERENCES

i. Republic of Kenya (2019), **Physical & Land Use Planning Act, No 13 of 2019**

ii. Republic of Kenya (2011), **The Environment and Land Court Act**

iii. Republic of Kenya (2012), **The County Governments Act**

iv. Republic of Kenya (Cap 387), **Environmental Management and Coordination Act,** number 8 of Cap 387

v. Republic of Kenya (2003), Environmental (Impact Assessment and Audit) Regulations 2003

vi. Republic of Kenya (2011) **Urban Areas and Cities Act**

vii. Republic of Kenya (1968), **The Building Code**

viii. Kenya gazette supplement Acts **Penal Code Act (cap 63)**

ix. Republic of Kenya (**2002**), **The Water Act**

x. Republic of Kenya (1972), **Public Health Act (Cap 242)**