ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

FOR THE PROPOSED RESIDENTIAL APARTMENTS ON PLOT L.R NO.1870/85 (NAIROBI/BLOCK 7/57) ALONG RING ROAD PARKLANDS IN PARKLANDS/HIGHRIDGE AREA, WESTLANDS SUB-COUNTY WITHIN NAIROBI CITY COUNTY

NEMA/TOR/5/2/944

G.P.S COORDINATES:

LATITUDE: -1.2576°S
LONGITUDE: 36.8053°E

Prepared in Accordance With:

- Environmental Management and Co-ordination Act, CAP 387
- Environmental (Impact Assessment and Audit) Regulations, 2003
- Legal notice 31of 2019

PROJECT PROPONENT	PREPARED BY:
SEQUOIA CHINA LIMITED **P.O BOX 56768-00100** **NAIROBI**	**GREEN BUILDERS & PLANNING CONSULTANTS LTD** *Consultants In: EIA/EA, Land Use Planning & Feasibility Studies* Vedic House, Mama Ngina St., 6th Floor, Suite 608 **Add:** P.O Box 79170 - 00400 Nairobi **Tel:** +254 704 707 633 **Email:** greenbuildersplanningconsult@gmail.com

AUGUST 2025

DOCUMENT CERTIFICATION

This Environmental Impact Assessment study report has been prepared by **Green Builders & Planning Consultants Limited** (NEMA Reg No. **9571**) in accordance with the Environmental Management and Coordination Act, CAP 387 and the Environmental (Impact Assessment and Audit) regulations 2003 and legal notice 31 of 2019 which requires every proponent undertaking a project specified in legal notice 31 as high risk to undertake Environmental Impact Assessment(EIA) study report for submission to the National Environmental Management Authority (NEMA) for licensing. We the undersigned, certify that the particulars in this report are correct and righteous to the best of our knowledge.

PROJECT PROPONENT:

SEQUOIA CHINA LIMITED

P.O BOX 56768-00100

NAIROBI

NAME: …… …

DESIGNATION: ……..

Signature…….……Date……..……

EIA/EA FIRM OF EXPERTS:

GREEN BUILDERS & PLANNING CONSULTANTS LIMITED

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Signature……Date…..…...……

FACT SHEET

Assignment Name	Environmental Impact Assessment Study Report		
Type of Facility	Proposed residential apartments development.		
Location	on Plot L.R No. 1870/85(Nairobi/Block 7/57) along Ring Road Parklands in Parklands/Highridge area, Westlands Sub-County within Nairobi City County		
County	Nairobi City County		
GPS Coordinates	LATITUDE: -1.2576°S LONGITUDE: 36.8053°E		
Proponent	SEQUOIA CHINA LIMITED		
Address of the Proponent	P.O BOX 56768-00100 NAIROBI		
Summary Project description	In summary, the proposed residential apartments shall have a total of six hundred and forty-four (644) apartment units as follows; Ninety-eight (98) Studio apartment units Three hundred and sixteen (316) One bedroom apartment units One hundred and twenty-four (124) Two-bedroom apartment units One hundred (100) Three-bedroom apartment units Two (2), Three-bedroom duplex apartment units Four (4), Four-bedroom duplex apartment units		
Project Cost	The provided bill of quantities is two billion, four hundred and ninety-five million, nine hundred and thirty-seven thousand nine hundred and ninety-two Kenya shillings only (KShs. 2,495,937,992.28)		
EIA firm of experts	Green Builders & Planning Consultants Limited 0704 707 633	**NEMA Firm Reg No:**	9571

ACRONYMS AND ABBREVIATIONS

EIA - Environmental Impact Assessment

EA - Environmental Audit

EHS - Environmental Health and Safety

EMCA - Environmental Management and Coordination Act

EMP - Environmental Management Plan

NCCG - Nairobi City County Government

PAPs - Project Affected Persons

HA - Hectares

KM – Kilometres

KPLC - Kenya Power and Lighting Company

MOH - Ministry of Health

NEAP - National Environmental Action Plan

NEMA - National Environment Management Authority

NPEP - National Poverty Eradication Plan

OHS - Occupational Health and Safety

PPE - Personal Protective Equipment

PRSP - Poverty Eradication Strategies Paper

SQM – Square Metres

SWM – Solid Waste Management

NCWSC – Nairobi City Water and Sewerage Company

DEFINITION OF ANALYTICAL TERMS

Environmentally Sound Design: Is the design and implementation of activities and projects such that the environmental harm associated with a particular development objective is kept to a practicable minimum.

Positive Impact: A change which improves the quality of the environment (for example by increasing species diversity; or improving the reproductive capacity of an ecosystem; or removing nuisances; or improving amenities).

Neutral Impact: A change which does not affect the quality of the environment.

Negative Impact: A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or property or by causing nuisance.

Significant impact: An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.

Profound impact: An impact which obliterates sensitive characteristics.

Do-Nothing Impact: The environment as it would be in the future should no development of any kind be carried out.

Indeterminable Impact: When the full consequences of a change in the environment cannot be described.

Irreversible Impact: When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

Residual Impact: The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

Synergistic Impact: Where the resultant impact is of greater significance than the sum of its constituents.

Worst Case Impact: The impacts arising from a development in the case where mitigation measures substantially fail.

Cumulative impacts: Are identified as impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions.

Indirect impacts: Are defined as impacts on the environment which are not a direct result of the project, possibly produced some distance away from the project or as a result of a complex pathway.

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EXECUTIVE SUMMARY

Globalisation, urbanisation, migration and technological advancements have continued to drive cities forward right from their infant stages, the cyclic processes, growth, through to their renewal and regeneration. More and more people are moving and positioning themselves in cities for business, work, venturing forth and recreation. The demand for residential developments in Kenyan urban areas has remained under tremendous pressure. Both the government and private sector have had a role to play with the government servicing the land and leaving it to private entrepreneurs to develop. However, the provision of residential housing has not kept pace with the said phenomenon. It is laudable that housing is now a priority for Kenyan government and has increasingly been considered a human right as opposed to a commodity only accessible to the wealthy.

Parklands is a prominent urban neighbourhood located approximately 5 kilometers northwest of Nairobi's Central Business District (CBD). The area is known for its cultural diversity, strategic location, and evolving architectural landscape that blends heritage homes with modern high-rise developments. Parklands is characterized by mixed-use zoning, accommodating:

i. Residential (low-rise and high-rise apartments)

ii. Commercial (offices, shops, malls)

iii. Institutional (schools, hospitals, places of worship)

Due to increasing demand and urbanization, parts of Parklands—particularly Upper Parklands and Highridge—have seen a surge in high-rise developments such as apartments, office towers, and mixed-use complexes.

For a long time, the world over, policy makers directed all the efforts in economic development without due regard to the resource base on which the economic development depend on. As a result, there has been unprecedented environmental degradation due to lack of environmental conservation resulting to unsustainable development. More recently, investors and developers, spurred on by regulators world over, have recognized the need for change in order to safeguard the environment.

Reference to this, environmental concerns have now been integrated in the planning and implementation processes of any proposed projects in Kenya. The key objective is to mitigate conflicts with the environment at the vicinity during implementation and operation phases. In addition, it is now mandatory for Environmental Impact Assessment (EIA) to be undertaken on projects of such

magnitude and nature; to enhance Sustainable Environmental Management as well as controlling and revitalizing the much-degraded environment. The environmental management is regulated by the National Environmental Management Environment (NEMA) in Kenya.

Pursuant to the prevailing legal requirements as envisaged in the Environmental Management and Coordination Act (EMCA), CAP 387 and to ensure sustainable environmental management, the proponent undertook this EIAS on the proposed project's site; and incorporated substantial environmental aspects as advised by NEMA. This EIAS report thus provides relevant information and environmental considerations on the project proponent's intention to seek approval from NEMA for the development of the proposed project. Environmental Experts who are registered by the Authority conducted the assessment

Sequoia China Limited of P.O BOX 56768-00100 Nairobi, herein referred to as "the project proponent" is proposing to undertake construction of a twenty-seven (27) storey residential apartments comprising of six hundred and forty-four (644) residential units with supporting facilities and amenities on Plot No. 1870/85(Nairobi/Block7/57) along Ring Road Parklands in Parklands/Highridge area, Westlands Sub-County within Nairobi City County. The proposed project site lies within geographical coordinates; longitude: -1.2576°S and Latitude: 36.8053°E.

The proposed site is currently secured with a perimeter wall and an access gate occupied by three low-rise developments which shall be demolished to pave way for the proposed residential apartments.

The proposed project shall comprise of;

i. **Basement -2:** comprising of one hundred and thirty (130) parking spaces, underground water storage tank and driveways

ii. **Basement -1**: comprising of one hundred and thirty-four (134) parking spaces, lift lobby and driveways

iii. **Ground floor:** comprising of one hundred and sixteen (116) parking spaces, with extra twenty (20) parking spaces outside the building, a restaurant, kitchen, café, two (2) guard houses, main entrance, reception hall, management office, security office, generator room, transformer room, garbage room, water closets and driveways,

iv. **Mezzanine floor:** one hundred and ten (110) parking bays, two (2) shops, driveways and lift lobby.

v. **First floor:** shall comprise of a swimming pool and twenty-three (23) residential units as follows:

- ✓ Two (2), studio apartment units
- ✓ Nine (9), one bedroom apartment units
- ✓ Eight (8), two-bedroom apartment units
- ✓ Four (4), three-bedroom apartment units

vi. **Typical Second (2^{nd})-twenty fourth (24^{th}) floor:** Each floor shall comprise of twenty-six (26) units as follows;

- ✓ Four (4) studio apartment units
- ✓ Thirteen (13) one bedroom apartment units
- ✓ Five (5) two-bedroom apartment units and
- ✓ Four (4) three-bedroom apartment units

In summary, the twenty-three floors will have a total of five hundred and ninety-eight (598) units

vii. **Twenty fifth floor**; shall comprise of twenty-three (23) units as follows;

- ✓ Four (4) studio apartment units
- ✓ Eight (8), one-bedroom units
- ✓ One (1), two-bedroom apartment units
- ✓ Four (4), three-bedroom apartment units
- ✓ Two (2), three-bedroom duplex apartment units and
- ✓ Four (4), four-bedroom apartment units

viii. **Twenty sixth floor**; shall comprise of the duplex upper floors

ix. **Twenty seventh floor (Roof terrace);** Shall comprise of a gym, yoga, game room, equipment room and water closets

x. **Twenty eighth floor (Upper roof level);** shall comprise of a swimming pool and a restaurant

In summary, the proposed residential development shall have a total of six hundred and forty-four (644) apartment units as follows;

Ninety-eight (98) Studio apartment units
Three hundred and sixteen (316) One bedroom apartment units
One hundred and twenty-four (124) Two-bedroom apartment units
One hundred (100) Three-bedroom apartment units
Two (2), Three-bedroom duplex apartment units
Four (4), Four-bedroom duplex apartment units

The main project components shall include the following:

- Demolition of the existing structures
- Site preparation and clearance
- Soil excavation
- Laying of foundation slab
- Walling
- Plastering and painting
- Development of driveways, walkways and parking areas
- Fit out works
- Connection of utilities i.e. water supply, electricity, drainage systems, waste water and electricity supply
- Laying of pavement blocks
- Site landscaping especially tree planting and landscaped gardens
- Government landscaping/occupation certificate and
- occupation

Socio-Economic (Positive) Impacts of the Project

The proposed development has positive impacts to both the proponent and society in general. The benefits will be experienced during construction and occupation phases. They include the following:

(a) Provision of residential housing units to the growing urban population in Parklands area

(b) The optimal use of land i.e. increased utility of the parcel of land, which is currently underutilised.

(c) Boost local investment; to both government and the proponent.

(d) Creation of market for goods and services. Many secondary businesses are also likely to spring up during the construction phase especially those providing foods and beverages to the construction workers.

(e) Provision of employment during all project phases.

Issues of concern associated with the proposed project implementation

Against the background of the above positive impacts, there are a few issues of concern anticipated from the implementation of the subject project. These shall be experienced during implementation/construction phase, operation/occupation phase and decommissioning phase. They include soil degradation; air quality; noise; oil wastes; strain on water resources; solid and liquid waste management; pressure on existing drainage and public sewer, visual blockage and landscape; traffic; public comfort; occupation, health and safety (OHS) concerns and increased population.

The impacts have been elaborated as follows:

(a) Impact to soil (including soil erosion) especially during excavation of the basement levels

(b) Increased noise and vibration mostly during construction phase.

(c) Pressure on the existing trunk sewer

(d) Impact (constraints/pressure) to the existing infrastructure i.e. water, power, roads among others.

(e) Increased waste generation (both solid and liquid) during construction and operational/occupation.

(f) Increased storm water/ run-off resulting from the roof catchments and as a result of decreased recharge areas, after paving of most areas.

(g) Air pollution as a result of dust particles emanating from cement, excavation and construction activities. Exhausts from the involved machinery will lead to increased levels of noxious gases.

(h) The health and safety of workers and immediate neighbours may be compromised in case of occurrence of incidences, pollution and disturbance

(i) Visual blockage. The proposed develop will to some extent obstruct the line of sunlight due to the presence of the structure.

(j) Privacy concerns; the proposed development shall comprise of a twenty-seven-storey building thus triggering security and privacy concerns to the immediate neighbourhood.

Proposed potential mitigation measures

To minimise the occurrence and magnitude of the negative impacts, mitigation measures have been proposed against each of the anticipated impacts. Other measures have been integrated in the project designs with a view to ensuring compliance with applicable environmental laws and guidelines. The measures include the following:

i. During Construction Phase

(a) Minimising air pollution (suppressing dust) and erosion by the agents of soil erosion through soil compaction and utilisation of water sprays (on loose soils on all unpaved access paths/roads, cleared surfaces), utilisation of covered trucks, and netting of construction site.

(b) Erection of warning / informative signs at the site during the implementation phase, and traffic control along the connecting road.

(c) Minimising strain on water supply (surface and groundwater sources) by, employing water conservation measures such as water reuse, rainwater harvesting, use of run-off, and reduction or avoidance on misuse of water.

(d) Reducing noise pollution through:

i) installation of portable barriers to shield compressors and other small stationary equipment (where necessary);

ii) sensitising workers on the need to switch off engines whenever possible;

iii) Ensuring machinery are well maintained through regular tuning and maintenance to minimise or avoid noise emanating from friction of rubbing metal parts;

iv) Installation of silencers whenever possible;

v) Ensuring work is carried out between specified time i.e. 7a.m. to 6p.m.

(e) Minimising emission of noxious fumes through:

i) proper and regular tuning and maintenance of construction machinery/equipment;

ii) reduction/control of vehicle/machinery idling.

(f) Construction machinery and vehicles maintenance should be conducted in appropriate and designated service bays to reduce chances of contaminating the environment by resulting oils and greases. Any of such oils should be collected and disposed appropriately.

(g) Workers should be provided with full personal protective gear (PPE) to safeguard their health and safety; and, they should be sensitised on health, safety and environmental conservation aspects.

(h) The site should be fenced off during construction to keep off animals and the general public, so as to safeguard their health and safety.

(i) Provision of sound waste management systems and procedures. During implementation phase, the contractor should put in place effective and efficient waste management systems in compliance with the legal framework of Kenya. This includes providing acceptable sanitary conveniences to the workers during the construction.

(j) Developer will work with the immediate neighbours to ensure air, noise and land pollution levels are either avoided or kept to the minimal, and the overall health and safety of the immediate environment is safeguarded.

(k) The project design should incorporate privacy measures

ii. During Operation Phase

(a) Minimising strain/pressure on the water supply infrastructure by promoting water efficiency through rainwater harvesting, minimising water consumption/ misuse and using recycled water.

(b) Managing surface drainage by developing and implementing a storm water management design that closely emulates the existing natural "pre-development" hydrological systems, as well as applies the principal of managing (the quantity and quality of) storm water at the source. With respect, emphasis should be on:

i. Storm water drainage, on-site infiltration, and ground water recharge by making use of methods, which closely emulate natural system by incorporating re-vegetation of the site and porous paving in the design.

ii. Maximising recycling and reuse of water. This includes designing a storm water management system which, excludes discharge into the designed sewerage system so as not to put extra burden on this system; but harvests, stores and reuses the rainwater falling within the site. This would greatly enhance efficient use of portable water within the site, as well as contribute to the project's compliance with the Country's provision on climate change adaptation and mitigation measures.

Lastly, where drain channels are considered in the design, they should be well-designed and installed to harmonise management of the resulting storm water within the site. During operation phase, they should be regularly maintained and covered with gratings to avoid accidents and dirt entry.

(c) Comprehensive landscaping on completion of the proposed development to prevent soil erosion and upgrade the site to its appropriate environmental standard.

(d) There a trunk public sewerage infrastructure around the proposed construction site managed by NCWSC. In compliance with the applicable legal framework of Kenya, the sewage generated from the completed development shall be managed by connecting to the existing trunk sewer line This system is regularly maintained and closely monitored and evaluated to ensure its efficiency by NCWSC.

iii. During both construction and operation phases

(a) Careful sitting, planning and implementation processes- to ensure that it is sympathetic to its surroundings and is in line with County Government's Physical Planning and Construction standards.

(b) To safeguard against environmental and human health and safety risks, effective emergency response plans should be adapted during both construction and operation phases. There should be a specific area for hazardous material storage, machinery maintenance activities and refuelling; and, these should be clearly indicated and adhered to.

(c) Adapt the proposed Environmental Management and Monitoring Plans involving all relevant stakeholders during implementation phase and inhabitants, during operation phase.

Project Cost Estimate

The proponent has undertaken a preliminary estimate of the total project cost using experienced consultants. The provided bill of quantities is two billion, four hundred and ninety-five million, nine hundred and thirty-seven thousand nine hundred and ninety-two Kenya shillings only (KShs. 2,495,937,992.28)

Conclusion and Recommendations

The analysis of the EIA study indicates that the proposed project has significant benefit to the local and national housing sector. The analysis reveals that the benefits far outweigh the associated costs and negative impacts. The benefits include availability of quality modern residential units, creation of employment opportunities, increased utility of the land, creation of employment opportunities especially during project implementation phase, increase in government revenue and improvement of local standards of living. Nevertheless, the project will come with some negative impacts such as increased pressure on existing infrastructure, pollution (to Air, Water, soil) mostly during construction phase, increased waste (solid and liquid) generation and effect on ecology (flora) and fauna.

In relation to the proposed mitigation measures that will be incorporated during implementation and occupation phases; the project's input to the Kenya's housing sector; and cognizance of the fact that the project proponent is environmentally conscious**,** the subject project is beneficial and important for a developing country (like Kenya). It is our recommendation that the proponent be granted an EIA study license to implement the proposed project. Major concerns should nevertheless be geared towards minimising the occurrence of impacts that would degrade the general environment. This will however be overcome through close following and implementation of the outlined Environmental and Social Management and Monitoring Plans (ESMMPs); which have been strategically packaged with key environmental sustainability elements, tailored toward enhancing the adoption of *Integrated Ecosystem Management (IEM)*. This will form the (now) widely accepted keystone of the environmental action agenda.

CHAPTER ONE: INTRODUCTION

1.1 Background Information

Parklands is a prominent and diverse residential and commercial neighborhood located within Westlands Sub-County in Nairobi City County. Situated just northwest of Nairobi's Central Business District (CBD), Parklands is known for its strategic location, multicultural population, and mix of urban amenities. Situated northwest of Nairobi's Central Business District (CBD), the area is known for its strategic location, multicultural population, and mix of urban amenities. Originally developed as a residential area for the Asian community during the colonial period, it has grown into a vibrant urban hub with a mix of residential homes, apartment complexes, hospitals (such as Aga Khan University Hospital), schools, religious centers, shopping malls, and office blocks. The area is characterized by both low-rise and high-rise developments, with ongoing urbanization gradually transforming its skyline.

The principal measure of sustainable development is that all activities which are carried out to achieve development must take into account the needs of environmental conservation. The sustainability of the ecosystem requires the balance between human settlement development and the natural ecosystem, which is a symbiotic relationship. This can be achieved through careful planning and the establishment of appropriate management systems. In modern times, the need to plan activities has become an essential component of the development process. Consequently, a number of planning mechanisms have been put in place to ensure that minimum damage is caused to the environment. Environmental planning is also integrated with other planning processes such as physical planning, economic planning, and development planning. Environmental Impact Assessment (EIA) is considered part of environmental planning. EIAs are undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority. In Kenya, the competent authority is the National Environment Management Authority (NEMA).

As part of the EIA process, it is necessary to devise alternatives to avoid undesirable impacts. Besides the alternative, identification of impacts may also lead to the development of mitigation measures i.e. means of reducing the impacts. As a tool of environmental planning, E.I.A is therefore precautionary in nature. E.I.A is neither anti-development nor does it stop actions which impact the environment. It only requires that those impacts be considered. Most development activities impact the environment hence a "no impact" interpretation of environmental impact assessment could lead to no

development. But a "considerable impact" interpretation of E.I.A will lead to better development. If environmental impacts are ignored, the project may not be sustainable in the long-run, in which case the money invested in it will have been wasted.

Pursuant to the prevailing legal requirements as envisaged in the EMCA 1999 and to ensure sustainable environmental management, the proponent contracted the services of Registered NEMA firm of experts to carry out an Environmental Impact Assessment Study for the proposed development. This EIA study report thus provides relevant information and environmental considerations on the project proponent's intention to seek approval from NEMA.

1.2 Objectives of the EIA

Environmental Impact Assessment (EIA) is a process having the ultimate objective of providing decision makers with an indication of the likely environmental consequences of a proposed activity. The main objectives of this EIA therefore include the following:

(a) To determine environmental compatibility of the proposed project

(b) To identify and evaluate the significant environmental and social impacts of the proposed project

(c) To evaluate and select the best project alternative from the options available

(d) To incorporate environmental management plans and monitoring mechanisms

(e) To assess the environmental costs and benefits of the project to the society

These objectives are based on ensuring that the environmental concerns are integrated in the proposed project activities in order to contribute to the overall sustainable development. Other objectives include;

- To identify potential environmental impacts of the proposed project; both positive and negative
- To assess the significance of these impacts to the environment and other stakeholders
- To assess the relative importance of the impacts of alternative plans to the proposed project.
- To propose mitigation measures for the significant negative impacts of the proposed project on the environment and all involved stakeholders.
- To propose measures that will enhance the positive impacts of the proposed project to the environment and all involved stake holders

- To generate baseline data for monitoring and evaluation of how well the mitigation measures are being implemented during the proposed project cycle;
- To present information on the impact of alternatives;
- To present results of the EIA in such a way that they can guide informed decision

1.3 Terms of Reference (TOR)

This Environmental Impact Assessment considered the following aspects and others that proved of significance during the study.

(a) To hold appropriate meetings with the project proponent to establish the procedures, define requirements, responsibilities and a time frame.

(b) To produce an EIA study report that contains among other issues potential negative and positive impacts and recommendations of appropriate mitigation measures to minimize or prevent adverse impacts

(c) To carry out a systematic environmental assessment study at the proposed project site and the surrounding area.

(d) To provide a description of the proposed activities throughout the entire implementation process of the project with a special focus on potential impacts to the surrounding environment and facilities.

(e) To develop an Environmental Management Plan for the proposed project.

1.4 Scope of EIA Study

The study was conducted to evaluate the potential and foreseeable impacts of the proposed development. The physical scope is limited to the proposed site and the neighbouring areas/environment as they may be affected by or may affect the proposed project. Any potential impacts (localized or delocalized), are also evaluated as guided by EMCA CAP 387 and the Environmental (*Impact Assessment and Audit*) Regulations 2003.This study report includes an assessment of impacts of the proposed sites and its environs with reference to the following;

(a) Description of the proposed project

(b) Baseline information (Biophysical and Socio-Economic environment, land use and zoning approval, etc.).

(c) Assessment of the potential environmental impacts on the project area.

(d) A review of the policy, legal and administrative framework.

(e) Development of the mitigation measures and future monitoring plans.

(f) Proposition of alternatives.

(g) Occupational Health and Safety -OHS

1.5 Methodology

Following a preliminary visit of the proposed site, the following was undertaken: -

(a) Screening of the project, a process that identified the project as being high risk as per Legal Notice 31 of 2019.

(b) A scoping exercise that identified the key issues to be addressed.

(c) Documentary review on the nature of the proposed activities, policy and legal framework, environmental setting of the area and other available relevant data/information.

(d) Public participation and consultation-detailed discussions with the project affected persons, stakeholders, proponent and architects.

(e) Physical investigation of the site and the surrounding areas using a pre-prepared checklist identifying possible environmental and human safety issues that are likely to be affected,

(f) Reviewing the proposed project designs and implementation plan/schedules with a view to suggesting suitable alternatives,

(g) Developing an environmental management plan outline with responsibilities, schedules, monitorable indicators and time frames among other aspects,

A comprehensive report including issues as listed in the Environmental (Impact Assessment) Regulations 2003.

1.6 Need for the Project

The demand for housing in Nairobi County has surged due to rapid urbanization and population growth. Kenya faces an annual housing demand of approximately 250,000 units, yet only about 50,000 are supplied each year, resulting in a significant shortfall. To address this, the government has initiated

an Affordable Housing Programme aiming to construct 250,000 houses annually. However, challenges such as high construction costs, limited land availability, and infrastructure constraints persist. Parklands area in general is experiencing a notable transformation characterized by the development of high-rise residential and mixed-use projects. Sitting approximately five (5) kilometres from the CBD, the area has strong tenant base including young professionals, medical staff (AGH), experts, and international students. The proposed residential apartments will therefore offer modern housing units and amenities, security to the medical tourism and the corporate staff.

1.7 National Housing Policy and Housing Needs in Kenya

Kenya's housing sector faces significant challenges, including a substantial housing deficit, affordability issues, and inadequate infrastructure. The National Housing Policy, articulated in Sessional Paper No. 3 of 2016, serves as the government's strategic framework to address these challenges and fulfill the constitutional right to accessible and adequate housing. The National Housing Policy: Sessional Paper No. 3 of 2016 aligns with Article 43(1)(b) of the Constitution of Kenya, 2010, which guarantees every person the right to accessible and adequate housing and reasonable standards of sanitation. The policy emphasizes the progressive realization of this right through legislative, policy, and other measures, including setting standards with key objectives including;

i. Enhancing Access to Affordable Housing
ii. Improving Infrastructure and Basic Services: Ensuring that housing developments are accompanied by adequate infrastructure and services.
iii. Strengthening Institutional Frameworks: Establishing effective institutions to oversee housing development and regulation.
iv. Promoting Sustainable Urban Development: Encouraging environmentally sustainable practices in housing and urban planning.

Kenya faces an estimated housing deficit of over 2 million units, with an annual demand for approximately 244,000 new units. However, the current supply remains below 50,000 units per year with key challenges including;

i. Rapid urbanization which has led to the proliferation of informal settlements, with about 61% of urban households living in slums
ii. Limited Access to Housing Finance
iii. High Cost of Construction and Land

The government continues to prioritize affordable housing, integrating it into broader economic transformation agendas. Efforts are being made to streamline building codes, simplify permit processes, and enhance property registration systems to facilitate housing development. Addressing Kenya's housing challenges requires sustained commitment, innovative financing solutions, and inclusive policies that cater to the needs of all income groups

1.8 EIAS Methodology

Following a preliminary visit of the proposed site, the following was undertaken: -

(h) Screening of the project, a process that identified the proposed project categorized as high-risk project as per Legal Notice 31 of 2019

(i) A scoping exercise that identified the key issues to be addressed in the assessment.

(j) Documentary review on the nature of the proposed activities, policy and legal framework, environmental setting of the area and other available relevant data/information.

(k) Public participation and consultation-detailed discussions with the immediate neighbours, proponent and architects.

(l) Physical investigation of the site and the surrounding areas using a pre-prepared check-list identifying possible environmental and human safety issues that are likely to be affected,

(m) Reviewing the proposed project designs and implementation plan/schedules with a view to suggesting suitable alternatives,

(n) Developing an environmental management plan outline with responsibilities, schedules, monitorable indicators and time frames among other aspects,

A comprehensive report including issues as listed in the Environmental (Impact Assessment) Regulations 2003.

CHAPTER TWO: PROJECT DESCRIPTION

2.1 Project Proponent

The project proponent is Sequoia China Limited of P.O BOX 56768-00100 Nairobi, Kenya

2.2 The location of the project and Site description

The proposed residential apartments shall be implemented on Plot No. 1870/85(Nairobi/Block 7/57) along Ring Road Parklands in Parklands/Highridge area, Westlands Sub-County within Nairobi City County. The proposed site is currently secured with a perimeter wall and an access gate occupied by three low-rise developments which shall be demolished to pave way for the proposed residential apartments. The proposed project site lies within geographical coordinates; longitude: -1.2576°S and Latitude: 36.8053°E.

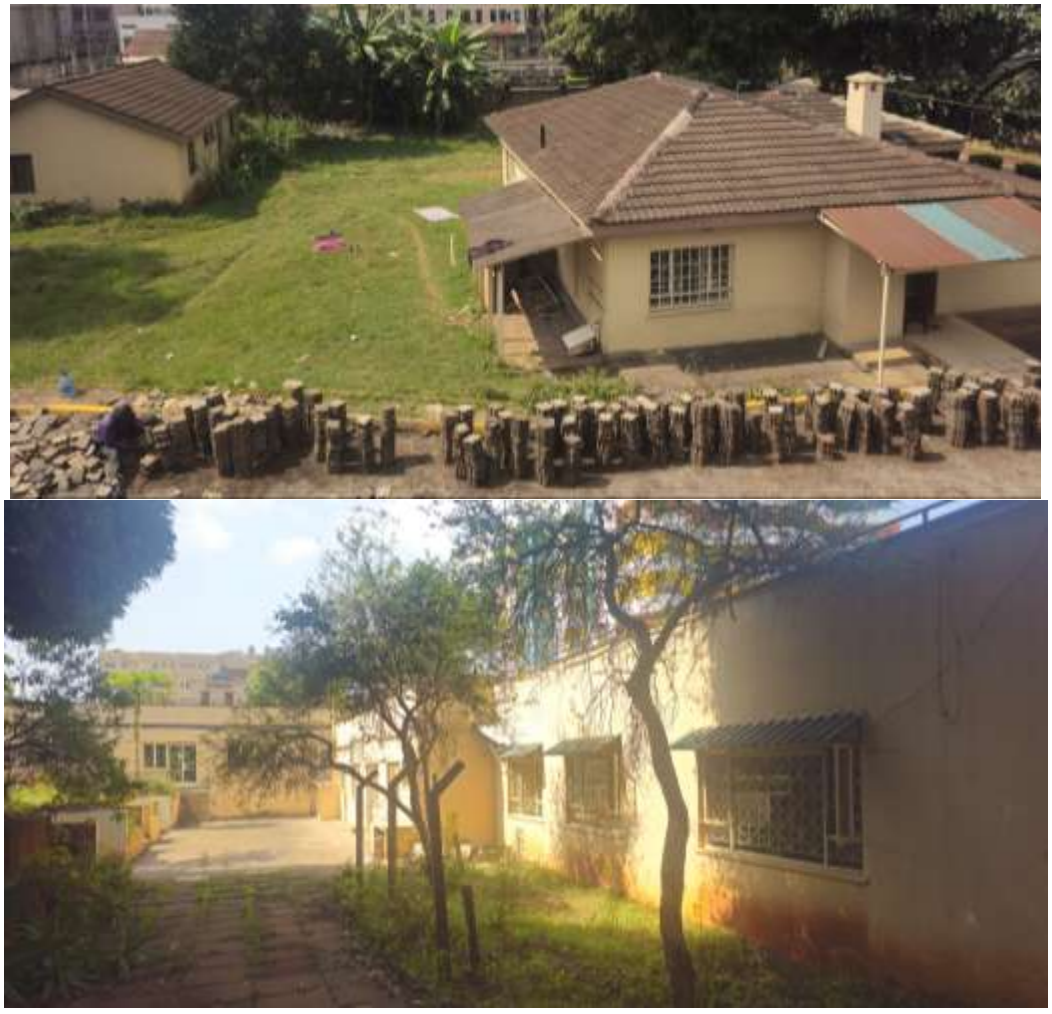


Image 1 &2: Showing some of the existing structures on the proposed project site

Parklands area is a rapidly urbanizing suburb of Nairobi presenting a strategic location due to the economic, social, and planning factors supporting modern high-rise residential developments. The proposed project neighbourhood comprises of:

a) **Emergence of High-Rise residential and commercial developments;**

Parklands area in general is experiencing a notable transformation characterized by the development of high-rise residential, commercial and mixed-use projects. This shift is driven by its central location and accessibility as well as the growing demand for modern, secure, and serviced housing units, especially among middle and upper-income earners, expatriates, and professionals. The developers are leveraging vertical growth due to high land value and Nairobi City County. Some of the high-rise developments in the neighbourhood include; Kingfisher Nest, The Mandrake, ongoing construction of Sunset Park, ongoing construction of 1870 West Park and ongoing construction of high-rise commercial development adjacent to Westgate shopping mall.

b) **Low-rise residential developments.** Some low-rise residential developments including town houses, maisonettes and bungalows still exist within the proposed project neighbourhood. These structures are remnants of the area's earlier zoning character.

c) **Upcoming developments**. Several residential, commercial or mixed-use high-rise projects are in the pipeline, aiming to provide additional housing and commercial options that align with the area's upscale positioning.

d) **Hospitality establishments**; the proposed site neighborhood comprises of several hospitality establishments such as; Kingfishers Nest Hotel, Land Mark suites, Progressive Pakk Hotel among others

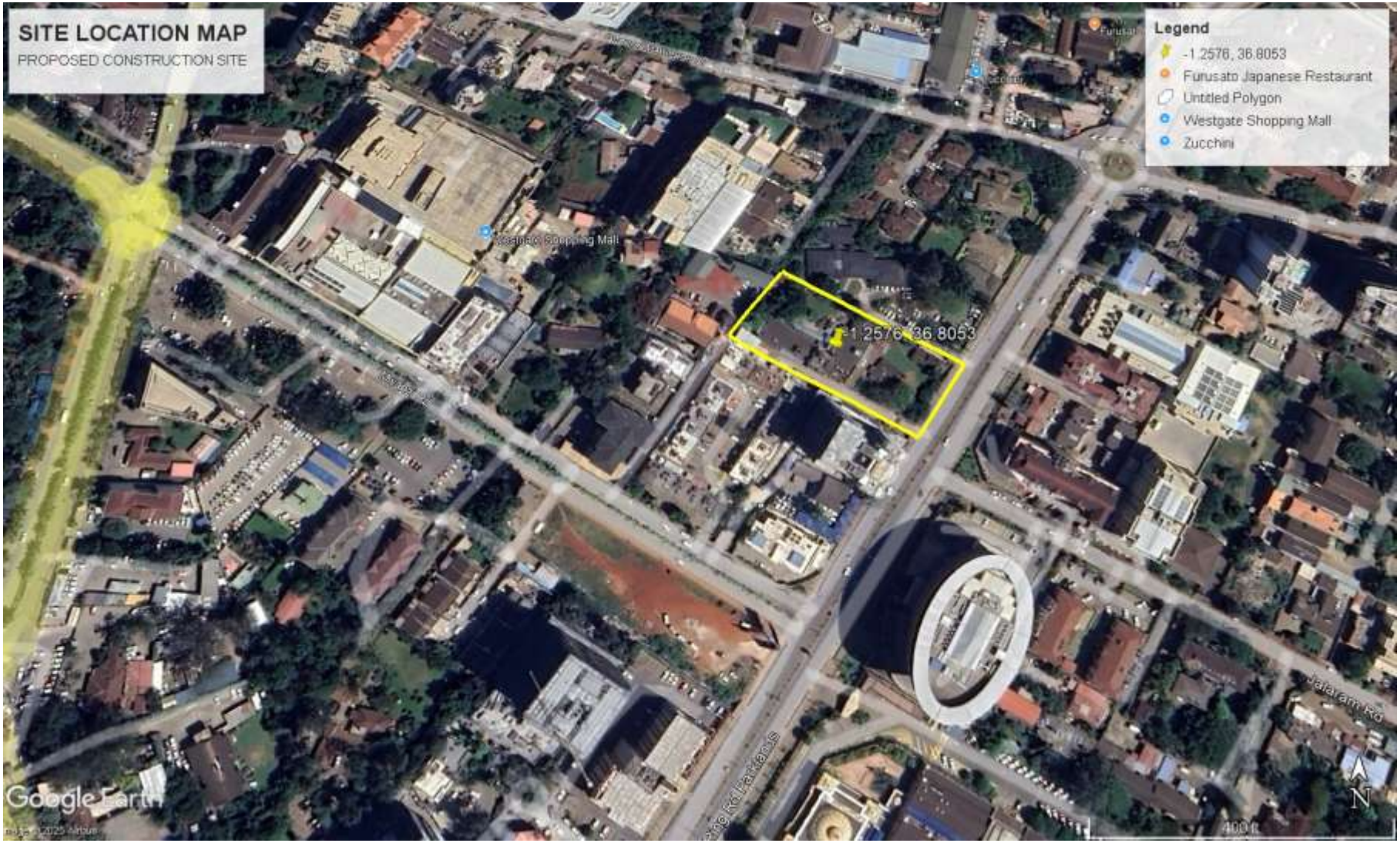
e) **Commercial developments**; The proposed project neighbourhood area is transforming to high-rise mixed-use developments. These included commercial spaces i.e. offices and retail spaces to support businesses in the area I.e. The Oval, Empress office suites, The Mandrake, The promenade, Apollo Centre

f) **Social amenities and institutions:** the proposed project neighbourhood is developed with various social amenities to serve the growing population. These includes;

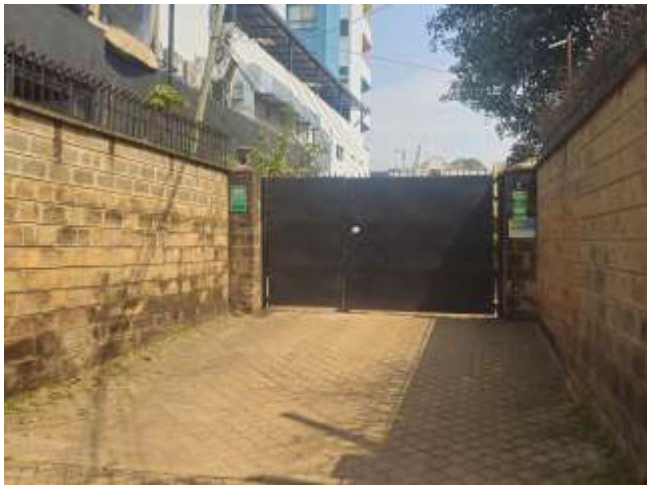
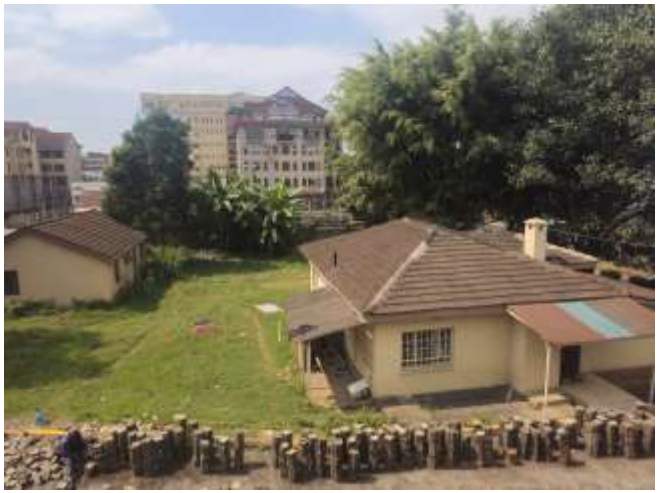
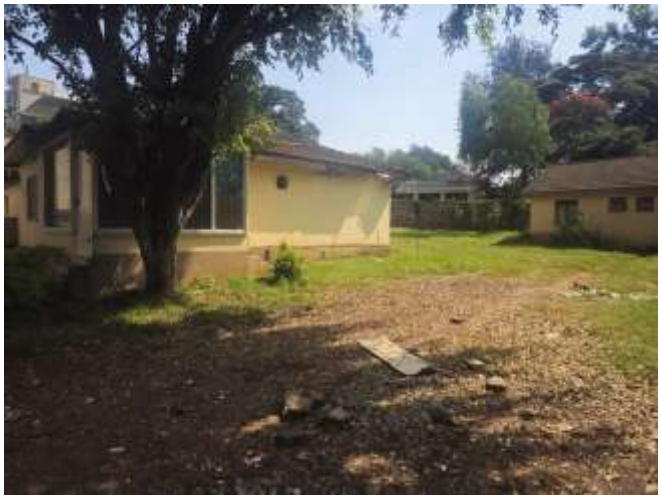
- ✓ Health institutions such as the Aga Khan Hospital
- ✓ Education institutions; visa Oshwal Centre
- ✓ Shopping and leisure: Sarit Centre and Westgate Mall

g) **Infrastructure;** Developments in Parkland are supported by robust infrastructure including;

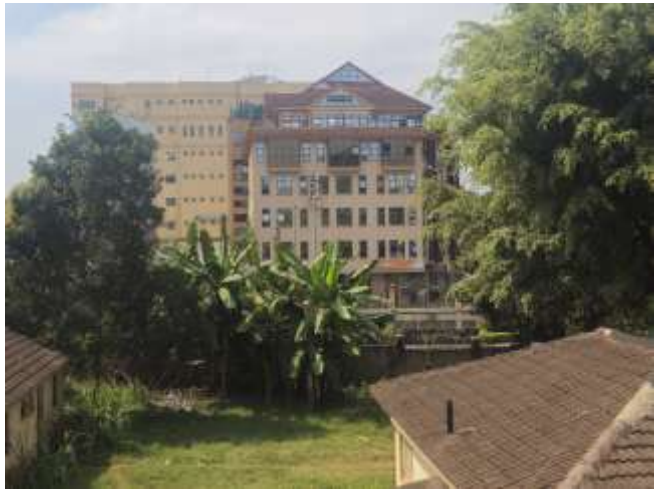
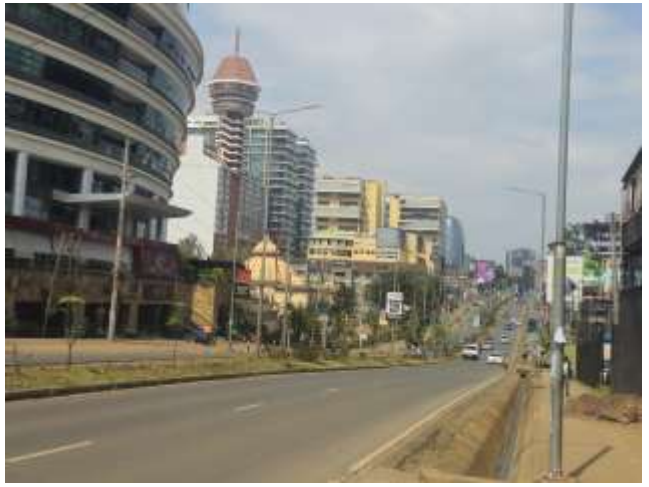
- ✓ **Proximity to Major Roads**: Parklands is bordered by key arterial roads such as; Waiyaki Way, Limuru Road, Ojijo Road, Forest Road (Wangari Maathai Road). Further, other major roads include; Ring Road, Parklands, General Mathenge, Mwanzi road among others.
- ✓ **Sewerage and Wastewater Management;** Parklands area is served by a Main sewer line connectivity managed by NCWSC network.
- ✓ **Electricity Supply:** Kenya Power provides reliable grid access in Parklands area.
- ✓ **Internet and Telecommunications:** The area is well-serviced by fiber-optic networks from providers like Safaricom, Zuku, and JTL



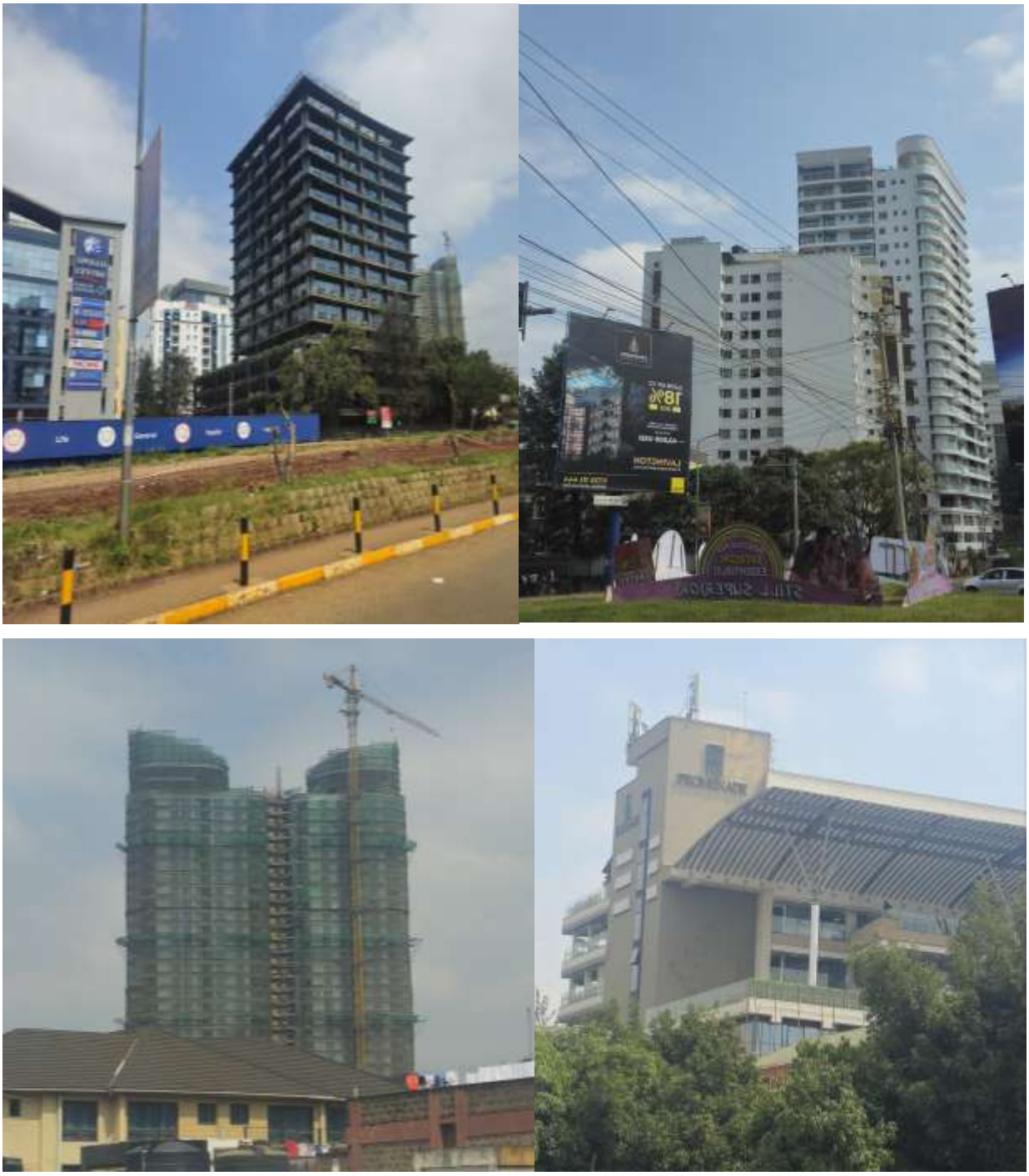
Site Location Map (Source: Google Earth 2025)

Images 3,4 and 5 showing the proposed project site access gate from the Ring Road Parklands Road, existing structures and vegetation character

Images 6,7 and 8 showing the immediate neighbourhood character including Kingfishers Nest hotel, neighbouring maisonettes and hotel developments



Some of the mixed-use high-rise developments within the project area.

2.3 Site ownership, size, zoning and land use

The proposed project shall be implemented on Plot L.R No. 1870/85 (Nairobi/Block 7/57) measuring approximately 0.4534 Hectares. The plot is situated along Ring Road Parklands adjacent to Kingfisher Nest in Parklands/Highridge area, Westlands Sub-County within Nairobi City County. The proposed project site lies within geographical coordinates of longitude: -1.2576ºS and Latitude: 36. 8053oE.The subject plot is under leasehold by the government of Kenya to Sequoia China Limited

The copies of land ownership documents are annexed.

2.4 Nature and Design Components of the proposed Project

2.4.1 Project description

The proposed construction involves construction of a twenty-seven (27) storey residential apartments comprising of six hundred and forty-four (644) residential units with supporting facilities and amenities on Plot No. 1870/85(Nairobi/Block 7/57) along Ring Road Parklands in Parklands/Highridge area, Westlands Sub-County within Nairobi City County.

Currently, the site is secured with a perimeter wall and an access gate occupied by three low-rise developments.

The proposed project shall comprise of;

i. **Basement -2:** comprising of one hundred and thirty (130) parking spaces, underground water storage tank and driveways

ii. **Basement -1**: comprising of one hundred and thirty-four (134) parking spaces, lift lobby and driveways

iii. **Ground floor:** comprising of one hundred and sixteen (116) parking spaces, with extra twenty (20) parking spaces outside the building, a restaurant, kitchen, café, two (2) guard houses, main entrance, reception hall, management office, security office, generator room, transformer room, garbage room, water closets and driveways,

iv. **Mezzanine floor:** one hundred and ten (110) parking bays, two (2) shops, driveways and lift lobby.

v. **First floor:** shall comprise of a swimming pool and twenty-three (23) residential units as follows:

- ✓ Two (2), studio apartment units
- ✓ Nine (9), one bedroom apartment units

- ✓ Eight (8), two-bedroom apartment units
- ✓ Four (4), three-bedroom apartment units

vi**. Typical Second (2nd)-twenty fourth (24th) floor:** Each floor shall comprise of twenty-six (26) units as follows;

- ✓ Four (4) studio apartment units
- ✓ Thirteen (13) one bedroom apartment units
- ✓ Five (5) two-bedroom apartment units and
- ✓ Four (4) three-bedroom apartment units

In summary, the twenty-three floors will have a total of five hundred and ninety-eight (598) units

vii. **Twenty fifth floor**; shall comprise of twenty-three (23) units as follows;

- ✓ Four (4) studio apartment units
- ✓ Eight (8), one-bedroom units
- ✓ One (1), two-bedroom apartment units
- ✓ Four (4), three-bedroom apartment units
- ✓ Two (2), three-bedroom duplex apartment units and
- ✓ Four (4), four-bedroom apartment units

viii. **Twenty sixth floor**; shall comprise of the duplex upper floors

ix. Twenty seventh floor (Roof terrace); Shall comprise of a gym, yoga, game room, equipment room and water closets

x. Twenty eighth floor (Upper roof level); shall comprise of a swimming pool and a restaurant

In summary, the proposed residential development shall have a total of six hundred and forty-four (644) apartment units as follows;

Ninety-eight (98) Studio apartment units
Three hundred and sixteen (316) One bedroom apartment units

One hundred and twenty-four (124) Two-bedroom apartment units

One hundred (100) Three-bedroom apartment units

Two (2), Three-bedroom duplex apartment units

Four (4), Four-bedroom duplex apartment units

The main project components shall include the following:

- Demolition of the existing structures
- Site preparation and clearance
- Soil excavation
- Laying of foundation slab
- Walling
- Plastering and painting
- Development of driveways, walkways and parking areas
- Fit out works
- Connection of utilities i.e. water supply, electricity, drainage systems, waste water and electricity supply
- Laying of pavement blocks
- Site landscaping especially tree planting and landscaped gardens
- Government landscaping/occupation certificate and
- Occupation

2.4.2 Clearing and Preparation of the Project Site

The existing ground situation will be altered through clearing of existing vegetation and decommissioning of the existing structures to pave way for implementation of the proposed apartments. The project proponent should strive to spare the mature trees on site not affected by the building line. Further, there are plans to plant trees and flower gardens to create a green cool environment

2.4.3 Access Road

The proposed development site is served by Ring Road Parklands Road. Adequate parking spaces shall be provided within the proposed project to avoid street parking.

2.4.4 Trunk Infrastructure and Utilities

Water Supply: The proposed development will receive water distributed and managed by NCWSCO. Further, an onsite borehole shall be drilled to provide reliable water supply. This will be supplemented by provision of adequate water storage tanks, harvesting of rain water and recycling of waste water.

Foul Water Drainage: The proposed development will generate substantive amount of waste water per day. The waste water generated will be discharged into the existing trunk sewer line within the locality

under the Nairobi Sewer Network.

Storm Water Drainage: The proposed development will generate enormous surface water. It is therefore recommended that adequate and well drainage channels be provided to accommodate the increased discharge. The flow of the storm water has been well captured in the plans and the proponent plans to develop adequate water storage tank for storage of harvested water.

Solid Waste Disposal: The proposed project will generate enormous solid waste. It is recommended that NEMA & County licensed private waste handlers be contracted to handle the waste. It is further recommended to have one common point within the premises to store the waste before final collection.

Electricity Supply: The proposed development will be connected to the Kenya Power and Lighting Company power supply line. The KPLC electricity supply lines are already available within the neighbourhood of the proposed project site. There will be a backup generator in case of Power blackout.

2.4.7 Landscaping and Tree Planting

The project will involve clearing of few vegetation and excavation of soil material. The site development involves cut and fill arrangement; whereby excavated material is used for backfilling. Any excess material will be disposed off-site.

The project site will be landscaped according to scheme plan. This will entail establishment of flower gardens, planting of trees, grass and related ground cover to compensate for any cleared vegetation and to improve general aesthetics of the estate.

2.4 Construction Activities and Inputs

The construction activities shall begin once the proponent obtains all relevant approvals such as NCCG, NEMA license, NCA among others. Site clearing, demolition works, setting out and excavations works will then proceed. Materials from the excavations of the ground and foundation work will be reused for earth works and landscaping.

The proposed development will be constructed based on applicable building standards of Kenya. Other building standards will be incorporated. They include Building Code and the British Building Standards *BS 8110*, *BS 5950, BS4449, BS4461 etc.* The development shall also incorporate environmental guidelines, health and safety measures. All the construction inputs shall be obtained from licensed dealers. The following will be required for successful implementation of construction activities. Construction tools and equipment including machinery mainly transportation vehicles will be used for the transportation of materials and in the execution of the proposed works.

2.5.1 Inputs during Construction

a. **Construction raw materials** i.e. sand, cement, stones, crushed rock (gravel/ ballast), ceramic tiles and other ceramic fittings, steel and wooden fixtures and fittings, glass, steel metals, timber, roofing materials, painting materials among others. All these should be obtained from licensed dealers and especially those that have complied with the environmental management guidelines and policies.

b. **Construction machines** including machinery such as excavators, trucks, concrete mixers, and tools and other relevant construction equipment. These will be used for the excavation, transportation of materials, clearing of the site and construction debris. Most of the machinery will use electrical and petroleum products to provide energy.

c. A construction labour force of both skilled and Semi-skilled workers. These will require services such as energy, water supply and sanitation facilities.

d. Water for construction purposes.

e. Power from the mains grid or provided by generators.

2.5.2 Construction activities include the following

- Procurement of construction materials from approved dealers.
- Transportation of construction materials and debris using heavy and light machinery
- Appropriate Storage of the construction materials.
- Demolition of the existing bungalow
- Site clearing, excavation and filling and laying of foundation
- Construction works i.e. masonry works/building works including, finishes, fixtures and fittings.
- Disposal of debris/ materials. All debris and excavated materials will be dumped on sites approved by the county government.
- Electrical, civil, and water engineering and sanitary works. These will be done by qualified and registered expertise.
- Landscaping works and earth works mostly on completion of the proposed development.
- Completion of the development and occupation.

2.5.3 Project implementation sequencing/Phasing

i. Pre-construction stage

a) Plan preparation and seeking of the appropriate approvals from the relevant authorities which has been done

b) Appraisal of baseline condition to determine supply and demand for required infrastructural utility services.

c) EIA study Report preparation including the necessary approvals.

ii. Construction stage

a) ***Establishment of related works and all support infrastructure that are significant for the construction work:*** This would involve the transportation of machinery and deployment of the workers to the construction site. The machinery would be used for ground breaking and transportation of materials from the sources to the site. The major machineries that will be used include mixers, welding machines and transmission machines. The contractor will also mobilize human workforce at casual, permanent, skilled and unskilled levels.

b) ***Acquisition and transportation of building materials:*** The contractor shall source for materials for construction from the various available suppliers. Supply of materials will be a continuous activity throughout the project life since different materials will be needed at different phases of the construction. The materials that shall be used in the construction include among others building stones, sand, ballast, cement, timber, reinforced concrete frame, steel, bars, G.I pipes, PVC pipes, pavement blocks, concrete slabs, murram, hardcore, insulated electrical cables and timber among others.

c) ***Excavation and land filling works:*** Excavation will be carried out to prepare the site for construction of foundations to lay the residential houses and all other proposed facilities and utilities. This will involve the use of heavy earthmoving machinery such as excavators, tractors, tippers and bulldozers

d) ***Masonry, Concrete Work and Related Activities:*** The construction of the perimeter walls, building walls, foundations, floors, pavements, drainage systems among other components of the project will involve a lot of masonry work and related activities. General masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labour intensive and will be supplemented by machinery such as concrete mix

e) ***Structural Steel Works:*** The buildings will be reinforced with structural steel for stability.

Structural steel works will involve steel cutting, welding and erection.

f) ***Roofing and Sheet Metal Works:*** Roofing activities will include slab roofing

g) ***Transportation of the construction wastes from the site:*** Construction waste that cannot be used for either back filling or landscaping work at the site will be deposited in approved dumpsites by a contracted licensed waste handler.

h) ***Electrical Work:*** Electrical work during construction of the premises will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets etc. in addition, there will be other activities involving the use of electricity such as welding and metal cutting.

i) ***Power distribution:*** The position for location of power transformer to serve the proposed apartments will be determined by experts from KPLC. The project will increase power demand in the area and it is proposed that the proponent should consider other power sources like solar to reduce on the power demand. The proposals include solar power especially for water heating purposes and to supplement power supply when experiencing power outage problems.

j) ***Plumbing:*** Installation of pipe work for water supply and distribution will be carried out within the proposed residential houses and associated facilities. In addition, pipe work will be done to connect sewage from the premises to the main waste water disposal lines, and for drainage of storm water. Plumbing activities will include metal and plastic cutting, the use of adhesives, metal grinding and wall drilling among others.

k) ***Fire protection:*** Self-contained fire detection and alarm system complete with manual call points, optical smoke detectors, heat detectors and electronic sounders will be proposed especially in the kitchen areas. Hose reel fire protection system will be provided to cover the buildings. The system will comprise of a water storage tank; distribution of pipe work and fire hose reels and portable fire extinguishers will be provided at convenient spots. Additional provision will be made for special hazards and high-risk areas.

m) **Landscaping and tree planting:** To improve the environmental and aesthetic value or visual quality of the site once construction ceases, the proponent will carry out landscaping and tree planting. This will include establishment of flower gardens and lush grass lawns and will involve replenishment of the top soil. It is noteworthy that the proponent will use plant species that are available locally preferably indigenous ones for landscaping. The proponent has already established a tree nursery in preparation of the trees to be used for landscaping and tree planting.

2.5.4 Occupation/Operational stage

This stage shall involve running and managing the facility as per the laid down rules and procedures.

a) ***Residential activities:*** Once construction is complete, the units will be ready for occupation by

respective owners/tenants.

b) ***Solid waste and waste water management:*** The proponent will provide facilities for handling solid waste generated within the facility. These will include dust bins/skips for temporarily holding waste within the premises before final disposal by the contracted licensed waste handler at the designated dumping site. Sewage generated from the residential buildings will be discharged into the trunk sewer line managed by NCWSC, while the storm water drainage system will also consist of a network of Inverted Block Drains, manholes and road gullies which will discharge to the proposed artificial water reservoir.

c) ***Compound Cleaning:*** The management will be responsible for regular washing and cleaning of the paved and non-paved areas. Cleaning operations will involve the use of substantial amounts of water, disinfectants and detergents, blooms, rakes, wheelbarrows among others.

d) ***General Repairs and Maintenance:*** The residential and other facilities buildings will be repaired and maintained regularly during the operational phase of the project. Such activities will include repair of building walls and floors, repairs and maintenance of electrical gadgets and equipment, repairs of leaking water pipes, painting, maintenance of the gardens and grass lawns and replacement of worn-out materials among others.

2.6 Decommissioning Phase

Decommissioning of operations is here taken to mean that the buildings cease to operate and the premises are closed down or reverted to another use. Under such circumstance, the project proponent will be expected to adhere to the legislation applicable to such undertaking in the laws of Kenya but in general the decommissioning shall be staggered through a number of steps and measures to rehabilitate the site to its near original status before the commencement of the proposed project. This will involve looking for alternative uses for the site that is compatible to the surrounding and to the former use. An environmental impact assessment shall be commissioned to advice on the environmental aspects with respect to the identified new use if found necessary. If no other use(s) are found for the site, rehabilitation measures to revert it to its former use a state shall be implemented that include: -

i. Building stones, paving slabs, and other installations of economic use can be sold-off in the market through a biding or auction sale.
ii. Dug up areas should be backfilled with uncontaminated earth.
iii. All solid wastes including debris shall be disposed in a designated dumpsite.
iv. The site shall be re-vegetated with vegetation capable of protecting the soil from erosion

The owners will then, deregister its operations and legal requirements such as the certificates of operations will be surrendered to the relevant issuing bodies.

2.7 Project Outputs

2.7.1 Management of the Waste Generated

Different types of waste will be generated during the construction, operation and decommissioning phases of the project. The waste will be inert, hazardous and non-hazardous. The operations phase of the building will result in quite a significant volume of waste, mostly from project workers and the day-to-day operations of the facility. Maintenance and repair activities conducted during the operational lifetime of the project may generate limited volume of waste. Demolition of structures during decommissioning will result in large volumes of debris and other wastes.

2.7.2 Waste Management Strategy

Prior to the commencement of the proposed project, the Proponent will prepare a Waste Management Plan that will: State the methods for properly managing waste i.e. sorting, handling, storing, transporting and disposing wastes; Identify and describe possible locations of landfills or designated disposal sites; Propose a minimization/collection/storage/treatment/re-use/disposal route for each waste; Identify potential third party re-users; Contract a NEMA licensed waste collector; and Propose location of waste storage and duties of site personnel.

The project proponent shall comply with the sustainable waste management Act 2024 through implementation of a Waste Management Plan during the all phases of the proposed project.

2.7.3 Waste Management Standards

The standards to be used for the construction, operation and decommissioning of the terminal will be in conformance with Legal Notice 121 on Waste Management Regulations 2006. If these regulations do not cover certain aspects of the project, then the Proponent shall comply with international regulations on environmentally sound management of waste.

2.7.4 Waste Inventories and Classification

Waste inventories will be created to quantify and characterize waste streams at each stage of the project. Separate inventories will be developed for construction wastes and for commissioning/operational wastes. The volumes of waste requiring ultimate disposal will be minimized both through the control of waste generation and through land-filling. Inert and non-hazardous wastes that cannot be reused or recycled may be incinerated in a facility designed and operated in accordance with the Management Regulations 2006.

2.7.5 Hierarchy of Waste Management Practices

Each waste stream will be managed according to the following hierarchy of techniques, in which the technique chosen should be the first in the hierarchy that is safe and practicable:

- ✓ Eliminate or reduce the waste;
- ✓ Re-use as a material or fuel;
- ✓ Process and re-use as a material or as a fuel;
- ✓ Incinerate or re-use or landfill the ash;
- ✓ Landfill;
- ✓ Landscape - Landfill with appropriate vegetation planted; and
- ✓ Discharge to a receiving water course (applicable only to waste water)

2.7.6 Transfer of Waste to Third Parties

It is expected that there will be several third parties that may receive wastes generated during the construction of the proposed development. These third parties will include commercial waste disposal contractors and entities (corporate or individual) that have the capacity to reuse or recycle waste materials. In general, transfer to third parties for ultimate disposal will only be permitted if the part of their operation that is used for the proposed project waste is licensed. However, items such as timber wastes and other re-useable project wastes may be disposed to local population on the basis of case-by-case review by the proponent.

2.7.7 Waste Management

The principle objective of waste management program is to minimize the pollution of the environment as well as to utilize the waste as a resource. This goal should be achieved in a way that is environmentally and financially sustainable.

Waste water includes all water flows from the construction sites, work sites and subsidiary operations such as vehicle and equipment washing. Waste water from temporary site offices should be treated in a biodigester. Waste water from the works will generally be from curing of concrete works. This waste water is not hazardous but should be monitored to ensure it does not cause adverse effects.

The technologies for the management of the solid wastes will incorporate the collection of the waste from the source, transportation of the waste to the place of storage and final disposal through a contracted waste handler. The following waste management techniques shall be used in the different stages of the project.

a) ***During construction:*** The main wastes from the construction site will consist of material residues of the construction materials. These include pieces of concrete, heaps of sand and aggregate, bits and pieces of various pipe types, cans of paint, polythene sheets, paper packaging materials, pieces of

timber, and off cuts of metals among others. They shall be managed as follows:

- ✓ Express condition shall be put in the contract that before the contractor is issued with a completion certificate; he will clear the site of all debris and restore it to a state acceptable by the supervising architect and environmental consultant.
- ✓ Materials from excavation of the ground and foundation works shall be reused for earth works and landscaping.

b) ***During operation:*** During operation phase, residents will contract a licensed waste handler who will collect their household waste at agreed intervals and dump them at licensed waste dumping sites.

SOLIDS	**METALS**
Broken building blocks	Welding Rods
Cement (Dust)	Isolated Steel Piles Wasted Lengths
Paper and Cards	Copper (Electrical Wires etc)
Plastic bottles, cans, drums & packaging bags (both polythene and biodegradable)	Reinforcement steel
AGGREGATES	**SLUDGES**
Vehicle parts	Grease
Glass	Oil
Rags and Oil Adsorbents	Paint
Light bulbs and tubes	**LIQUIDS**
Paint cans and brushes	Wash down water and drum water
Stone and Rocks	Oily water
Tyres	**DOMESTIC**
Waste Timber	Food
Cleared undergrowth, shrubs etc	
Concrete Shuttering	
Demolition wastes	

2.7.8 Atmospheric Emissions Operations

Atmospheric emissions will be generated by diesel-powered generators and company vehicles during construction and operation phases. It is anticipated that the most significant components of such emissions will be combustion gases, specifically:

- ✓ Nitrogen Oxides (NOx);
- ✓ Carbon monoxide (CO);
- ✓ Sulphur Dioxide (SO2);
- ✓ Particulate matter (PM);
- ✓ Suspended Particulate matter (SPM);
- ✓ Volatile Organic Compounds; and
- ✓ Secondary pollutants

Emission of pollutants by vehicles contributes to global warming ultimately climate change. The emissions will vary from time to time depending on the traffic volume and traffic composition.

Relative air emission is expected during construction when dust from construction activities and smoke from construction machinery will be emitted. It is recommended that watering the site especially during dry periods be enforced to keep dust at minimal levels. The employees at the site especially during construction activities shall be provided with dust masks to protect them from dust and fumes associated with construction activities.

2.8 Energy

Construction machineries will require fuels (diesel) during construction phase. Electrical power will come in handy; in driving the selected construction machinery. Energy will also be needed during occupation phase (upon completion of the project). The general area and the proposed site in specific is supplied with electricity from the national grid. In addition to the above, the need for energy conservation will be emphasized during construction and occupation phases. During occupation phase, the use of energy conserving appliances (i.e., energy saving bulbs) and renewable energy sources such as solar energy will be encouraged.

2.9 Communication

The area is well covered by communication facilities such a Telkom, Airtel and Safaricom among others. All these will facilitate communication during the project cycle.

CHAPTER THREE: BASELINE INFORMATION FOR THE STUDY AREA

3.1 Introduction

This chapter has information on the location, bio- physical, socio and economic aspects of the project area. These are elaborately discussed in order to identify areas likely to be affected as a result of project activities. This study therefore considered the physical location, climatic data, geology, drainage, infrastructure, demography and socio-economic information.

3.2 Nairobi city county

Nairobi is the capital and largest city of Kenya. The city and its surrounding area constitute the Nairobi City County, earmarked as the 47th County in Kenya. Nairobi was founded in 1899 by colonial authorities in British East Africa, as a rail depot on the Uganda - Kenya Railway. The town quickly grew to replace Mombasa as the capital of Kenya in 1907. After independence in 1963, Nairobi became the capital of the Republic of Kenya. In its young age, the growth of Nairobi was propelled by its central position between Mombasa and Kampala, and being preferred as an ideal residential zone due to its network of rivers and favourable weather.

The strategic location still plays a significant role currently, rendering Nairobi City County an attractive destination for trade, tourism, education, residence and other social activities. Its attractive physical, social and economic features provide promising opportunities for socio-economic development for all.

As the capital city, Nairobi is the main administrative center for Kenya, hosting; both the National government executive and the national assembly and the senate, The County Government including the County Assembly, Diplomatic missions; International and multinational institutions; and other local, regional and intercontinental dignitaries in different areas of operation.

Nairobi is a transport and communication hub and hosts Jomo Kenyatta International Airport (JKIA) which is the biggest Airport in East and Central Africa, and is the focal point for major aviation activity in the region. Its importance as an aviation center makes it the pacesetter for other airports in the region. Majority of road transport nationally also commence and conclude their trips in the city. Recent major developments in ICT have also positioned Nairobi as a major communication center, characterized by strong and fast internet connectivity, fast spread of fiber optic cabling and high adoption of upcoming technologies.

Nairobi National Park in the vicinity of the city gives an opportunity to view wildlife in their natural ambience, and is a destination for both local and international tourism. Tourism in the county is

accentuated by the thriving hospitality industry, with a high concentration of the best and highly rated hotels.

As a financial and commercial hub, Nairobi hosts the highest concentration of financial institutions including Commercial banks, micro-finance institutions and Forex Bureaus. These endowments make the city a major commercial hub on the African continent. It's the home of major industries accounting for about 80 per cent of the total industries in the country and they offer a wide range of employment opportunities for the people within and outside the county.

3.3 Position and Size

Nairobi County is one of the 47 Counties in the Republic of Kenya. It borders Kiambu County to the North and West, Kajiado to the South and Machakos to the East. Among the three neighbouring counties, Kiambu County shares the longest boundary with Nairobi County. The County has a total area of 696.1 Km2 and is located between longitudes 36°45' East and latitudes 1° 18' South. It lies at an altitude of 1,798 metres above sea level. Nairobi is situated at in South-Central Kenya, 140 Kilometers (87 miles) south of the Equator. It is adjacent to the eastern edge of the Rift Valley, and to the west of the city, are The Ngong Hills. Mount Kenya is situated north of Nairobi, and Mount Kilimanjaro is towards the south-east.

The proposed site falls within Plot No. 1870/85 (Nairobi/Block 7/57) along Ring Road Parklands in Parklands/Highridge area

3.4 Physiographic and Natural Conditions

3.4.1 Physical and Topographic Features

The terrain in the eastern side of the County is gently rolling but divided by steep valleys towards the City boundaries. To the north, there is the Karura Forest which is characterized by steep sided valleys. The Karen-Langata area is characterized by plains surrounded by Nairobi National Park on the east and Ngong Forest on the south. Geologically, Nairobi City County is close to the Eastern border of the East African Rift Valley and is on a large depression filled with volcanic rocks and sediments Cainozoic times, which lie on basement complex rocks. The volcanic rocks (phonolites) have gentle slopes flowing eastwards from the rift Valley (Kahara,2002). The volcano clastic rocks of Pliocene age have a bearing on the area's hydrology and the groundwater.

Major aquifers in the area are usually beneath the confining and deeply seated Upper Athi series. The Upper Athi series comprises of a heterogeneous combination of lake-bed, reworked sediments, air-fall tuffs, ashes and occasional intercalated lava flows (UNDP, 2007). The main rivers in the County are Nairobi River, Ngong River and Kabuthi River. They transverse through the Nairobi County and joins

the larger River Athi on the eastern edge. These rivers are highly polluted by effluence from open sewers and industrial waste. Nairobi dam, which is along the Ngong River, and Jamhuri Dam are the main water reservoirs in the County. The main types of soils are black cotton and red soils that form patches in different parts of the County. There are three forests in the County, namely Ngong Forest to the south, Karura Forest to the north and the Nairobi Arboretum. The three forests have a total coverage of 23.19 Km2.

3.4.2 Climatic Conditions

Nairobi is situated close to the equator hence the differences between the seasons are minimal and the timing of sunrise and sunset varies little throughout the year. Under the Köppen climate classification, Nairobi has a subtropical highland climate (Cwb). At 1,795 metres (5,889 ft) above sea level, evenings may be cool, especially in the June/July season, when the temperature can drop to 9 °C (48 °F). The sunniest and warmest part of the year is from December to March, when temperatures average in the mid-twenties Celsius during the day. The mean maximum temperature for this period is 24 °C (75 °F).

Actual temperature ranges from a low of 10 degrees to a high of 29 degrees Centigrade.

Due to the ITCZ (Inter- Tropical Convergence Zone) that forms throughout the area around the equinoxes, where the prevalent winds of the Northeast and Southeast converge, Nairobi has a bimodal rainfall pattern with the long rains season falling between March to June while the short rains season falls between October and December. The mean annual rainfall is 900 mm ranging from 500mm to 1500mm. During the long rains, the storm water mostly disappears as run off due to the poorly drained cotton soil and the paved land resulting in flooding.

3.4.3 Ecological Conditions

The County is predominantly a terrestrial habitat that supports a diverse web of biodiversity and ecosystems. It is home to about 100 species of mammals, 527 bird species and a variety of plant species. The existence of Nairobi National Park has been of prestigious value as the only park within a city. The Park is covered by a highland of forest hardwoods. Variety of birds and animals find their home in the Park including the Big Five.

To the North west of the city, adjacent to the Rift Valley is an area of undulating grassland with a covering of rich well- drained "red- coffee soils". To the North- East of the city, the high and ever sloping land is dissected by South- East flowing streams which have formed a series of steep sided parallel ridges and valleys. South and East of Nairobi are grassland plains of poorly drained "black cotton clays". Due to high population growth and urbanization rates, environmental degradation has been experienced in Nairobi, causing stress on the natural resources. The main surface water sources are Ngong and Nairobi Rivers,

clean when they enter the city but highly polluted as they leave. All rivers in Nairobi have been excavated in search of sand for construction.

3.4.4Population Size, Composition and Distribution

Nairobi County's population was 4,397,073 people as per the 2019 Kenya Population and Housing Census 2019 with 2,192,452 (49.9%) being male, 2,204,376 (50.1%) being female and 245 (0.006%) being intersex. The county had 1,506,888 households and an average household size of 2.9.

3.5 Land use:

Urban land use refers to spatial distribution of social and economic activities. Accordingly, an up-to-date land use inventory is frequently required to facilitate urban planning and growth patterns as well as monitoring of urban expansion. A study by the Department of Resource Surveys and Remote Sensing (DRSRS 1994) identified eight major land-use classes in major urban centres in Kenya. These include Residential use Industrial, commercial and service centres, Infrastructure land use, Recreational areas, urban agriculture as well as Water bodies and riverine areas.

Parklands, located in Westlands Sub- County of Nairobi City County, has experienced significant land use changes over the past few decades. Originally planned as a low-density residential suburb during the colonial period, Parklands has experienced;

- ✓ Conversion of single-family homes to high-rise apartments and flats.
- ✓ Emergence of mixed-use developments combining residential, commercial, and institutional uses.
- ✓ Proliferation of commercial buildings, hospitals, educational institutions, and religious centers, especially along major roads.

3.6 Socio-Economic Profile

Development of the proposed residential apartments project will be influenced by two important socio-economic aspects, i.e. population/demography and economic trends in the neighbourhood and the Nairobi City County at large.

3.6.1 Population Demography

The Nairobi, Kiambu and Machakos Counties are among the key county areas in the Nairobi Metropolitan region that have continued to experience high rates of demographic transition over time. This is mainly due to the urban rural migration as well as natural population increase. The increased population in these areas has led to increased housing demand.

3.6.2 Housing Demand in Nairobi City County

In 2019, the demand for Middle Income Housing in Nairobi was estimated to reach 18,000 units. As of 2025, Nairobi City County is experiencing a significant housing demand, driven by rapid urbanization and population growth with an approximate demand of 260,000 new housing units annually.

3.6.3 Employment Trends in the Area

Parklands area has transformed into a prominent mixed-use zone, attracting numerous businesses, institutions and housing units. The influx of corporations, medical institutions, and government agencies into Parklands has significantly boosted employment opportunities. Notable establishments include; health professionals, real estate sales agents and sales/marketers, education professionals among others.

3.6.4 Trunk Infrastructure, Utilities and Community Social Services

a) Transport Network

Parklands area has fairly robust **road transport system**, supporting high volumes of private vehicles, public transport, and commercial traffic. The key roads include; Limuru road, Ojijo road, Ring Road Parklands,1st to 5th Parklands avenues and City Park Drive. The subject roads links Parklands area to CBD, Westlands, Gigiri, and Pangani.

The proposed site is served by Ring Road Parklands.

CHAPTER FOUR: POLICY, LEGAL AND LEGISLATIVE FRAMEWORK

4.1 Introduction

Environmental Impact Assessment is an instrument for environmental management and development control. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound. It is a condition of the Kenya Government for developers to conduct Environmental Impact Assessment (EIA) on the development Projects. According to Sections 58 and 138 of the Environmental Management and Coordination Act (EMCA) No. 8 of 1999 (vide legal notice 31 of 2019) and Section 3 of the Environmental (Impact Assessment and Audit) Regulations, 2003 construction of urban residential development with more than one hundred units require an Environmental Impact Assessment study project report prepared and submitted to the National Environment Management Authority (NEMA) for review and eventual licensing before the development commences. This was necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

4.2 Legal and legislative Framework

Environmental policies cut across all sectors and government departments. As such policy formulation should be consultative steered by interdisciplinary committees.

4.2.1 The Constitution of Kenya, 2010

The Constitution of Kenya (2010) takes supremacy over all aspects of life and activity in the Republic. With regard to environment, article 42 of the CoK (2010) states as thus:

> Every person has a right to a clean and health environment which includes the right:
>
> (a) to have the environment protected for the benefit of present and future generations through legislative and other measures particularly those contemplated in article 69 and
>
> (b) to have the obligations relating to the environment fulfilled under article 70 of CoK (2010)

Thus, the implementation of the proposed development project is guided by this provision of the CoK (2010). Implementers will be expected to undertake their work with the understanding that persons are entitled to clean and health environment which must not be taken for granted.

The provisions of article 69 and article 70 of the CoK (2010) are enumerated hereunder

Article 69

Article 69**,** subsection (1): The State shall— (a) ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits; (b) work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya; (c) protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities; (d) encourage public participation in the management, protection and conservation of the environment; (e) protect genetic resources and biological diversity; (f) establish systems of environmental impact assessment, environmental audit and monitoring of the environment; (g) eliminate processes and activities that are likely to endanger the environment; and (h) utilize the environment and natural resources for the benefit of the people of Kenya

By this article, public participation is encouraged and non-compliance is a violation of the constitution. Trees are protected by this section and the policy to be applied is thus:

All mature indigenous trees should be not be cut. But when the best route for project implementation must affect the tree, then the project implementers must considers trimming the branches as the best option before considering cutting it. To cut mature trees especially indigenous trees should be the last option.

Subsection (2) "Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources". This obligation will be laid upon every stakeholder in the implementation process in order to maintain harmony in the development process. Key stakeholders targeted by this include the proponent, contractor and the host community. The following state organs may seek to inspect contractor' premises and should be allowed access; (i) NEMA (ii) DOSH (iii) Public health (iv) The county ministry in charge of LIHUD.

Article 70

This section provides for enforcement of environmental rights thus: (1) If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter. (2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate:

(a) to prevent, stop or discontinue any act or omission that is harmful to the environment; (b) to compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or (c) to provide compensation for any victim of a violation of the right to a clean and healthy environment. (3) For the purposes of this Article, an applicant does not have to demonstrate that

any person has incurred loss or suffered injury. This means that the project players must be cognizant of the fact that the public has been empowered by this article and can "interrupt" work progress through the court process and therefore implementers should respect the environmental regulations especially to ensure the community right to a clean and health environment is honoured.

The provisions for a clean and healthy environment notwithstanding, the ARTICLE 41 (1) on labour relations states thus: Every person has the right to fair labour practices WHICH include the right to fair remuneration and the right to reasonable working conditions. The contractor will be bound by this requirement to ensure that his workers remuneration is within the minimum wage provisions and that the working conditions (which include the equipment and sanitation) are reasonable. Each worker should be provided with Personal Protective Equipment during working hours. The contractor will develop a safety management policy and enforce it.

All Kenyan policies, regulations, and legislations relevant to sustainable development are anchored in the CoK (2010) and some are discussed below.

The proposed project activities will ensure that the ecological processes and the environment are not severely damaged through proper implementation of the proposed mitigation measures put in place to ensure that the project construction and operation activities do not adversely affect the surrounding environment.

4.2.3 Sessional Paper Number 10 of 2012 (Vision 2030)

This is the National Blueprint for economic advancement of Kenya. It is also called as the Vision 2030 and it is the long-term development strategy for Kenya towards achieving a "globally competitive and prosperous country [economy] with a high quality of life by 2030. The key objective of the Vision 2030 is to transform Kenya into a new industrializing middle income country by the year 2030 AD. It envisions a high quality of life for the majority of Kenya citizens in a clean and health environment as contemplated in the Sustainable Development Goals [SDGs]. Vision 2030 is anchored on 3 pillars:

Three pillars of Kenya' Vision 2030

Pillar	Description
Economic	To achieve a sustained annual economic growth rate of 10% to 2030
Social	To create a just, cohesive and equitable social development
Political	To build an issue, people centered democratic system that is result oriented and accountable to the public

Adopted from Vision 2030

Vision 2030 anticipates a Kenyan nation characterized by a clean, secure and sustainable environment by 2030 and sets the goals towards that:

(i) to increase forest cover from less than 3% at present to 4% and

(ii) to lessen by half all environment-related diseases.

It recommends specific strategies to promote environmental conservation in order to provide better support to the economic pillar flagship projects and for the purposes of achieving the SDGs. The implementation of the proposed project should not create room for breeding of mosquitoes which spread malaria plasmodium; neither should it lead to contamination of water [which increases incidence of water borne diseases]. The implementers must be careful on maintaining air quality [avoid air pollution] and enforce sound policies on waste management.

The proposed development project will promote the economic growth of the locality and help propel Kenya to a middle-income country as envisioned in the Vision 2030 development plan by developing the housing sector, one of the key target sectors in the plan.

4.3 National Policies

4.3.1 The National Environment Policy, 2013

The National Environment Policy aims to provide a holistic framework to guide environmental and natural resource management in Kenya. It also ensures that the link between the environment and poverty reduction is integrated into all government processes and institutions in order to facilitate and realize sustainable development at all levels in the context of a green economy, enhancing social inclusion, improving human welfare, creating employment opportunities and maintaining a healthy functioning of the ecosystem.

This policy presents the framework to deal with the ever-growing environmental issues and management challenges in Kenya like harmonizing of sectoral policy instruments with the Environmental Management and Coordination Act and the Constitution, implementing the Land Policy, valuing of environmental and natural resources, rehabilitating and restoring environmentally degraded areas, loss of biodiversity, concessions and incentives, urbanization and waste management, pollution, energy, climate change and disaster management, conservation of shared natural resources, invasive and alien species, public participation, environmental education and awareness, data and information, poverty, weak enforcement, and fragmentation.

4.3.2 National Policy on Water Resources Management and Development (Sessional Paper No.1 of 1999)

- The four specific objectives guiding in the management of water resources in Kenya include; Preserve, conserve and protect available water resources and allocate it in a sustainable, rational and economic way;
- Supply water of good quality in sufficient quantities to meet the various water needs, including poverty alleviation, while ensuring the safe disposal of wastewater and environmental protection;
- Establish an efficient and effective institutional framework to achieve a systematic development and management of the water sector; and
- Develop a sound and sustainable financing system for effective water resources management, water supply and sanitation development.

4.3.3 Policy on Environment and Development

This is presented as the Sessional paper No. 6 of 1999 on Environment and Development. The overall goal is to integrate environmental concerns into the national planning and management process and provide guidelines for environmentally sustainable development. It portrays portable water and water for sanitation as being central to satisfying basic human needs. Water resources have an extremely high value, and effective mechanisms for managing and conserving water could result into economic benefits as well as sustainable use of this vital resource. Its key objectives are protecting water catchments; ensuring that all development policies, programmes and projects take environmental considerations into account; and enhancing, reviewing regularly, harmonizing, implementing and enforcing laws for the management, sustainable utilization and conservation of natural resources.

The policy recommends the need for enhanced re-use/recycling of residues including water and wastewater as well as increased public awareness raising and appreciation of clean environment. It also enhances participation of stakeholders in the management of natural resources within their respective localities.

The project proponent is encouraged to practise waste water recycling and re-use of the waste materials.

4.3.4 The Land Policy (Sessional Paper No. 3 of 2009)

The overall objective of the National Land Policy is to secure land rights and provide for sustainable growth, investment and the reduction of poverty in line with the Government's overall development objectives. Specifically, it seeks to develop a framework of policies and laws designed to ensure the maintenance of a system of land administration and management that will provide all citizens with the opportunity to access and beneficially occupy and use land; economically, socially, equitably, and

environmentally sustainable allocation and use of land; effective and economical operation of the land market; efficient use of land and land-based resources; and efficient and transparent land dispute resolution mechanisms. The previously existing land laws have been repealed and the law consolidated into three statutes, namely the Land Act 2012, the Land Registration Act 2012 and the National Land Commission Act 2012.

4.3.5 The Kenya Environmental Sanitation and Hygiene Policy (KESHP) 2016–2030

This ia a comprehensive national framework designed to ensure universal access to improved sanitation and a clean, healthy environment by 2030. It builds upon the 2007 policy, aligning with Kenya's Vision 2030, the Constitution of Kenya 2010, and the Sustainable Development Goals (SDGs).

Its broad goal envisions *"a clean, healthy, and economically prosperous Kenya free from sanitation and hygiene-related diseases.*

Its primary objectives include:

i. Achieving **100% access to improved sanitation** by 2030.

ii. Ensuring safe and sustainable waste management in both rural and urban areas.

iii. Reducing the prevalence of sanitation-related diseases.

iv. Promoting hygiene education and behavior change across all sectors

4.3.6 The Climate Change Act 2016

The objective of the Climate Change Act 2016 is to provide a regulatory framework for an enhanced response to climate change, and to provide mechanisms and measures to improve resilience to climate change and promote low carbon development. The Climate Change Act adopts a mainstreaming approach, provides a legal basis for climate change activities through the National Climate Change Action Plan, and establishes the National Climate Change Council and the Climate Fund.

With this enactment, Kenya joins the league of nations that have taken concrete steps to domesticate the Paris Accord on Climate Change.

The main objective of the Climate Change Act is to be applied in the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low-carbon development for the sustainable development of Kenya.

4.3.7 The Energy Act 2019

The Energy Act 2019 has a very broad scope, covering all forms of energy, from fossil fuels to renewables. The Energy Act mandates the government to promote the development and use of renewable energy, including biodiesel, bioethanol, biomass, solar, wind and hydropower. The Energy Act provides a useful supporting framework for the transition to a green economy with likely gains in environmental protection and climate change.

The proposed development shall comply through installation of renewable energy sources such as solar panels

4.4 National Regulatory Frameworks

4.4.1 The Environmental Management and Co-ordination Act CAP 387

Environmental legislation in Kenya is provided in over 77 statutes. In order to provide a structured approach to environmental management in Kenya, the EMCA Act was enacted on January 14th 2000 as a framework law and contains provisions for the ESM of the proposed and ongoing Projects respectively in Kenya. With the coming into force of the EMCA, the environmental provisions within the sectoral laws were not superseded; instead, the environmental provisions within those laws were reinforced to better manage Kenya's ailing environment.

Section 58.(1) Of the Act states "Notwithstanding any approval, permit or license granted under this Act or any other law in force in Kenya, any person, being a proponent of a project, shall, before financing, commencing, proceeding with, carrying out, executing or conducting or causing to be financed, commenced, proceeded with, carried out, executed or conducted by another person any undertaking specified in the Second Schedule to this Act, submit a project report to the Authority, in the prescribed form, giving the prescribed information and which shall be accompanied by the prescribed fee". Environmental Management and Coordination Act CAP 387 provide a legal and institutional framework for the management of the environmental related matters. This EIA study has been conducted and the final report compiled pursuant to section 58 (1) of the EMCA Act and its respective stipulations.

4.4.2 EMCA Related Regulations

4.4.2.1 Environmental (Impact Assessment and Audit) Regulations, 2003

The Environmental Impact Assessment and Audit Regulations, 2003 are subsidiary regulations of EMCA, 1999 and stipulate the steps to be followed in undertaking an EIA study. The Regulations highlight the stages to be followed, information to be made available, role of every stakeholder and rules to be observed during the EIA process.

This EIA study has been conducted as per the provisions and guidelines of the Environmental Impact Assessment and Audit Regulations, 2003; has been planned, designed, compiled and implemented based on the very regulations. It shall also be maintained and guided by the same regulations and an environmental audit study will be done periodically to monitor compliance with the set environmental standards.

4.4.2.2 Environmental Management and Co-ordination (Water Quality) Regulations, 2024 Legal Notice 177/2024

The Environmental Management and Coordination (Water Quality) Regulations, 2024 (Legal Notice No. 177 of 2024) were enacted by the Government of Kenya to enhance the protection, conservation, and sustainable use of water resources. These regulations supersede the 2006 version and are part of broader environmental reforms under the Environmental Management and Coordination Act (EMCA).

These regulations apply to various water uses, such as drinking water, industrial processes, agricultural activities, recreational purposes, fisheries and wildlife habitats and any other designated uses.

The key provisions of this act are:

i. Prevention of Water Pollution
ii. Standards for Domestic Water Sources
iii. Protection of Water Bodies
iv. Establishment of Buffer Zones
v. Effluent Discharge Licensing

The proponent shall follow the necessary precautionary measures not to pollute underground water or surface water. Further, the proponent will be required to immediately notify the authority any occurrence of pollution incidence at the site. Use of oils on site will be carefully done to control spills on the surface. Servicing of machines/trucks will be carried out at designated service bay.

4.4.2.3 Environmental Management and Co-ordination (Waste Management) Regulations, 2024 Legal Notice 178/2024

The Government of Kenya (through the Cabinet Secretary - Ministry of Environment, Forestry and Climate Change) vide Kenya Gazette Supplement No. 197 (Legislative Supplement No. 86) and Legal Notice No. 178 dated 4th November, 2024; promulgated the Environmental Management and Co-ordination (Waste Management) Regulations, 2024. The Waste Management Regulations, 2024 replaces the Waste Management Regulations, 2006 (which have been in effect for the past eighteen years).

The highlights of the new Regulations include:

I. Specific non-hazardous wastes exempted from transport licensing requirements.

II. Introduction of a National Colour Coding System for waste.

III. Introduction of a National Waste Information System.

IV. Revised waste licensing fees.

V. Suspension of waste licenses for non-compliance with set license conditions.

The proponent shall ensure that the garbage handler contracted has a valid license from the National Environment Management Authority (NEMA). So as to comply with this, the contractor shall take precaution not to dump wastes in areas not registered and designated as dumpsites, and all waste disposed of as per the Waste management regulations.

4.4.2.4 EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009

In May 2009, the Minister for Environment and Mineral Resources promulgated the above regulations for management of noise and excessive vibration. The general prohibition states that no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. The regulations further provide factors that will be considered in determining whether or not noise and vibration is loud, unreasonable, unnecessary or unusual.

For fixed installations, excessive vibration under these regulations is defined as any vibration emanating from the source and exceeds 0.5cm/s. Rules 5 and 6 of the regulations define noise levels for various types of activities that generate noise. The first schedule to the regulations defines permissible noise levels measured 30m from the boundary fence of a project. A noise license will be required during the construction phase of the project and a noise survey conducted once operation is recommended for presentation to the authority.

The proponent shall implement these measures, ensure that all noise equipment, tools, vehicles, are in good working condition to reduce noise. The project contractor will be required to avoid carrying out noise emitting activities and work within the stipulated time periods. in addition, regular noise monitoring will be conducted and acquisition of noise permit in extreme cases

4.4.2.5 Environmental Management and Coordination (Air Quality) Regulations, 2024 Legal Notice No. 180 of 2024

This is an improvement of the 2014 Regulations and introduces various improvements including emission testing from mobile sources. The Environmental Management and Co-ordination (Air Quality) Regulations, 2024-enacted under Legal Notice No. 180 of 2024-aim to enhance Kenya's air quality management framework introducing stricter controls and updated standards to prevent, control, and abate air pollution, thereby ensuring clean and healthy ambient air.

The key provisions are:

- ✓ Prohibition of Air Pollution
- ✓ Priority Air Pollutants
- ✓ Emission Licensing
- ✓ Monitoring and Reporting
- ✓ Stack Emission Standards
- ✓ Controlled Areas

The proponent shall implement the mitigation measures provided in the EMP to prevent air pollution during construction and operation phases. Further, the proponent will also conduct regular air quality monitoring.

4.4.2.6 The Sustainable Waste Management (Extended Producer Responsibility (EPR) Regulations, 2024. Legal notice 176/2024

The Government of Kenya, through the Cabinet Secretary (Ministry of Environment, Climate Change and Forestry) gazetted the Sustainable Waste Management (Extended Producer Responsibility (EPR)) Regulations 2024 on 4th November 2024. These regulations aim to promote environmentally sound management of products throughout their life cycle, to obligate producers to take responsibility for the end-of-life (postconsumer) management of their products and to operationalize polluter pay principle. Key highlights on the EPR Regulations include:

1. The regulations apply to all producers (manufacturers, importers and brand owners) of products listed in the first schedule of these regulations and the Extended Producer Responsibility (EPR) schemes for the products category in the first schedule.

2. These regulations highlights the Extended Producer Responsibility (EPR) obligations that each producer shall execute as per (regulation 5).

3. All importers of products listed in the first schedule shall within six months from the gazettement date (4th November 2024) register with NEMA and pay fees as per the first schedule.

4. All producers (brand owners) of products listed in the first schedule shall within six (6) months apply to NEMA for registration and issuance of extended Producer responsibility Certificate.

5. Requirements for registration of Producers, Importers and Extended Producer Responsibility (EPR) Schemes.

6. Requirements for licensing of the Extended Producer Responsibility schemes for the products category.

7. Requirements for Registration and licensing fees.

The proponent shall ensure full compliance with the Extended Producer Responsibility (EPR) regulations

4.4.2.7 Environmental Management and Co-ordination (Management and control packaging of plastic materials) Regulations, 2024, Legal Notice 181/2024

The Government of Kenya (through the Cabinet Secretary - Ministry of Environment, Forestry and Climate Change) vide Kenya Gazette Supplement No. 197 (Legislative Supplement No. 87) and Legal Notice No. 181 dated 4th November, 2024; promulgated the Environmental Management and Co-ordination (Management and Control of Plastic Packaging Materials) Regulations 2024 was Gazetted on 4th November 2024. Key highlights of the new Regulations include

1. The Regulations apply to All plastic Carrier bags, Flat bags and Plastic film and all plastic packaging materials on imported products

2. All manufacturers, importers, sellers or users in possession of plastic packing Materials shall, within one month of the commencement of these Regulations declare their stock of plastic packaging materials to the Authority

3. Every importer of plastic packaging materials shall declare at the port of entry in Kenya the quantities and purpose of the plastic packaging materials

4. Requirement of an Extended Producer Responsibility (EPR) Plan

5. Requirements for license processing and monitoring fees

6. Due diligence assessment report of any entity contracted to; implement EPR plan or manage a recycling collection center or collect, process and transport plastic bags, plastic film and product wrap or recycle plastic packaging material

4.5 Other Environment, health and safety, physical planning related laws

4.5.1 Water Act, 2002

Water in Kenya is owned by the Government, subject to any right of the user, legally acquired. However; this Act regulates conservation and management of all water resources within the republic, and related purposes.

In section 3 of part II, it states that every water resource is vested in the State, subject to any rights of user granted by or under this Act or any other written law. The Act also provides for establishment of a Water Resource Management Authority, whose aim is to manage and coordinate conservation and utilization of water resources at national scale. The Act will thus play a central role in guiding the exploitation and conservation of the limiting and scarce water resource throughout the project life.

4.5 2 The Penal Code CAP 63

Chapter XVII on "Nuisances and offences against health and convenience" contained in the penal code strictly prohibits the release of foul air into the environment which affects the health of the persons. It states "Any person who voluntarily vitiates the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighbourhood or passing along a public way is guilty of a misdemeanor".

Waste disposal and other project related activities shall be carried out in such a manner as to conform to the provisions of the code.

4.5.3 Occupational Health and Safety Act No.15 of 2007 and the 2007 Subsidiary legislation (Cap 514)

This Act of Parliament was enacted to provide for the health, safety and welfare of persons employed in workplaces and for matters incidental thereto and connected therewith.

Its relevant clauses and stipulations relevant to the proposed project are;

i. Part II of the Act provides the General Duties that Occupiers must comply with in respect to health and safety in the workplace. Such duties include undertaking S&H risk assessments, S&H audits, notification of accidents, injuries and dangerous occurrences, etc.

ii. Part III of the Act provides the Administrative framework for supervision of the Act.

iii. Part IV deals with the enforcement provisions that the DOSHS has been provided with under the Act. It discusses the instances when Improvement and Prohibition Notices can be issued as well as the powers of OSH officers.

iv. Part V of the Act requires all workplaces to be registered with the DOSHS. The Occupier has to apply for registration of their project with the DOSHS on completion of installation of the crusher and before the operational phase of the project.

v. Part XI of the Act contains Special Provisions on the management of health, safety and welfare. These include work permit systems, PPE requirements and medical surveillance. All sections of this part of the Act will be applicable to this project during the operational phase.

vi. Part XIII of the Act stipulates the fines and penalties associated with non-compliance of the Act. It includes those fines and penalties that are not included in other sections of the Act and will be important for an Occupier to read and understand the penalties for non-compliance with S&H provisions.

vii. Part XIV of the Act is the last section of the Act and contains miscellaneous provisions which are not covered elsewhere. Most of the sub-sections under this part of the Act will be applicable to mining projects and it is in the interest of an Occupier to read, understand and ensure compliance with it.

Some of the important subsidiary legislations which operationalized the Act and are applicable to the proposed project are described below.

i) ***(Safety and Health Committee) Rules 2004***

These rules came into effect on April 28th, 2004 and require that an Occupier formalize a Safety and Health (S&H) Committee if there are a minimum of 20 persons employed in the work place. The size of the S&H Committee depends on the number of workers employed at the place of work. For a Proponent and Contractor, the Occupational Safety and Health Act and the S&H Committee Rules 2004 are important as they require compliance with the following measures:

i. Posting of an Abstract of the Factories and Other Places of Work Act in key sections of each area of the workplace;

ii. Provision of first aid boxes in accordance with Legal Notice No. 160: First Aid Rules of 1977;

iii. Ensuring that there are an appropriate number of certified first aiders trained by a DOSHS approved institution and that the certification of these first aiders is current;

iv. Provision of a General Register for recording amongst other things all incidents, accidents and occupational injuries;

v. Appointment of a S&H Committee made up of an equal number of members from management and workers based on the total number of employees in the company;

vi. Training of the S&H Committee in accordance with these rules;

vii. Appointment of a S&H management representative by the Proponent;

The Safety & Health Committee must meet at least quarterly, take minutes, circulate key action items on bulletin boards and may be required to send a copy of the minutes to the DOSHS local office. Proper record keeping including maintenance of all current certificates related to inspection of critical equipment such as the tractor, transport vehicles and the generator, etc. Such inspections need to be undertaken by a competent person certified by the Director of the DOSHS.

ii) **(Noise Prevention and Control) Rules**

These rules have set minimum and maximum exposure limits beyond which workers and members of the public should not be exposed to noise without adequate means of protection. The rules also have limits for exposure out of workplaces. The rules have several recommendations on a comprehensive noise control program for workplaces that includes a requirement for medical examination of workers who are exposed to noise. The rules have also set the minimum noise levels that should emanate from a facility to public/neighbouring areas by day or by night. The proponent will provide functional earmuffs for those operating the noise emitting machines and those working in noisy environments; and keep on renewing their noise and vibration permit from NEMA. All in all, the project proponent will be required to adhere to all the stipulations of the OSHA Act, 2007 requirements and regulations.

iii) **Medical Examination Rules, 2005**

These rules provide for Occupiers to mandatorily undertake pre-employment, periodic and termination medical evaluations of workers whose occupations are stipulated in the Second Schedule of the Act and the First Schedule of the Regulation. The workers are to undergo medical evaluations by a Designated Health Practitioner (DHP) duly registered by the DOSHS. Exposure to airborne crystalline silica present negative impacts to human health, the workers exposed to the dust will be required to undergo medical examinations in accordance with the above Rules. The project proponent is required to ensure that on site

workers are examined medically and appropriate gears availed to them while at site, like earmuffs, helmets, overalls and respiratory gears.

iv) **Fire Risk Reduction Rules, 2007**

These rules were promulgated by the Minister for Labour on April 16th 2007 and apply to all workplaces. The rules apply to this sector project in several ways as enumerated below;

Rule 16 requires a Proponent to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected after six months by a competent person and the Proponent is required to keep records of such inspections.

Rules 29 – 31 refer to the installation and maintenance of fire-fighting systems in workplaces. Fire extinguishers are to be mounted at least 60cm above ground while a fire hose reel must be located within a radius of 30m. Fires can arise from electrical fault at the site.

Worker's safety will be given priority during both construction and operation phases of the project. The proponent shall adhere to the provisions of OSHA, 2007 and the subsidiary rules and regulations under it.

4.5.3 The Work Injury Benefits Act (WIBA), 2007

The WIBA Act provides for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes;

Section 7(a) of the Act, on the obligations of the employer, requires an employer to obtain and maintain an insurance policy with an insurer approved by the State in respect of any liability that the employer may incur under this Act to any of his employees.

Section 10(1) States that an employee who is involved in an accident resulting in the employee's disablement or death is subject to the provisions of this Act, and entitled to the benefits provided for under this Act. It also states expressly that an employer is liable to pay compensation in accordance with the provisions of this Act to an employee injured while at work.

On First Aid covered in section 45(1), an employer is supposed to provide and maintain such appliances and services for the rendering of first aid to his employees in case of any accident as may be prescribed in any other written law in respect of the trade or business in which the employer is engaged.

The proponent shall acquire insurance cover for all the workers for the time they will be working at the project site which will enable them get compensation in case of accident occurrence.

4.5.4 The Public Health Act CAP 242

Part IX, section 115 of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires local authorities to take all lawful, necessary, reasonable and practicable measures to maintain areas under their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable for injurious or dangerous to human health.

During the project works, construction and operation, the management will comply with the provisions of this Act in terms of constructing storm drains and sanitary facilities to the required standards and ensuring that the site is safe from nuisance or pollution of any nature.

4.5.5 The Land and Environment Court

The Land and Environment Court is established under the Environment and Land Court Act, 2011 (No. 19 of 2011). It is empowered by law, given the status of the High Court and has the jurisdiction to hear and determine disputes, actions and proceedings concerning acquisition of land as well as matters pertaining to the environment.

4.5.6 The County Government Act 2012

Section 163 allows counties to control or prohibit all businesses, factories and workshops which, by reason of smoke, fumes, chemicals, gases, dust, smell, noise, vibration or other cause, may be or become a source of danger, discomfort or annoyance to the neighbourhood, and to prescribe the conditions subject to which such businesses, factories and workshops shall be carried on. The same section allows counties to prohibit, control and regulate trade and trading activities within their jurisdiction.

4.5.7 The Physical Planning Act of 1996 CAP 286

The Act allows for prohibition or control over the use and development of land and building in the interest of proper and orderly development of an area. Section 30 states that any person who carries out development without permission will be required to restore the land to its original condition. It also states that no other licensing authority shall grant license for commercial or industrial use or occupation of any building without a development permission granted by the respective local authority.

Section 36 states that if in connection with a development application, a local authority is of the opinion that the proposed development activity will have injurious impact on the environment; the applicant shall be required to submit together with the application an environment impact assessment (EIA) report. EMCA, CAP 387 echoes the same by requiring that such an EIA is approved by the National Environmental Management Authority (NEMA) and should be followed by annual environmental audits.

4.5.8 Traffic Act Cap. 403

In Section 51, only proper fuel should be used in vehicles. Similarly, vehicles should be well maintained to prevent any fumes/exhaust that could pollute the environment. All vehicles transporting installation materials will be granted permits authorizing them to transport materials to the site plus all the equipment, lorries and heavy vehicle drivers will possess up to date driving licenses and certificates identifying them and the type of lorries/vehicles/equipment they are authorized to operate, plus deployment of traffic martials to help control the traffic flow.

4.5.9 Building Code 2000

The building code under Septic and conservancy tanks, section 202 allows for installation of septic tanks/ conservancy tanks where a sewer system has not been provided that the proponent abides with the provisions under the set table.

The effluent waste water from the project site will be channelled to the trunk sewer network managed by NCWSC

4.5.10 Lands Act, 2012 No. 6 of 2012

Part II Section 8 provides guidelines on management of public land by National Land Commission on behalf of both National and County Governments. This law in Section 8(b) stipulates that the Commission shall evaluate all parcels of public land based on land capability classification, land resources mapping consideration, overall potential for use, and resource evaluation data for land use planning. Section 8(d) stipulates that The Commission may require the land to be used for specified purposes subject to such conditions, covenants, encumbrances or reservations as are specified in the relevant order or other instrument.

In managing public land the Commission is further required in Section 10(1) to prescribe guidelines for the management of public land by all public agencies, statutory bodies and state corporations in actual occupation or use. In these guidelines management priorities and operational principles for the management of public land resources for identified uses shall be stated. This in essence means that the Commission shall take appropriate action to maintain public land that has endangered or endemic species of flora and fauna, critical habitats or protected areas. As well the Commission shall identify ecologically sensitive areas that are within public lands and demarcate or take any other justified action on those areas and act to prevent environmental degradation and climate change.

Part VIII of the Act provides procedures for compulsory acquisition of interest in land. Section III (1) states that if land is acquired compulsorily under this Act just compensation shall be paid in full to all persons whose interest in the land have been determined. The Act also provides for settlement

programmes. Any dispute arising out of any matter provided for under this Act may be referred to the Land and Environment Court for determination.

The land on which the project is to be developed fully belongs to the proponent and has a valid ownership

4.6 National Institutional Framework

4.6.1 National Environment and Management Authority

The responsibility of the National Environmental Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principle instrument of government in the implementation of all policies relating to the environment. In addition to NEMA, the Act provides for the establishment and enforcement of environmental quality standards to be set by a technical committee of NEMA known as the Standards and Enforcement Review Committee.

CHAPTER FIVE: PUBLIC CONSULTATION AND PARTICIPATION

5.1Introduction

The main purpose of carrying out consultations with community and key stakeholders was to obtain views and concerns from the project affected people regarding the proposed apartment so as to incorporate their contribution into the project development to safeguard the environment and the interest of key stakeholders particularly the local community and project area leadership and agencies directly or indirectly affected by the proposed project.

Stakeholder consultation was conducted to disclose the details of the proposed project, to inform the stakeholders of any potential negative impacts and elaborate on the positive aspects so that informed decision is made by the stakeholders.

The public consultation aimed at achieving the following specific objectives:

i. Collection of additional baseline data/ information on the project area and local community;

ii. Conduct further stakeholder and community consultations and sensitization;

iii. Provide the community and stakeholders with an opportunity to directly interact with the project developer through the EIA Consultants and ask questions, raise issues and concerns pertaining to the proposed project and contribute to the identification of project impacts, mitigation measures and project alternatives.

iv. Facilitate consideration of project alternatives, mitigation measures and trade-offs;

v. Ensure that important impacts are not overlooked and benefits are maximized;

vi. Reduce conflict through early identification of contentious issues;

vii. Provide an opportunity for the public to influence project activities in a positive manner;

Improve transparency and accountability of decision-making; and increase public confidence in the Environmental Impact Assessment process and the proposed project's undertaking.

5.2 Approach to Consultations with Community/Key Stakeholders

The Consultant visited key stakeholders in their offices/workplaces, households and discussed the proposed project. For the area administration, the Area Chief was appointed by NEMA to coordinate and receive both oral and written comments during the public participation meetings.

The EIA employed three main methods of consultations to get the data presented in this report. These are:

i. Questionnaire administration; a total of eighty (80) questionnaires were distributed within a radius of 1.5 Kilometres

ii. Interviews;

iii. Public meetings and discussions with Key Stakeholders and project affected persons;

Key informants included local administration/leaders and community representatives, religious leaders, Private establishments/companies and general members of the community.

5.3 Socio-economic Impacts

The local communities were keen to talk to the EIA field team on the proposed project and they were appreciative of the fact that the consultancy team involved them in a consultative manner. The people encountered participated actively in raising their comments and they expressed their hope that lawful procedures will be taken into consideration during the project implementation. In addition, below are the various social economic aspects that the community members raised:

***Employment*:** Most respondents pointed that the proposed project will create employment to people in all phases of the project. This will also directly contribute to improving the economy of parklands area, Nairobi City County and the wider Kenya.

5.4 Environmental views

Visual blockage

Majority of the residents consulted highlighted obstruction of natural views, sunlight, or sightlines caused by the construction of the proposed apartments as the major impact. The recommendations given included, adherence to the zoning regulations and the project proponent to consider reducing the number of floors,

Solid Waste Management: Waste disposal was highlighted by the local communities as one component from the project activities that will pollute the environment if not properly handled. Respondents proposed waste management methods such as private handler, dust bin installing within the facility, waste recycling, county government disposal/private garbage collectors services.

Waste water management: majority of the respondents consulted raised their concerns on the measures to be put in place to manage waste water. The residents appreciated the presence of a trunk network trunk sewer line managed by NCWSC. However, the raising concerns were whether the existing sewerline can the withstand the increasing effluent volumes.

Storm water: Majority of the respondents encouraged the project proponent to construct a water storage tank to harvest the rain water. This option will boost the availability of water which is scarce in the area as well as reducing flooding cases.

Water Supply: the general area is supplied with water by NCWSC which is not reliable. However, the project proponent shall drill an onsite borehole to supplement the NCWSC supply

Air quality: Majority of the respondents were of the opinion that the dust emissions will increase during the construction. A number of respondents proposed site hoarding, installation of dust Nets. Providing workers with adequate PPES among others. They further recommended sprinkling of water to reduce dust.

5.5 Support for the Proposed Project

Majority of the total respondents consulted were in support of the project. Most of these respondents argued that the proposed development was good and recommendable for general development and basically conformed to the proposed zoning policy in Parklands area. The Immediate land owners cited increase in value of the adjacent land, help in meeting the current housing deficit in Nairobi and especially for the people working within Parklands, creation of employment opportunities among others.

Copies of the dully filled questionnaires are attached herewith

CHAPTER SIX: PROJECT ALTERNATIVES

6.1 Introduction

In deciding on the type of developments to be included in the proposed plan, the project proponent considered various alternatives. Three options were considered as outlined below. Note that for some issues, little data is available on which to base the assessment, and that many of the judgements are subjective. Further, despite a number of detailed technological alternatives at project proponent's discretion, the technology adopted in this project is informed by conventional building trend within the proposed project area. It's worth noting also that only those alternatives with the potential to materially affect the outcome of the environment have been discussed here.

6.1.1 Zero Option/ No Project Development

The zero option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. This option will however, involve several losses both to the landowner and the community as a whole. The landowner will continue to pay rent on the plot while the property remains underutilized. The Option is the least preferred from the socio-economic and partly environmental perspective due to the following factors:

i. The economic status of the Kenyans and the local people would remain unchanged.
ii. The local skills would remain underutilized.
iii. Reduced interaction both at county, national and international levels
iv. No employment opportunities will be created for Kenyans who will work in the proposed project.
v. No housing provided to alleviate a critical shortage of residential units
vi. Development of infrastructural facilities (roads, electrical etc.) will not be undertaken. From the analysis above, it becomes apparent that the No Project alternative is no alternative to the local people, Kenyans, and the Government of Kenya.

6.1.2 Relocation Option

Relocation option to a different site is an option available for the project implementation. At present the landowner/developer does not have an alternative site. This means that he has to look for the land. Looking for the land to accommodate the scale and size of the project and completing official transaction on it may take up to three (3) years although there is no guarantee that the land would be available. The developer will spend another two years on design and approvals since design and planning has to be according to site conditions. Project design and planning before the stage of implementation will cost

the developer hundreds of thousands of Kenya shillings. Whatever has been done and paid to date will be counted as a loss to the developer. Assuming the project will be given a positive response by the relevant authorities including NEMA, this project would have been delayed for about two (2) years period before implementation. This is a delay that our economy can ill afford. This would also lead to a situation like No Project Alternative option. The other consequence of this is that it would be a discouragement for private/investors especially in the housing sector that has been shunned by many public and private investors already aggravating our critical housing shortages. In consideration of the above concerns and assessment of the current proposed site, relocation of the project is not a viable option.

6.1.3 Alternative Land use

The proponent has no option to use the land for other purposes other than proposed residential apartments development.

6.1.4 Proposed Alternative

Various alternatives methods for development of the proposed project were considered including;

i. Technology Alternatives: Comparing different technologies or methods for implementing the project (e.g., construction methods, machinery types

ii. Design alternatives; Examining different layouts, sizes, or designs that may reduce environmental impacts.

iii. Input alternatives; Substituting materials, fuels, or inputs that are more environmentally friendly or cost-effective.

iv. Operational Alternatives; Varying the timing, scale, or intensity of operations to minimize harm (e.g., hours of operation, seasonal timing)

CHAPTER SEVEN: IDENTIFICATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

7.1 Basis of Identification of Impacts

In order to accurately identify the environmental impacts, the following environmental issues were considered pertinent and important as per the Terms of Reference.

7.1.1 Physical Environment (Biophysical Impacts)

a) Water quality aspects for both surface water sources like piped water, storm water, and other related aspects.
b) Soil conditions, soil contamination and landscape alterations/degradation (based on aesthetic aspects) associated with the proposed project.
c) Drainage patterns especially in relation to waste water effluents
d) Air quality aspects especially atmospheric emissions and related discharges from machinery like diesel run equipment etc.
e) Noise and vibrations where applicable

7.1.2 Natural Environment

f) Flora and fauna (i.e. effects to natural plants and animals where applicable).
g) River pollution indicators, impacts on water flow patterns and quality aspects, user interference and contamination.
h) Topography: effects on soil and landscape.

7.13 Social welfare, Economic and Cultural Environment

i) Determination of implications to the human society distribution, demographic details, settlement patterns, changes to the cultural lifestyle and indigenous knowledge of the local society/public where applicable.
j) Notable changes in land use systems and the general land utilization types where applicable.
k) Aesthetic, landscape alterations and changes to infrastructural facilities, among others.
l) Effects associated with the construction and operation activities and related handling and disposal of wastes generated during the operations.
e) Effects associated with income generation opportunities created by the project due to the upcoming operations.
f) Implications on the employees, visitors and public health, safety and related hazards/risks such as HIV/AIDS, consumption of contaminated intravenous infusions products due to disease outbreaks, sanitary facilities, etc.
g) Introduction of nuisances, such as pests, invasive species and related multiplication

breeding sites

7.2Description of the Existing and Anticipated Impacts

7.2.1 Existing impacts

During the time of the study, it was established that the proposed project area has been experiencing traffic jam especially at peak hours.

7.2.2 Anticipated impacts

The anticipated impacts of the proposed project on the environmental elements are both positive and negative. The magnitude of each impact is described in terms of being significant, minor or permanent, short-term or long term, specific (localized) or widespread, reversible or irreversible. The table below shows the assessment criteria for the significant impacts are.

Table 1. Assessment criteria for significant impacts

Key	Type of impact	Key	Type of impact
++	Major positive impact.	+	Minor positive impact
--	Major negative impact	-	Minor negative impact
0	Negligible/Zero impact	NC	No change
Sp	Specific/Localized impact	W	Widespread impacts
R	Reversible impacts	Ir	Irreversible impacts
Sh	Short term impacts	L	Long term impacts
T	Temporary impacts	P	Permanent impacts

On the basis of information gathered during the desktop and field study, the potential environmental impacts of the proposed project are tabulated below:

7.3 Positive Impacts

There are a number of positive benefits associated with the proposed development. The Following are some of the positive benefits anticipated:

Table 2; Positive Impacts of the Proposed Development and Justification

No.	Positive Impacts	Justification
1	Provision of modern housing units to the residents	The proposed project will provide housing units to the residents with emphasis on their safety and well - being.
2	Generation of direct and indirect employment and income.	Besides the direct employment by the proposed development, other forms of employment are likely to result from the spillover effects, through indirect services During the construction and operation phases. The employment opportunities will generate income and improve the living standards of the local population and its environs.
3	Contribution To Government Revenue	Through payment of relevant taxes, rates and fees to the national and county governments, the project will Contribute towards the national and local revenue earnings. The proponent will receive returns on his investments hence increases in wealth.
4	Improved Security.	Security will be ensured around the proposed development Through distribution of suitable security lights and presence of 24 hour. This will lead to improvement in the general security in the surrounding area.
5	Social amenities such as Schools, churches, Creation of market for local goods and services.	The proposed project will boost social amenities in the general area and this will stimulate more development. The proposed project will create demand for construction materials and local produce and this will greatly benefit small scale businesses within the project area.

7.4 Specific Negative Impacts during Construction and Operational Phases and Mitigation Measures

The issues that are seen as likely to negatively affect the environment and population therein Include the following:

7.4.1 Air quality

Construction Phase

Dust is likely to be generated due to excavation activities, during building construction and deliveries of raw materials. There will be minimal air pollution due to combustion of fossil fuels expected from transportation and construction machinery and dust from excavation activities. The proponent will ensure that plant and equipment which will be acquired for on site preparation of pre-cast materials and concrete mixing will utilize the latest technology to have minimum emission.

Operational Phase

During operational phase, air quality is not likely to be affected.

Potential mitigation measures

i. Provision of full protective gear for workers. Workers shall also be sensitized on hazards encountered in such work environment and shall undergo regular health check-ups.
ii. Watering access roads and the site to suppress dust
iii. Covering truck loads using tarpaulins
iv. Personnel will be also provided with dust masks to avoid inhalation of the same.

7.4.2 Soil Erosion

Construction Phase

The activities involved in the site preparation and construction phase of the development may have a major negative and moderate impact on soil and geology of the project site. This is due to the removal of vegetation from the site which will leave considerable areas of soil exposed to the elements, which may result in soil erosion. Heavy machinery will be traversing the site due to the construction activities this may lead to soil compaction and erosion of the soil. Uncontrolled soil erosion can have adverse effects on the local water bodies.

Operational phase

The building and pavements will lead to increased volume and velocity of storm water or run-off flowing across the area covered by the buildings. This will lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems in addition to increased erosion or water logging in the neighbouring areas.

Potential mitigation measures

Excavation should be done under controlled conditions which will include minimizing vegetation removal, avoiding creating large open expanses of bare soil, creating wind breaks, using of single or few designated tracks to bring vehicles into the area and watering using water.

Landscaping should be done on the land during the operation phase and de-commissioning phase to

ensure that the same is returned to its original state. The contractor should also provide adequate soil conservation structures to ensure that areas prone to soil erosion are protected from run-off.

7.4.3 Solid Waste

Construction Phase

A significant amount of solid waste will be generated in this phase through the clearing of vegetation. The other activities that will generate related solid wastes include stones, wood, broken glasses, containers, rods of metal, cement bags, sharp objects (nails) etc. This will therefore have a major negative short-term impact on solid waste collection in the area. The proponent should take the initiative of removal of the solid waste which is expected to be generated during this phase of the development.

Operational phase

The project is expected to generate enormous amounts of solid waste during its operation phase. Solid waste will be generated from the residential houses and the associated facilities. The accumulation of solid waste can cause the proliferation of domestic pests such as rats (*Rattusnorvegicus*and *Rattusrattus*. These vermin are very destructive and can rapidly multiply especially where garbage collection is infrequent and therefore food is abundant. This phase may also encourage stray animals such as dogs which can be nuisance species because they may bring with them ecto-parasites such as fleas (*Ctenocephalidescanis*) and ticks (*Ixodes sp.*) which can create health problems for domestic pets.

The bulk of the solid waste generated during the operation of the project will consist of domestic waste such as 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 is not biodegradable may cause long term injurious effects to the environment. Even the biodegradable ones such as organic wastes may be injurious to the environment because as they decompose, they produce methane gas, a powerful greenhouse gas known to contribute to global warming.

Potential mitigation measures for solid waste

Express condition shall be put in the contract that before the contractor is issued with a completion certificate; he will clear the site of all debris and restore it to a state acceptable to the supervising architect and environmental consultant.

Materials from excavation of the ground and foundation works shall be reused for earth works and landscaping.

Bins/ receptacles shall be placed at strategic locations within the site as collection centers to facilitate separation and sorting of the various types of wastes.

The contractor and proponent shall work hand in hand with licensed private refuse handlers and Parklands Sub-County to facilitate sound waste management.

The wastes shall be properly segregated and separated to encourage recycling of some useful waste

materials i.e. some demolished stone and concrete materials can be used as backfills.

Use of an integrated solid waste management system through a hierarchy option i.e. source reduction, recycling, composting and reuse shall be encouraged. This will facilitate proper handling of solid waste during operation stage.

7.4.4 Noise pollution

Construction phase

This phase of the development may likely have the most negative impact to the ambient noise and vibration in the development area. A number of measures may be undertaken by the developer to reduce the impact of noise on the existing and potential residents as well as the workers involved in the project. This is temporary, however, and the aim at this point is to make the increase in noise as small as possible until this phase is complete. The cumulative impact of the construction activities occurring simultaneously with the other proposed developments for the area may increase the noise and vibration levels in the area significantly.

Operation Phase

This phase is not likely to cause noise pollution as residential activities do not cause any significant noise.

Proposed mitigation measures

Equipment to be used should be selected on the basis of the noise minimization during acquisition.

Equipment should also be properly maintained while in use during the construction phase. The equipment to be used should be located far away from the receivers and also so as to prevent interference, the proponent should ensure that construction is done between 8:00am - 5:00pm.

The proponent should also establish the noise levels during construction and install appropriate noise barriers and acoustic screens.

7.4.5 Increased Water Demand

Construction Phase

This phase of the development might place a strain on an already limited supply through the construction of buildings and other infrastructural works proposed for the development. This will create additional demand to the water supply within the project vicinity as most people source water from county which is unreliable. The impact on water availability will therefore be compatible and short-term.

Operational phase

The operation phase of the proposed development might place a strain on the water availability in the area. Even with the use of recycled water for irrigation, the current supply will have a cumulative major negative impact on already limited supply. This phase of the development will therefore have a major negative long-term impact on the water availability in the area.

Potential mitigation measures

i. Provision of notices and information signs within the project site to notify on means and needs to conserve water resource.
ii. Installation of water conserving taps will be done.
iii. Encourage water recycling during both construction and occupation phases of the project.
iv. Practice rain water harvesting to supplement the NCWSC and borehole supply.

7.4.6 Surface Drainage/storm water

Construction phase

Clearance of land and excavation works will lead to increased soil erosion at the project site and release of sediments into the drainage systems.

Operational phase

The building roofs and pavements will lead to increased volume and velocity of storm water or run-off lowing across the area covered by the buildings. This will lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems.

Potential mitigation measures

Leveling the project site to reduce run-off velocity and increase infiltration of rainwater into the soil.

Drainage channels shall be installed in all areas that generate or receive surface water. The channels will be covered with gratings or other suitably approved materials to prevent occurrence of accidents and dirt entry that may compromise flow of run-off.

The channels shall be designed with regard to peak volumes. Paving of the side-walks, parking and other open areas shall be done using pervious materials i.e. concrete blocks to encourage water percolation thus reducing run-off volume.

7.4.7 Oil Leaks and Spills

It is important to note that oil/grease spills are prevalent in construction sites and in most areas that make use of petroleum products. Such products contain detrimental elements to the environment. They contain such heavy metals as mercury, lead, and sulphur among others. Though this may not be common at the site, it is wise to control and observe the little that could occur especially during maintenance of the involved machinery.

Potential Mitigation Measures

All machinery must be keenly observed not to leak oils on the ground. This can be affected through regular maintenance of the machinery.

Maintenance must be carried out in a designated area (protected service bays) and where oils are completely restrained from reaching the ground. Such areas should be covered to avoid storm from

carrying away oils into the soil or water systems. Waste water/ wash water from these areas should be properly disposed.

All oil products and materials should be stored in site stores or in the contractor's yard. They should be handled appropriately to avoid spills and leaks.

Car wash areas and other places handling oil activities within the site must be well managed and the drains from these areas controlled. Oil interceptors must be installed along the drainage channels leading from such areas.

7.5 Socio-Cultural and Socio-Economic Impacts

7.5.1 Increase in Population

There is currently no evidence of overcrowding around the development area and therefore there will be minimal variations on its demography. The population growth rates in the area are not expected to be consistent in the future however, as there has been a significant increase in the number of approved and proposed developments for the Upper hill area. These proposed developments will serve to attract migrants to the area who will be seeking employment during construction phase. This will result to an increase in population.

In the operational phase, the area will experience immigrants who will become the new residents of the constructed houses and this will impact on the population of the area.

Proposed mitigation measures

Planned settlement, ensuring that adequate social and other infrastructure meet the needs of migrants.

7.5.2 Employment and Income

Majority of the residents highlighted job opportunities as a major positive impact. Any available jobs will provide an immediate positive impact on the employment and income situation at the level of the study area as well as at the county and national levels. This phase of the development will provide the most benefits in terms of sustained employment and increase in income. Initially, the site preparation phase will employ specific vehicles and equipment in order to clear vegetation, for landscaping and grading and levelling and the cutting of access roads for these vehicles and labourers to access the site. This means that many skilled workers will be necessary to operate front-end loaders, excavators, bulldozers and backhoes and other vehicles. In addition to these semi-skilled labourers will still be necessary for other tasks. This phase of the development will therefore have a short-term major positive impact on the employment and income at the local level. During operation phase, employment opportunities will be created e.g. at the laundry and maintenance personnel.

Proposed mitigation measures

The proponent should encourage recruitment of labour from the locals for unskilled and semi-skilled labour. For skilled labour this will depend on how much is available locally and the shortfall shall be supplemented by artisans from outside.

The proponent will give equal opportunities to women where possible.

7.5.3 Increased Energy Demand

The construction and operation phases of the development will impact slightly on the electricity supplying the area as well as demand will increase.

Proposed mitigation measures

All electrical appliances should be switched off when not in use during construction and operation phases.

Use of energy conserving electric lamps for general lighting during operational phase.

Residents should utilize natural light when inside their houses to avoid using electricity for lighting during the day.

The contractor should ensure that all buildings have access to natural light during the day.

The proponent should consider installation of renewable energy sources such as solar panels.

7.5.4 Workplace Accidents

Workers at the site may be exposed to various workplace accidents especially during construction period. These include being hit by falling objects and falling off from elevated heights among others. During operation period, accidents may include exposure to exposed electrical parts.

Potential mitigation measures

Occurrences of accidents may be prevented by observing the following:

i. Ensuring that the operational manuals are available and accessible for every equipment/machinery used at the site.
ii. Proper maintenance of all machinery and equipment to prevent premature failure or possible accidents
iii. Ensuring all electrical equipment and machinery are properly grounded
iv. Only properly trained employees to operate equipment or machinery and proper instructions in their safe operation is provided.
v. Workers to wear personal protective equipment (PPE)
vi. Naked wires should always be sealed

7.5.5 Site Security

Security of the site and those working within is of utmost significance and those operating within the facility must be assured of their security at all times. Security lapses that may lead to injury of occupants

of the building and loss of personal property should be taken care of.

Potential mitigation measures

The management shall strategically install lighting as well as security alarms and backup systems including surveillance of the area on a 24 hours basis.

Security guards shall guard the property in a 24-hour basis and document any suspicious movement within the facility and its environs.

7.5.6 Fire Hazards

The operations that lead to fire outbreaks include poor handling of electricity systems, faulty electrical equipment, carelessness etc. These should be avoided both during construction and operation phases of the project.

Potential mitigation measures

In this regard, the design of the project has provided and recommended implementation of fire-fighting measures and control facilities. These include the following:

i. Installation of an automatic fire alarm system for the estate
ii. Provision of fire-fighting equipment and hydrant points
iii. Display fire evacuation procedures and emergency at the buildings
iv. Regular maintenance of fire electrical and first aid equipment
v. Provision of sufficient fire exit points and fire assembly points

7.5.7 Road Infrastructure

Traffic along the access road may increase during construction phase since vehicles will be accessing the site to deliver construction materials, to take away waste materials and experts coming for supervision purposes. The roads in their current states will be able to handle this increased traffic including for heavy-duty equipment traffic. This phase of the development may have a major negative impact of surface status deterioration on the present road network in the study area.

Operational Phase: During the operation phase of the project, there might be a major negative impact on the road network in the area as the volume of traffic associated with the development will increase significantly, therefore placing a strain on the existing road network. Within the immediate environs of the project site the following traffic measures and rules will be observed:

i. Maximum speed limit within this area will be 20km/hr for both operation and personal vehicles
ii. Speed limits and all other road signs and traffic rules shall be strictly observed.
iii. Vehicles will be used for the purposes to which they are intended only.

7.5.8 Occupational Health and Safety (OHS)

Construction phase

During the proposed project construction works, there may be increased risks to health and safety such as dust, air, and noise pollution. The workforce and general public involved would be more subjected to these possible environmental hazards and disturbances. Food for the construction workforce is usually provided by individuals most of who in most cases operate without public health licenses. This can compromise health of the workers especially if such foodstuff is not prepared following strict hygiene standards. Flammable substances including diesel and motor oil may be stored or used within the project site for heavy-duty equipment. These substances are precursors for fires and explosions, which may range from small incipient to larger fires of great intensity, which generates heat causing damage to property, injuries or loss of human life.

Operational phase

It is expected that most residents will use LPG for cooking which is also highly flammable, which may increase the vulnerability of the operation to a fire or an explosion.

Potential mitigation measures

During construction, the contractor will be required to prepare a waste management plan for the work-sites and equipment camp at the start of the project. The site is to be kept clean, neat and tidy at all times. The contractor shall implement measures to minimize waste and develop a waste management plan to include the following:

i. All personnel shall be instructed to dispose off waste in designated waste baskets.
ii. At all places of work, the contractor shall provide litter collection facilities.
iii. The final disposal of the site waste shall be done at the location that shall be approved by the engineer on site. This must be in full recognition of the existing legal requirements.
iv. There shall be provision of sufficient bins to store the solid waste produced on a daily basis.
v. Wherever possible, materials used or generated by construction shall be recycled. Provision shall also be made of responsible management of any hazardous waste generated during the construction works.
vi. Workmen shall be provided with suitable protective gear (such as dust masks, ear muffs, helmets, overalls, industrial boots etc.) particularly during construction. There must be fully equipped First Aid kits on site and a safety officer who has First Aid training and knowledge of safety procedures. In addition, the contractor must have insurance for the workmen.
vii. The contractor will be required to adhere to Occupational Safety and Health Act (OSHA) 2007, especially the building operations and works of engineering construction rules and its subsidiary and supplementary regulations on safety and public health in the construction activities.

7.5.9 Social Conflict with the Community

Projects of such magnitude usually attract public uproar (especially from the neighbouring residents and community) if they are not made to own the project. Conflicts usually arise mostly from the foreseen negative impacts and increased interactions from the increase in population levels.

Potential Mitigation measures

Consultation with neighbours on the mitigation measures prescribed for the negative impacts as a way of conflict resolution and neighbourhood association. The proponent will give women equal employment opportunities as men whenever possible. The proponent will give priority to the local community in allocation of jobs at both skilled and unskilled level

CHAPTER EIGHT: ENVIRONMENTAL MANAGEMENT PLAN (EMP)

8.1 introduction

Integrating environmental issues in business management, such as those related to development increases efficiency while enhancing the project proponent financial and environmental management. These issues, which are normally of financial concern, are: costs, product quality, investments, level of productivity and planning. Environmental planning and management as a concept seeks to improve and protect environmental quality for both the project site and the neighbourhood through segregation of activities that are environmentally incompatible. Environmental planning and management integrates land use structure, social systems, regulatory law, environmental awareness and ethics.

Environmental management plan (EMP) for development projects such as the proposed multi-dwelling development aims at providing a logical framework within which identified negative environmental impacts can be mitigated and monitored. In addition, EMP assigns responsibilities for action to various actors, and provides time frame within which mitigation measures can be done. EMP is a vital output for an environmental impact assessment as it provides a check-list for project monitoring and evaluation. A number of mitigation measures are already incorporated into the project design. The EMP outlined in Table 8-1 has addressed the identified potential negative impacts and mitigation measures for the proposed hotel development.

8.2 Environmental Monitoring and Evaluation

Environmental monitoring and evaluation are essential in the project lifespan as they are conducted to establish if the project implementation has complied with the set environmental management standards as articulated in the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, and its attendant Environmental (Impact Assessment and Audit) Regulations, 2003.

In the context of the proposed project, design has made provisions for an elaborate operational monitoring framework for the following among others:

(a) Disruption of natural environment and modification of micro-climate

(b) Air and noise pollution

(c) Proliferation of related businesses

(d) Worker's accidents and health infections during construction process

(e) Table 8.1: Environmental Management Plan

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	RESPONSIBILITY	COST (KES) ESTIMATE	MONITORING MEASURES
IMPLIMENTATION PHASE				
Commissioning of the Construction Works	- Site hand-over and Ground breaking	Project team (Lead Consultant/Architect, contractor Proponent)	Part of/Covered in the Project Cost	Presence of the project Team
Securing the Construction Site	- Site hoarding	Contractor Proponent	400,000	Presence of Perimeter Fence
Security for Construction Material	- Construction of Site Stores - Construction materials to be delivered in small quantities to minimise storage problems	Contractor Proponent	200,000	Presence of Site store
Extraction and Use of Building Materials	- Availability and sustainability of the extraction sites as they are non-renewable in the short term - Landscape changes e.g. displacement of animals and vegetation, poor visual quality and opening of depressions on the surface - Ensure suppliers are licensed by NEMA	Contractor/Proponent /project team	Part of/Covered in the Project Cost	Material site rehabilitation
Collapse of Building during Construction	- Ensuring Building Strength and stability - Use of appropriate construction materials and reinforcements as per specifications - Ensuring building components are as per designs - Proper supervision - Ensure proper timelines are followed e.g. curing time	Contractor Proponent project team	Part of/Covered in the Project Cost	Presence of the project Team
Disturbance of Traffic flow during construction	- Proper signages at the construction site - Awareness creation - Education to truck drivers - Adherence to the traffic management plan	Contractor/Project team and general public	600,000	- Presence of site Notice Board /Hoarding - Presence of Security guards to control traffic - warning signs

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	RESPONSIBILITY	COST (KES) ESTIMATE	MONITORING MEASURES
CONSTRUCTION PHASE				
Soil Excavation leading to site disturbance	- Excavate only areas to be affected by buildings - Dumping of excess excavated materials to sites designated by NEMA and County - Restoration of sites Excavated	Contractor proponent	6,000,000	Landscaping after completion of construction
Soil Erosion	- Create and Maintain soil traps and embankments. - Landscaping after completion of construction - Excavated soil to be used for back filling - Develop soil erosion management measure.	Contractor/Proponent, Architect/Site engineer Landscape Architect	1,000,000	Lack/Absence of Soil Erosion
Noise Pollution and Vibration	-Switch off engines not in use - Construction work to be confined to between 7am to 5pm -Ensure use of earmuffs by machine operators - Provide and enforce use of PPE e.g ear muffs/ear plugs - Proper servicing of machinery and equipment (oiling and greasing) - Monitor noise levels as per NEMA guidelines	Proponent and Contractor	1,000,000	Lack of complaints from the immediate neighbours
Air pollution	- Water sprinkling on driveways or the use of biodegradable hydrant e.g. Terraform polymer will reduce dust emission during construction - Ensure servicing of vehicles regularly - Cover loads of friable materials during transportation. - Control speed of construction vehicles and switch off machines when not in use. - Provide PPE to workers.	Proponent and Contractor	700,000	- Lack of complaints - Workers wearing protective clothing and earmuffs
Risks of Accidents and Injuries to Workers	- Education and awareness to all construction workers - Ensure use of appropriate personal protective clothing - Provide First Aid Kits on site - Ensuring Building Strength and stability - Proper supervision	Proponent Contractor	1,000,000	- Presence of well-equipped First Aid kit Presence of Security Guards on site Presence of a register on the site
Health and Safety	- Provide First Aid Kits on site - Proper signages and warning to public of heavy vehicle turning	Proponent	1,000,000	- Presence of well-equipped First Aid kit

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	RESPONSIBILITY	COST (KES) ESTIMATE	MONITORING MEASURES
	- Ensuring Building Strength and stability - Provide clean water and food to the workers - The contractor to abide by all construction conditions especially clause B12 which stipulates health safety and workforce welfare - Personnel to stick to standard operation procedures - Personnel to wear complete protection gear - Provision of fire-fighting equipment - Put in place an emergency response plan. - Put in place guideline for operation of machinery and appliances and ensure workers are aware of the same. - Comply with Kenyan safety policy and safe working procedures, laws and regulations	Contractor		- Presence of Security Guards on site - Presence of a register on the site
Solid Waste Generation	- Ensure waste materials are disposed of on County and NEMA approved sites - Use of the 3rs – Reduce, Re-use, Re-cycle - Solid waste to be put in designated areas for appropriate disposal (waste cubicle) - Waste segregation to at source - Engage a licensed, competent and effective waste handler	Proponent Contractor	5,000,000	- Absence of Solid waste on the site
Energy Consumption	- Use electricity sparingly since high consumption of electricity negatively impacts on these natural resources and their sustainability - Use of Standby Generators - Use of renewable sources of energy i.e. solar panels	Proponent Contractor	3,000,000	- Presence of KPLC power lines - Presence of generator
Excessive Water Use	- Excessive water use may negatively impact on the water source and its sustainability - Getting supplementary source of water i.e onsite borehole - Installation of toilet flushes with low volume cisterns - Recycling of water	Proponent Contractor WRA	1,000,000	- Metering of water

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	RESPONSIBILITY	COST (KES) ESTIMATE	MONITORING MEASURES
OCCUPATION PHASE				
Architectural incompatibility leading to distortion of neighbourhood aesthetic image	- Adhere to zoning policy of the area - Harmonise detail, material and finishes for the building with existing developments in the neighbourhood.	Architect Proponent Contractor	Part of/Covered in the Project Cost	- Compatibility with the area zoning policy
Solid Waste Generation and Management	- Regular inspection and maintenance of the waste disposal systems during operation phase - Establish a collective waste disposal and management system - Provide waste disposal bins to each suite well protected from adverse weather and animals - Ensure waste materials are disposed off on County approved sites - Engage a NEMA licensed waste handler to transport the waste - Use of the 3rs – Reduce, Re-use, Re-cycle	Proponent Contractor	1,500,000	- Presence of NEMA registered waste management companies - Presence of waste handling bins - Absence of wastes
Liquid Waste Generation and Management	-Regular inspection and maintenance of the waste disposal systems during the operation phase - Proper connection to the trunk sewer system maintained by NCWSC - Routine check-ups and monitoring of the channel linkage to the sewer line to avoid leakages and blockages. - Construction of separate storm water drainage channel	Proponent Contractor	3,000,000	- Absence of liquid wastes
Increased loading on Infrastructure services - Increased vehicular and/or pedestrian traffic - Increased demand on water, sanitation services	- Have paved road drainage system - Encourage rainwater harvesting - Provision of increased water storage capacity - Provide adequate storm water management system	Contractor Proponent	1,000,000	- Absence of run-off - Presence of good roads - Pavements and drainage channels
Traffic	- Provide adequate parking facilities within the project site	Contractor Proponent	Routine operation procedure	- Presence of amble parking in the premises
Increased social conflict	- Increased economic activities –employment generation and income earnings	Contractor Proponent		-Good relationship with neighbours

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	RESPONSIBILITY	COST (KES) ESTIMATE	MONITORING MEASURES
	- Encourage good relation with the neighbours through neighbourhood associations			-absence of conflicts
Storm water impacts	- Provide roof gutters to collect and direct roof water to storage tanks and direct the excess to the drains. - Construct drains to standard specifications - Develop a storm water drainage system and linkage to natural drains	Proponent Contractor	900,000	Absence of Flooding and dampness within the facility
Disruption of existing natural environment and modification of micro-climate: - Increased development density - Increased glare/solar reflection - Reduced natural ground cover/surface run-off - Obstruction of ventilating winds	- Development restricted to follow zoning policy/approved density – building line, plot coverage and plot ratio. - Careful layout and orientation of buildings to respect wind and sun direction. - Adequate provision of green and open space planted with grass, shrub and tree cover. - Minimum use of reflective building material and finishes for roof, wall and pavement. - The balconies should have garden	Project team (Contractor Proponent, Architect or Lead Consultant, etc.)	600,000	Proper orientation Planted trees/Landscaping
Insecurity	- secure the premise with a perimeter wall and an electric fence - Installation of CCTV cameras at strategic points - Have entry points manned 24 hours - Construction of gate houses	Contractor Proponent	2,000,000	Presence of perimeter wall Presence of day and night security guards
DECOMMISSIONING PHASE				
Building Safety	Assess the condition of buildings to ascertain usefulness	Engineer Proponent	1,000,000	Engineer and Tests on the building
Land and Building use	Ascertain the Planning development policy	County Physical Planner	200,000	Consultants present
Accidents/Injuries	Securing the Site by fencing off	Contractor Proponent	1,000,000	Presence of perimeter fence

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	RESPONSIBILITY	COST (KES) ESTIMATE	MONITORING MEASURES
Un-disconnected Services e.g. Power, Water, telephone, sewer etc.	Ensure disconnection of all services Remove all surface and underground cables and wiring	Contractor	2,000,000	Absence of cabling
Solid Waste Generation (demolition waste)	Ensure waste materials are disposed of on County and NEMA approved sites Ensure re-use of materials that can be re-used -Use of the 3rs – Reduce, Re-use, Re-cycle	Proponent/Contractor	2,000,000	Absence of Debris
Noise and Vibration	- Ensure use of serviced equipment - Switch off engines not in use - Demolition work to be confined to between 8am to 5pm - Ensure use of earmuffs by workers	Proponent Contractor	100,000	Lack of complaints from the neighbours

CHAPTER NINE: ENVIRONMENTAL HEALTH AND SAFETY (EHS)

9.1 EHS Management and Administration

The EHS is a broader and holistic aspect of protecting the worker, the workplace, the tools/ equipment and the biotic environment. It is an essential tool in determining the EIA study. The objective of the EHS on the proposed project is to develop rules that will regulate environmentally instigated diseases and occupational safety measures during construction and the operation phases of the proposed project by:

- Avoidance of injuries
- Provision of safe and healthy working environment for workers' comfort.
- Control of losses and damages to plants, machines, equipment and other products.
- Enhance environmental sustainability through developing sound conservation measures.

9.2 Policy, Administrative and Legislative Framework

It is the primary responsibility of the contractor to promote a safe and healthy environment at the workplace and within the neighbourhood in which the proposed project will be constructed by implementing effective systems to prevent occupational diseases and ill-health, and to prevent damage to property. The EHS Management Plan when completed will be used as a tool and a check-list by the contracted engineers in planning and development of the construction of this project.

9.3 Organisation and implementation of the EHS Management Plan

The contractor shall use the EHS plan at the proposed project site both during construction and operation. The engineer will use it during construction phase with the assistance of an EHS consultant.

9.4 The Guiding Principles to be adopted by the contractor

The company will be guided by the following principle: -

- It will be a conscious organisation committed to promotion and maintenance of high standards of health and safety for its employees, the neighbouring population and the public at large.
- Ensuring that EHS activities are implemented to protect the environment and prevent pollution.
- Management shall demonstrate commitment and exercise constant vigilance in order to provide employees, neighbours and the environment, with greatest safeguards relating to EHS.
- Employees will be expected to take personal responsibility for their safety, safety of colleagues and of the general public as it relates to the EHS management plan.

9.5 EHS management strategy to be adopted by the contractor

The following strategies will be adopted to achieve the above objectives

- Create an Environment Health and Safety Management committee and incorporate EHS as an effective structure at various levels and units to manage and oversee EHS programs in all construction and operation phases of the project
- Maintain an effective reporting procedure for all accidents.
- Provide appropriate tools and protective devices for the success of the project.
- Encourage, motivate and reward employees to take personal initiatives and commitment on EHS.

9.6 Safety Agenda for both the proponent and contractor

There will be a permanent EHS agenda during construction.

(a) Contractors

The EHS management plan code of practice shall be applicable to the contractors working in the premises, and shall be read and signed. This should also remind the contractor of his/her;

- Legal requirements.
- Statutory obligations.
- Obligation to lay-down a system for reporting accidents
- Responsibility to ensure that his/her employees are supplied with personal protective equipment
- Obligation to ensure that he obtains detail of jobs and areas where permit-to-work must be issued

(b) All residents' and workers' responsibility

- Know the location of all safety equipment, and learn to use them efficiently.

9.7 Safety requirement at the project site during construction and operation Period

(a) The contractor

The contractor will ensure that:

- Safe means of entry and exit at the proposed project site.
- Ensure adequate briefing of job at hand on the safe system before commencement of work.

- The EHS coordinator must be in attendance at all times throughout the duration of the project.
- The EHS consultant must maintain constant assessment of the risk involved
- A safety harness must be worn before entry into all confined spaces
- An EHS consultant must be posted at the entrance at the project site to monitor

(b) The Traffic / Drivers

Within the construction premises, the following traffic rules will be observed: -

- Observe speed limits and all other signs and obey traffic rules.
- Use the vehicle for the purpose to which it is intended only.

c) Fire hazard at the construction site,

Workers at the site shall ensure that: -

- Oxy-acetylene cylinders are not contaminated with grease or oil.
- Oxy-acetylene cylinders are not subjected to direct sunlight or heat.
- Oxy-acetylene cylinders are not to be used or stored standing in a vertical position.
- When in use, ensure the inclination should never be over 30° from the vertical.

9.8 Welding at the construction site

It is the responsibility of the contractor during construction to: -

- Ensure that welding clamp is fixed such that no current passes through any moving parts of any machine.
- Ensure that all welding clamps are in good operating condition
- Ensure that welding clamps are free from any contact with explosive vapours.
- Ensure that any slag or molten metal arising from welding activities does not start up fires by:
    - ✓ Clearing combustible material to distance of at least 3 meters away from working area.
    - ✓ Appropriate fire extinguisher is to be kept available for immediate use at all times

9.9 Emergency procedure during construction and operation

An emergency situation means:

- Unforeseen happening resulting in serious or fatal injury
- Fire or explosion.

- Natural catastrophe.

In the event of such an emergency during construction, the workers shall:

- Alert other persons exposed to danger.
- Inform the EHS coordinator.
- Do a quick assessment on the nature of emergency.
- Call for ambulance on standby.

CHAPTER TEN: DECOMMISSIONING

10.1 Introduction

Decommissioning is an important phase in the project cycle and comes last to wind up the operational activities of a particular project. It refers to the final disposal of the project and associated materials at the expiry of the project lifespan. If such a stage is reached, the proponent needs to remove all materials resulting from the demolition/ decommissioning from the site. The following should be undertaken to restore the environment.

- Remove all underground facilities from the site
- The site should be well landscaped by flattening the mounds of soil and
- Planting indigenous trees and flowers
- All the equipment should be removed from the site
- Fence and signpost unsafe areas until natural stabilization occurs
- Backfill surface openings if practical

The table below shows the proposed decommissioning plan:

Table 10.1. EMP for Decommissioning

Expected Negative Impacts	Recommended Measures	Responsible Party	Time Frame	Cost (KShs)
1. Construction Machinery/Structure & Wastes				
Scraps material and other debris	Use of an integrated solid waste management system i.e. through a hierarchy of options. Wastes generated as a result of facility decommissioning activities will be characterised in compliance with standard waste management procedures. The contractor will select disposal locations and the county based on the properties of the particular waste generated.	Project Manager & Contractor	During decommissioning	3,000,000
	All buildings, machinery, equipment, structures and partitions that will not be used for other purposes should be removed and reused or rather sold/given to scrap material dealers.	Project Manager & Contractor	During decommissioning	-
	Where recycling/reuse of the machinery, equipment, structures and other waste materials is not possible the materials should be taken to approved dumpsites.	Project Manager & Contractor	During decommissioning	-
Rehabilitation of project site				
Vegetation disturbance Land deformation: soil erosion, drainage problems	-Implement an appropriate re-vegetation program to restore the site to its original status. -During the vegetation period, appropriate surface water run-off 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 minimise disturbance to newly-vegetated areas;	Project Manager & Contractor	During decommissioning	4,000,000

Expected Negative Impacts	Recommended Measures	Responsible Party	Time Frame	Cost (KShs)
Social- Economic impacts				
-Loss of income -Loss of housing facilities	The safety of the workers should surpass all other objectives in the decommissioning project. -Adapt a project – completion policy; identifying key issues to be considered. -Compensate and suitably recommend the workers to help in seeking opportunities elsewhere. -offer alternative housing facilities	Project Manager & Contractor	During decommissioning	3,000,000

CONCLUSION AND RECOMMENDATIONS

Overview

From the foregoing analysis, the social and economic rating for this project is highly positive. Evaluation of alternatives has already shown that options are limited and costly. Already the proponent has sunk substantial amount of money in the proposed project up to design stage. Further delay of the project is denying all stakeholders the anticipated benefits of the investment. On the other hand, redesigning or relocation will lead to loss of time and money that is already tied in the preliminary costs of the project. The project does not pose major negative environmental impacts. Adequate mitigation measures have been proposed to address any of the anticipated negative impacts arising from the project. The project will create employment and improve income earnings. The project will boost the diminishing housing supply in the country and more in urban areas.

During the preparation of this report for the proposed development, it is observed and established that most of the negative impacts on the environment are rated as medium and short term with no major significant effects. The positive impacts are highly rated and will benefit all stakeholders and the Parklands residents at large. The project proponents have proposed to adhere to prudent implementation of the environmental management plan. They are obtaining all necessary permits and licenses from the relevant authorities and have qualified and adequate personnel to do the project as proposed. They have proposed adequate safety and health mitigation measures as part of the relevant statutory requirements

Conclusion

This study is recommendable and should be approved by NEMA for issuance of an EIA license subject to annual environmental audits after it has been completed and occupied. This will be in compliance with the Environmental Management and Coordination Act CAP 387 and the Environmental Impact Assessment and Audit regulations, 2003. Above all the proponent should carry out Environmental Audit 12 months after the project is completed.

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17. Proposed development site and architectural plans
18. Reference to other EIAs of the area prepared by the consultants
19. Kenya Population and Housing Census, 2019
20. Documents provided by the project proponent

ANNEXES

1. Dully filled questionnaires
2. Appointment letter for meeting coordinator
3. Meeting invitation letters
4. Media Advertisement for the meetings
5. ToR approval letter
6. Approved ToR
7. CVs
8. Certificate of incorporation
9. KRA pin
10. Proof of Ownership (Certificate of lease, Certificate of search)
11. Change of Use
12. Traffic Impact Assessment report
13. Geotechnical Investigation Report
14. Bill of Quantities
15. Notification of approval of drawings
16. Approved architectural drawings
17. Firm and experts' practising licenses