

# **ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT**

**PROJECT: PROPOSED RESIDENTIAL APARTMENTS  
ON L.R No. 209/1790/1 AT PARKLANDS AREA,  
NAIROBI**

**PROJECT PROPONENT: TARABEN SOBHAGCHAND  
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**DATE: DECEMBER 2021**

## DOCUMENT AUTHENTICATION

This Environmental Impact Assessment Study report has been prepared by **Jonathan V. Joseph (NEMA Reg No. 7197)** in accordance with the Environmental Management and Coordination Act (EMCA) Cap 387 and the Environmental (Impact Assessment) and Audit regulations 2015 which requires that every development project must have an EIA report prepared for submission to the National Environmental Management Authority (NEMA). We the undersigned, certify that the particulars in this report are correct and righteous to the best of our knowledge.

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## EXECUTIVE SUMMARY

The last two decades have experienced an unprecedented growth in population characterized with an increase in rural-urban migration. This in turn has created a high demand for residential houses resulting in overwhelming implications on standard housing infrastructure in the country. Efforts to mitigate this has resulted in the government creating strong policies aimed at increasing the number of housing units in the country to the tune of 150,000 units per annum. These policies take cognizance on the role of the private sector and individuals in bridging this gap.

In pursuant to the Environmental Management and Coordination Act section 58 (1) and the Environmental Impact Assessment and Audit Regulations, 2003 part II, an environmental project study was carried out for the proposed residential development project. The study was carried out in order to determine the anticipated environmental impacts of the proposed project and to identify the necessary mitigation measures in order to incorporate sustainable development aspects in the project cycle and at the same time with a view to obtaining the necessary approvals and licenses from NEMA.

The proposed project involves construction of mixed development of one bedrooms and studio apartments. The apartment will have 209 units in total. It will have a basement, ground plus eleven floors (11). Basement and ground floor will be used for as parking while first to eleven floor will have 2 one- bedroom houses and 17 bedsitter houses which will be used for residential purposes, this project will be optimally implemented on an environmentally sustainable basis.

The Environmental Impact Assessment Study (EIA) has been found necessary for this residential project in order to incorporate environmental issues during implementation and operation. Environmental Impact Assessment for such projects is a requirement in Kenya under Environmental Management and Co-ordination Act (EMCA) 1999.

The methodology used, involved desk studies (scoping) and fieldwork. At the scoping stage the potential impacts relevant to projects of this nature were identified. At the field, ground study was conducted as well as public participation. The various mitigation measures, the Environmental Management Plan (EMP) and the consideration of basic principle of sustainable development provided will make the project viable and environmentally sustainable. The basic principles of development include environmental conservation, environmental quality, social issues and promotion of public participation in project planning.

The experts carried out the environmental impact study for the proposed project in accordance with the EIA/EA guidelines developed by NEMA. During the EIA study the project was found to have both positive and negative impacts on biophysical socio-economic and cultural aspects of the environment. The positive aspects of the project will be enhanced while measures to mitigate the negative impacts are proposed. The expected impacts of this project are as summarized below

**Potential Positive Impacts;**

- Increase in the number of residential houses
- Increased land value as a result of the proposed development
- Gains in the national and local economy
- Provision of employment for both skilled and unskilled manpower, Protection and conservation of the surrounding environment as a result of implementation of the recommendation of this EIA project report.

**Negative Impacts**

- Air pollution
- Noise generation during construction
- Risk of injuries to workers
- Oil spillage from construction vehicles
- Exhaust emissions from the vehicles

This report has got different sections as summarized below:

- **Title page**

This is usually the first section of the EIA report. It contains the necessary addresses for the project including name of the project, site name and location, name of the proponent, and name of the consultant who prepared the report.

- **Introduction**

The background of the project and that of the project proponent is given in this section of the EIA report. It also gives the objectives, terms of reference for the EIA study and the methodologies that were used in collecting information during the study.

- **Project description**

This section details the nature of the project. The construction, operation and decommissioning phases of the project. This section of the EIA report helps in scoping for the anticipated impacts.

- **Baseline information**

This section gives detailed information on the biophysical and socioeconomic conditions in the proposed project area. This information also helps in scoping for impacts.

- **Legal and regulatory framework**

It gives a detailed outline of the various laws, policies and regulations that govern the process of EIA in Kenya. It concentrates on the regulations and standards that are applicable in the case of the proposed project.

- **Anticipated impacts and mitigation measures**

This section of the report gives detailed information on the anticipated impacts of the proposed project including the sources of the impacts and provides mitigation measures for each negative impact.

- **Analysis of project alternatives**

Several project alternatives have been discussed in this section of the report and reasons given for the preferred alternative.

- **Consultative public participation**

The report also presents a discussion of the results of the public consultation and participation process and social impact assessment.

- **Environmental Management and Monitoring Plan**

This section presents a tabulation of all the anticipated negative impacts of the project with their mitigation measures, responsible persons, time frame and cost of mitigation.

- **Conclusion**

This section gives a summary of findings of the EIA Study.

- **References**

This section contains the documents which were reviewed during the desk study.

- **Annexes**

It contains attachments of documents that form part of this report. These are; ownership documents, Drawings, filled public participation questionnaires and a copy of lead expert licence.

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### List of Acronyms

EIA	Environmental Impact Assessment
EMP	Environmental Management and Monitoring Plan
NEMA	National Environment Management Authority
W.H.O	World Health Organization
PPE	Personal Protective Equipments
KPLC	Kenya Power and Lighting Company
EMCA	Environmental Management Coordination Act
GHG	Green House Gases
KWS	Kenya Wildlife Services
KPLC	Kenya Power and Lighting Company

## **CHAPTER 1: INTRODUCTION**

### *1.1 Overview*

The last two decades have experienced an unprecedented growth in population characterized with an increase in rural-urban migration. This in turn has created a high demand for residential houses resulting in overwhelming implications on standard housing infrastructure in the country. Efforts to mitigate this has resulted in the government creating strong policies aimed at increasing the number of housing units in the country to the tune of 150,000 units per annum. These policies take cognizance on the role of the private sector and individuals in bridging this gap.

In pursuant to the Environmental Management and Coordination Act section 58 (1) and the Environmental Impact Assessment and Audit Regulations, 2003 part II, an environmental project study was carried out for the proposed residential development project. The study was carried out in order to determine the anticipated environmental impacts of the proposed project and to identify the necessary mitigation measures in order to incorporate sustainable development aspects in the project cycle and at the same time with a view to obtaining the necessary approvals and licenses from NEMA.

The proposed project involves construction of mixed development of one bedrooms and studio apartments. The apartment will have 209 units in total. It will have a basement, ground plus eleven floors (11). Basement and ground floor will be used for as parking while first to eleven floor will have 2 one- bedroom houses and 17 bedsitter houses which will be used for residential purposes, this project will be optimally implemented on an environmentally sustainable basis.

The Environmental Impact Assessment Study (EIA) has been found necessary for this residential project in order to incorporate environmental issues during implementation and operation. Environmental Impact Assessment for such projects is a requirement in Kenya under Environmental Management and Co-ordination Act (EMCA) 1999.

The aim of EIA is to maintain a delicate balance between the human, social economic needs and environmental protection and to enhance sustainability of the available resources. This EIA study is to enable the public, local county government, approving authority and the developer to properly consider the potential environmental consequences of this proposed project. This EIA was

conducted to assess any potential impacts (both positive and negative) that may arise from the proposed project of constructing residential apartments in Parklands.

### **1.2 Terms of Reference**

- A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
- A description of the technology, procedures and processes to be used, in the implementation of the project.
- A description of materials to be used in the construction and implementation of the project and the waste to be generated by the project.
- A description of the potentially affected environment.
- To recommend a specific environmentally sound and affordable waste management system.
- Development of an Environmental Management Plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.
- Propose measures to prevent health hazards and to ensure safety in the working environment for the employees and the neighboring community.

### **1.3 Objective of the EIA Study**

Environmental Impact Assessment Study (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 include the following:

- i) To identify and evaluate the significant environmental impacts of the project.
- ii) Evaluate the impacts of the various alternatives on the project.
- iii) Propose mitigation measures for the significant negative impacts of the project on the environment.
- iv) Generate baseline data for monitoring and evaluating impacts, including mitigation measures during the project cycle.

- v) Highlights environment issues with a view to guiding policy makers, planners, stake holders and government agencies to make environmentally and economically sustainable decisions.
- vi) To incorporate environmental management plans and monitoring mechanisms

## **1.4 Methodology**

The EIA report will utilize a variety of methodology and tools of research to ensure that sufficient information about the project is gathered in order to help in accurate analysis of the likely impacts of the project

### **1.4.1 Literature Review**

The consultant carried out reviews and studies of relevant documents relating to the project area in order to gather environmental information of the project area. Document analysis approach was employed to obtain relevant information on the geographical, cultural, social, economic and biophysical characteristics of the project area and its environs. Some of the documents reviewed include project drawings and designs, Kenyan laws, policies and regulations relating to environmental management, international policies on environmental management among other documents.

### **1.4.2 Site Survey/Observation**

Site survey was conducted on **9<sup>th</sup> November 2021**. This involved physically inspecting and documenting existing features on the site; natural and socio-economic features of importance through direct observations, observation sheets and photography. An extensive field survey was carried out to obtain site information on the social, economic, biophysical, cultural and political environment to complement information gathered during the desk study. In addition, land use and other environmental attributes likely to be affected by the project activities were assessed.

### **1.4.3 Consultation and Public Participation**

This was done through oral , written interviews and public baraza with key informants at the proposed site, such as neighbours and workers of the neighbouring establishments, traders and local residents in the vicinity to the proposed project area.

#### 1.4.4. Impact Identification and Scoping

This involved screening and scoping in order to identify and define the scope of key environmental issues using both local and international standards.

#### 1.4.5. Impact Assessment

The information gathered during the desk and field studies were used to build up the baseline information of the project area and its environs and in evaluating potential impacts. This was on the basis of acquired information, informed judgment and experiences from similar projects. The consultant described the salient prevailing environmental characteristics of the project area and predicted the potential environmental impacts related to the proposed project location, design, construction and operational aspects likely to emanate from the implementation of the project. Ultimately, the nature, magnitude and duration of both positive and negative environmental impacts were assessed.

#### 1.4.6. Impact Interpretation

At this stage we evaluated impacts in terms of their significance, importance and acceptability. The aim was to determine whether the actual and predicted adverse impacts were significant enough to warrant mitigation. The actual and expected impacts were also evaluated against existing standards of quality, legal, policy and regulations (for example the county government and NEMA).

#### 1.4.7. Environmental and Social Management Plan

Risk assessment was done and mitigation measures were then recommended in all identified potential problem areas. An Environmental Social Management Plan for the proposed project was developed. This will be used in environmental reporting, control and monitoring programmes.

The activities, products and byproducts of the process were listed, their potential impacts identified and mitigation measures were put in place to minimize the negative impacts.

#### **Specific issues covered in the project report include but are not limited to:**

- Name of the proponent, address and contact person
- Title of the project
- Objectives and scope of the project

- Nature of the project
- Location of the proposed project, including the physical area that may be affected by the project's activities;
- Types of activities that will be undertaken during the project construction, operation and decommissioning phases;
- Design of the project;
- Materials to be used, products and by-products, including waste to be generated by the project and the method(s) of their disposal;
- Potential environmental impacts of the project;
- Economic and social impacts to the local community and the nation in general;
- Views of the public about the project, indicating representativeness of the potentially affected people; and
- An environmental management plan (EMP) for the entire project cycle to include mitigation measures to be undertaken both during and after implementation of the project, and an action plan for the prevention and management of the foreseeable accidents during the project cycle.

### ***1.5 Project justification***

- The necessary facilities such as accessibility, water and power are adequately catered for.
- The proposed development is in line with the Government's housing policy. It will increase the supply of residential houses.
- The activities involved in the construction, maintenance and management of the proposed development will generate employment for various categories of people.
- The developer is willing to put up environmental mitigation measures.
- An Environmental Management and Monitoring Plan has been formulated to address and mitigate all anticipated negative impacts likely to arise from the project, and therefore the project is expected to be environmentally tenable.



## **CHAPTER 2: BASE LINE INFORMATION**

### *2.1. Administrative Location*

The proposed project is located in Parklands area, Nairobi City County. The proposed residential apartments will be constructed along Chemil Road and Kip Kasbus Road.

### *2.2. Overview of Environmental resources in Nairobi county Region*

Nairobi is well endowed with a pleasant environment that preserves much of its pristine natural beauty. Ponds, seasonal springs, rivers, flooded grasslands, and swamps abound. Unlike other major cities, Nairobi is not situated on a large river or near the sea. Nevertheless, several streams crisscross the city. Streams running from the Ngong Hills to the south and the ridges to the north become the Athi and Nairobi Rivers. Occasionally hippos and crocodiles can be spotted in the Athi River. Other important sources of water for Nairobi are the Chania and Thika Rivers. There is also the manmade Thika dam, which was constructed as a water reservoir. Natural springs feed a number of small swamps in secluded hollows. In addition, temporary wetlands are created with the coming of each rainy season. The planting of eucalyptus trees, however, has drained most of these springs.

Nairobi National Park is another preservation of natural environment. It is covered by a highland forest of hardwoods. A spectrum of birds and animals find their home in the park. The park itself was established in 1948 as an effort by the government to preserve the remaining natural beauty of Nairobi. Nairobi has a bustling population growth. Rapid urbanization and industrialization consume a lot of natural resources, causing alarming environmental degradation. Construction places a very heavy burden on natural resources. Sand is an important construction material; thus, all rivers in Nairobi have been extensively excavated in search of sand. The result has been serious soil erosion. Timber is also used in construction, causing depletion of forests surrounding the city.

### *2.3. The Biophysical Setting of Nairobi County*

#### *2.3.1. Geographical extent*

The proposed site falls within the urban setup Nairobi region. The project is situated in relatively flat topography, which slopes very gently towards the East. Surface drainage is poor, due to the presence of clayey (black cotton soils) (which inhibit the infiltration and subsequent percolation to deeper levels). Despite the low gradient, the area is traversed by several streams, which all flow

in a general East to Northeastern direction. This drainage pattern displayed by the two major rivers flowing towards the northeast is sub-parallel and probably structurally controlled.

### **2.3.2 Climate**

Nairobi County is generally flat with an altitude of 1795 metres above the sea level, this attributes explains the moderate climatic patterns that are experienced in the county. The coldest period is experienced in June and July while the hottest months are January and December. The mean temperatures range between 18 degrees Celsius and 20 degrees Celsius but this is projected to change as a result of climate change and global warming of the necessary measures is not put in place. The County also experience bimodal rainfall that falls in different times of the year. The average amount of rainfall is approximately 1500mm per annum. Soils in Nairobi are red volcanic soils which contain all the major plant nutrients and this enables some of the residents to practise agriculture on large scale and small scale. Water from the proposed borehole will be used for domestic purposes. Water requirement is estimated at 20m<sup>3</sup>/day.

### **2.3.3 Geology structure**

The geology of Nairobi is comprehensively described in Saggerson (1991). Before the formation of the Rift Valley the whole area was made up of Pre-Cambrian Basement System crystalline rocks of the Mozambique Belt. These very old rocks were laid down, metamorphosed, exposed and eroded and were in Pre-Tertiary times an 'ancient' land surface.

In Recent times, volcanic activity has given way to a prolonged erosive period. This resulted in the widespread exposure of volcanic material and a well-developed soil cover, as found at the surface of the present site. A short description of the different volcanic units found in the vicinity of the site at depth, is given below: The Formations are discussed in order of geological age (oldest rocks first). Geological survey of the site will be carried out to determined the type of soil which will advise of the type of foundation to be done.

### **2.3.4 Hydrology**

The main source of water is the Nairobi Water and Sewerage Company as well as borehole water. T drainage in the area is majorly determined by the gradient of the general slope in the area. There is also open and natural storm water drains by the roads.

#### **2.4. Demography**

According to the 2019 Population and Housing Census, there are about 45 million people in Kenya. Of these, nearly 4 million people reside in Nairobi City County. Thus Nairobi supports almost 10 % of the national population. Nairobi City County is growing at the rate of over 3 % p.a. which is above the national average of approximately 2 % p.a. (as per 2014 CIA World fact book). The population has been tremendously increasing on a yearly basis.

#### **2.5. Wildlife resources**

Nairobi has considerable wildlife in the Nairobi national park and reserves. Wildlife resources have attracted tourism trade, supporting the country's economy in addition to providing livelihood to local communities.

#### **2.6. Communication**

There is existing communication infrastructure in the area. For instance there are existing BTSs in the area and many people own mobile phones.

#### **2.7. Energy:**

Majority of the people in Parklands/Ngara area use Charcoal, paraffin, and Liquefied petroleum gas for cooking. A good percentage of the residents also use kerosene. The area is also served with electricity. There is an electricity line opposite to the proposed site.

## CHAPTER 3: PROJECT DESCRIPTION

This E.I.A project report is based on information and consultations with the project proponent, the Architects, Quantity Surveyors, Engineers, Valuers and financial analysis's and details contained in the drawings of the proposed project (attached at the Annex).

### 3.1. Proposed Project

The proposed mixed development will involve construction of one bedrooms and studio apartments. The apartment will have 209 units in total. It will have a basement, ground plus eleven floors (11). Basement and ground floor will be used for as parking while first to eleven floor will have 2 one- bedroom houses and 17 bedsitter houses which will be used for residential purposes, this project will be optimally implemented on an environmentally sustainable basis. The layout the proposed project is attached in the annex.

### 3.2. The proposed Project Location

The proposed project will be located on L.R No. 209/1790/1. The plot is located in Parklands area Westland area in Nairobi City County. The proposed site located is accessed through Chemil Road and Kip Kasbus Road which joins Ngara Road. The google earth below shows the exact location of the proposed site.



Plate 1: Showing the exact location of the proposed site



Plate 2: Showing the larger area

### 3.3. The proposed site current use.

The proposed site currently has a 5 -bedroom bungalow which will be demolished to pave way for the new development. The plate below shows the current condition of the proposed use.



Plate 3: The current site condition

### 3.4. The Project site size

L.R No. 209/1790/1 measures 0.0988 Ha as stated in the relevant document attached hereafter. This parcel of land is sufficient enough to accommodate the proposed development.

### 3.5. *Ownership*

The proposed site (L.R No. 209/1790/1) is registered under Taraben Sobhagchand Shah and Nishul Sobhagchand Shah of P.O Box 13676 Nairobi. This is evidenced by the attached conveyance documents.

### 3.6. *Land Tenure*

The property is registered under a leasehold tenure system for 50 years from 1st of July 1998.

### 3.7. *Neighbourhood Characteristics*

The site under consideration falls in an area that is fast urbanizing. There are a high number of ongoing constructions which are predominantly mixed developments. The main developments within the area includes Commercial premises, educational & residential apartments. The plate below shows the general characteristic of the area.





*Plate 4: Existing development in the neighborhood*

### **3.8. Project Technology**

The construction technology to be used in the project will employ light mechanization and high labor inputs. Locally available equipment, construction materials and labor will be used, which will be provided by a locally registered contractor. Light earth moving equipment will be used at the initial stages especially in the excavation, removal and transportation of soils. Transportation of building materials and waste debris into the site will also involve sizeable trucks.

Concrete mixing and mobile elevator equipments will be installed during the construction. Other equipments will include dump trucks and an assortment of hand tools. As such dust and noise will arise from the operations of the equipments and are likely to be issues of concern. This requires the contractor to undertake the use appropriate technology that will reduce the impact of both noise and dust at the construction site.

The project will employ considerable number of workers at various stages of construction. This will include manual laborers, technicians, foremen and supervisors and a host of professional involved in various fields. Minimal staff will remain during the operation phase.

A registered contractor and several sub-contractors will undertake the construction process. All the construction process will be under the close supervision of the project engineer, city council building inspectors and the project architect.

### **3.9. Project Materials**

#### **3.9.1. Materials and finishes**

The choice of construction material is important to bring out the character and aesthetic value. The floor will be made of cement screed and ceramic tiles, the walls of natural dressed stone with internal plaster painted and ceramic tiles, ceiling of plaster painted and roof finish of corrugated iron sheets.

### **3.10. Description of the Project's Construction Activities**

#### **3.10.1. Pre-construction Investigations**

The implementation of the project's design and construction phase will start with thorough investigation of the site's biological and physical resources in order to minimize any unforeseen adverse impacts during the project cycle

#### **3.10.2.Sourcing and Transportation of Building Materials**

Building materials will be transported to the project site from their extraction, manufacture, or storage sites using transport trucks. The building materials to be used in construction of the project will be sourced from various Counties. Greater emphasis will be laid on procurement of building materials from within the local area, which will make both economic and environmental sense as it will reduce negative impacts of transportation of the materials to the project site through reduced distance of travel by the materials transport vehicles.

#### **3.10.3.Site Clearance**

Currently the proposed site has an old bungalow that will be demolished to pave way for the 12 floor residential apartments.

#### **3.10.4.Storage of Materials**

Building materials will be stored on site. Bulky materials such as rough stones, ballast, sand and steel will be carefully piled on site. To avoid piling large quantities of materials on site, the proponent will order bulky materials such as sand, gravel and stones in bits. Materials such as cement, paints and glasses among others will be stored in temporary storage structures, which will be constructed within the project site for this purpose.



### **3.10.5. Masonry, Concrete Work and Related Activities**

The construction of the building walls, foundations, pavements, drainage systems, perimeter fence and parking area 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 mixers.

### **3.10.6. Roofing and Sheet Metal Works**

Roofing activities will include sheet metal cutting, raising the roofing materials such as clay roofing tiles and structural timber to the roof and fastening the roofing materials to the roof.

### **3.10.7. 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.

### **3.10.8. Plumbing**

Installation of pipe-work for water supply and distribution will be carried out within the entire building. In addition, pipe-work will be done to connect sewage from the premises to the Nairobi Water and Sewerage Company mains sewer line.

### **3.10.9. Landscaping**

To improve the aesthetic value or visual quality of the site once construction ceases, the proponent will carry out landscaping.

## ***3.11. Description of the Project's Operational Activities***

### **3.11.1. Residence**

A total of 205 households will reside in different houses. Several domestic activities such as cooking, washing and use of vehicles activities will thus accompany residence. In addition, there will be production of domestic and sanitary wastes.

### **3.11.2. Solid Waste**

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 at the designated dumping site. The solid wastes will be assembled in the garbage collection point ready for disposal by a NEMA licensed waste disposal company. Private waste disposal companies that are approved by NEMA and County Government will be responsible for solid waste disposal.

### **3.11.3. Waste Water and storm water Management**

Sewage generated from each unit will be discharged into the existing sewer lines and then to the NCC mains sewer line available on the site/area. Storm water will be properly channeled to improve drainage within the development.

### **3.11.4. Cleaning**

The proponent will be responsible for regular washing and cleaning of the pavements and communal areas. Individual tenants will be responsible for washing and cleaning their own premises/ residences. Cleaning operations will involve the use of substantial amounts of water, disinfectants and detergents.

### **3.11.5. General Repairs and Maintenance**

The houses and associated facilities 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 refrigeration equipment, repairs of leaking water pipes, painting and replacement of worn out materials among others.

## ***3.12. Description of the Project's Decommissioning Activities***

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

- All the equipment should be removed from the site
- Fence and put signpost of unsafe areas until natural stabilization occurs
- Backfill surface openings if practical

### **3.12.1. Dismantling of Equipment and Fixtures**

All equipment including electrical installations, furniture partitions, pipe-work and sinks among others will be dismantled and removed from the site on decommissioning of the project. Priority will be given to reuse of this equipment in other projects. This will be achieved through resale of the equipment to other building owners or contractors or donation of this equipment to schools, churches and charitable institutions.

### **3.12.2. Site Restoration**

Once all the waste resulting from demolition and dismantling works is removed from the site, the site will be restored through replenishment of the topsoil and re-vegetation using indigenous plant species.

### ***3.13. Building Materials and Energy Used***

Several building materials will be required for construction of the Houses and associated facilities. These will include sand, ballast, hard core, timber, cement, clay tiles, metal sheets, electrical gadgets, and steel, plumbing materials, glass and paints among others. Most of these materials will be obtained locally as well as surrounding areas. The main sources of energy that will be required for construction of the project will include mains electricity and fossil fuels (especially diesel). Electricity will be used for welding, metal cutting/grinding and provision of light. Diesel will run material transport vehicles and building equipment/machinery such as bulldozers and concrete mixers. The proponent intends to promote efficient use of building materials and energy through proper planning to reduce economic and environmental costs of construction activities.

### ***3.14. Solid Waste Generated***

Large amounts of solid waste will be generated during construction of the project. These will include metal cuttings, rejected materials, surplus materials, surplus oil, excavated materials, paper bags, empty cartons, empty paint and solvent containers, broken glass among others. The proponent will take steps to minimize the generation of such waste and to ensure proper disposal

procedures. A lot of domestic waste such as waste from foodstuffs, empty plastic containers, cartons, etc. will be generated during the operational phase of the project. The proponent will be responsible for waste management within the Housing Project and will put in place measures such as provision of waste handling facilities and ensuring prompt and regular waste disposal. On decommissioning, large quantities of solid waste will be generated from demolition works and equipment dismantling. The proponent will provide measures for recycling, reuse or disposal of such wastes.

During operation the proposed development will generate about 40.0 Kilograms daily of domestic solid waste from the overall development whereby each client/user(s) generates about 0.3 to 0.4 Kg per person daily. Therefore, the proponent will ensure provision of adequate on-site solid waste receptacles in the proposed designs approved by the NCCG & the same will be incorporated in the construction of the proposals and its ancillary facilities. Thereafter, the proponent will ensure that tenants will be responsible for maintaining a clean environment within their respective premises. Besides, the proponent is advised to implement the 4Rs solid waste management principle of separation at source/household/generator & undertake waste Recovery, Reduction, Re-use & Recycling [4Rs] prior to its collection & disposal at the final disposal site reduce approved by the NCCG. The foregoing sustainable waste management principles ensure that the recoverable, reduceable, recyclable and/or reusable solid waste materials are retrieved for use or recycling/re-used prior to final disposal of the residual solid waste that has no usefulness and is disposed of into the provided well protected waste receptacles.

## **CHAPTER 4: LEGAL AND REGULATORY FRAMEWORK**

Environmental Impact Assessment (EIA) is a procedure that identifies, describes, evaluates, and develops means of mitigating potential impacts of a proposed activity on the environment. It is a tool for ensuring that new projects and programmes are in harmony and co-existence with other social-economic and environmental activities in their neighbourhood. EIA incorporates appropriate mitigation measures to avert adverse impacts of a project, thereby protecting the well being of the environment and the people. There are a number of policy, legal provisions and regulatory frameworks that the proposed development will have to consider in order for the development to be in full compliance with their guidelines and requirements. These are discussed in the sections below.

### **4.1 Policy Framework**

#### **4.1.1 The National Environmental Action Plan (NEAP)**

The NEAP was a deliberate policy effort to integrate environmental considerations into the country's economic and social development. The integration process was to be achieved through a multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and conservation of natural resources are an integral part of societal decision making. The project shall be implemented and operated based on these guidelines

#### **4.1.2 Environment and development policy**

The aim of this policy is to harmonize environmental and development goals so as to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development. Sound measures have been put in the design of the project so that its implementation does not negatively affect the environment and the neighbors.

#### **4.1.3 National Shelter Strategy to the Year 2000**

Kenya adopted this strategy following the International Year of Shelter for the Homeless in 1987. This advocates for the involvement of various actors to come in and assist the government in providing housing. This took cognizance of the governments' inability to provide sufficient shelter for all its citizens. The government was to simply facilitate other actors such as developers to invest in shelter.

## **4.2 Legal and Legislative Framework**

### **4.2.1 Environmental Management and Coordination (Amendment) Act, 2015**

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 1999 provide a legal and institutional framework for the management of the environmental related matters. This EIA project study report has been written pursuant to section 58 (1) of this Act.

### **4.2.2 The Water Act, 2002**

This Act regulates the use, 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.

- i) The ministry of water is vested with the duty to conserve and regulate the use of natural water resources (estuaries, surface, ground water and marine). The Act prohibits the release of waste water without a permit and also spells out penalties for pollution of water. The Ministry through the district water board regulates the use of water and the drilling of boreholes.
- ii) It is in accordance with this Act that this EIA project report has come up with necessary mitigation measures to ensure that there is no wastage and pollution of existing water sources.

#### **4.2.3 Public Health Act (Cap 242)**

The public health Act regulates activities detrimental to human health. The owner(s) of the premises is responsible for environmental nuisances such as noise and emissions, at levels that can affect human. Section 115 of this Act state that no person or institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that Local Authorities take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to be injurious or dangerous to health. Such nuisance or conditions are defined under section 118 as waste pipes, sewers, drains or refuse pits in such state, situated or constructed as in the opinion of the medical officer of health to be offensive or injurious to health.

- Part 9 of the Act deals with sanitation and sanitation and housing, and it's of most significance for the control of polluting discharges.
- It is in accordance with Act that this report has come up with an Environmental Management Plan (EMP) to ensure safety of workers, Neighbors and passersby.

#### **4.2.4 Physical and Land Use Planning Act (2019)**

The County government is empowered by the Act to reserve and maintain all the land planned for open spaces, parks, urban forests and greenbelts in accordance with the approved physical development plan. The Act further states that, no licensing Authority shall grant, under any written law a license for commercial or industrial or occupation of any building or in respect to any premises or land, for which no development permission has been granted by the respective local authority.

#### **4.2.5 Building Code 2000**

This by-law recognizes the County Governments as the leading planning agencies. It compels the potential developer to submit development application for the approval. The County Governments are hence empowered to approve or disapprove any plans if they do or don't comply with the law respectively.

Any developer who intends to erect a building as herein proposed must give the respective local authority a notice of inspection before the erection of the structure. On completion of the structure,

a notice of completion shall be issued by the local authority to facilitate final inspection and approval. No person therefore shall occupy a building whose certificate of completion has not been issued by the County Government.

Section 214 of the by law requires that any public building where the floor is more than 20 feet above the ground level should be provided with firefighting equipment that may include one or more of the following hydrants, hose reels and fire appliances, external conations portable fire appliances, water storage tanks, dry risers, sprinkler, drencher and water spray spring protector system.

Finally section 196 provides that the County Government may refuse to admit to sewer any trade waste or any other effluent unless it has been treated in an approved manner. In this regard, the County Government may cause the occupier of the premise to construct an approved manhole connected to the pipe conveying such effluent.

In accordance with this Act, building plans for the proposed project have been approved by the Nairobi City County Government.

#### **4.2.6 The County Government Act (Cap 265)**

This is the principal Act providing for the management and powers of County Governments. In matters planning, the Act gives power to County Governments, to prohibit and control the development and use of land in the interest of proper and orderly development of the areas of their jurisdiction.

Section 109 helps counties to ensure effective co-ordination of spatial developments. Subsection (2) part c states in part; a county spatial plan shall;

- Indicate desired patterns of land use within the county;
- Address the spatial construction or reconstruction of the county;
- Provide strategic guidance in respect of the location and nature of development within the county;



- Set out the basic guidelines for land use management system in the county taking into account any guidelines, regulations or laws as provided for under Article 67(2) of the Constitution;
- Set out a capital investment framework for the county's development programs;
- Contain a strategic assessment of the environmental impact of the spatial development framework;

According to section 173, any person who without prior consent in writing from the County, erects a building on; excavate or opens-up; or injures or destroys a sewers, rains or pipes shall be guilty of an offence. Any demolitions and repairs thereof shall be carried out at the expense of the offender.

The Act, by virtue of section 176 also empowers the local authority to regulate sewerage and drainage, fix charges for use of sewers and drains and ensure that connecting premises meets the related costs.

#### **4.2.7 Occupational Safety and Health Act No.15, 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 as discussed in the following sections.

##### **a) Health**

Under health, there should be provision of suitable protective clothing and appliances including where necessary, suitable gloves, footwear, goggles, gas masks, and head covering, and maintained for the use of workers in any process involving expose to wet or to any injurious or offensive substances

##### **b) Safety**

Special precaution against gassing is laid down for work in confined spaces where persons are liable to be overcome by dangerous fumes. Air receivers and fittings must be of sound construction and properly maintained.

### **c) Welfare**

Section 55 provides for the development and maintenance of an effective Programme of collection, compilation and analysis of occupational safety. This will ensure that health statistics, which shall cover injuries and illnesses including disabling during working hours, are adhered. This EIA report outlines clearly measures that will protect health, safety and welfare of employees on site.

#### **4.2.8 Land Registration Act, 2012**

An Act of Parliament to make provision for the removal of doubts that may arise regarding ownership of land. According to section 12 of this Act, the Recorder of Titles shall have and use a seal of office bearing the impression of the Kenya Coat of Arms, and having inscribed thereon in the margin "Recorder of Titles, Kenya", and the imprint of the seal shall be valid whether made in wax, ink or other substances.

Section 13 of the Act state that; “All documents purporting to be issued or written by or under the directions of the Recorder of Titles and purporting to be sealed with his seal of office, or signed by him or by one of his deputies, shall be received in evidence, and shall be deemed to be issued or written by or under the direction of the Recorder of Titles without further proof, unless the contrary is shown”.

Section 27 further provides that every certificate of title shall set out a description of the immovable property therein referred to, with figures and references necessary to identify it on the plan or map of the area in which it is situated.

#### **4.2.9 Land Titles Act (Cap282)**

According to section 23 (1) of this Act, the certificate of title issued by the registrar to a purchaser of land upon a transfer or transmission by the proprietor thereof shall be taken by all courts as conclusive evidence that the person named therein as proprietor of the land is the absolute and indefeasible owner thereof, subject to the encumbrances, easements, restrictions and conditions contained therein or endorsed thereon, and the title of that proprietor shall not be subject to

challenge, except on the ground of fraud or misrepresentation to which he is proved to be a party. *A copy of land ownership documents is attached to this EIA Project Report.*

### **4.3 Institutional Framework**

#### **4.3.1 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. The Authority shall among others:

- Co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plans, programmes and projects with a view to ensuring the proper management and rational utilization of the natural resources environment on a sustainable yield basis for the improvement of the quality of human life in Kenya.
- Take stock of the natural resources in Kenya and their utilization and consultation, with the relevant lead agencies, and develop land use guidelines.
- Examine land use patterns to determine their impact on the quality and quantity of the natural resources among others.

#### **4.3.2 County Environment Committee**

County Environment Committees are responsible for the proper management of the environment within the County in respect of which they are appointed to. They are also to perform such additional functions as are prescribed by the Act or as may, from time to time be assigned by the Minister by gazette notice. The decisions of these committees are legal and it is an offence not to implement them.

#### **4.3.3 Public Complaints Committee**

The Committee is charged with the following functions: Investigating allegations/ complaints against any person or against the Authority (NEMA) in relation to the condition of the environment and its management, Prepare and submit to the County periodic reports of its activities which shall

form part of the annual report on the state of the environment, and to perform such other functions and exercise such powers as may be assigned to it by the County

#### **4.3.4 National Environmental Tribunal**

This tribunal guides the handling of court cases related to environmental offences in the Republic of Kenya. The Tribunal hears appeals against the decisions of the Authority. Any person who feels aggrieved may challenge the tribunal in the High Court.

## **CHAPTER 5: PUBLIC CONSULTATION**

### *5.1. Introduction*

The Consultation and Public Participation Process is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated by EMCA 1999 section 58 on EIA for the purpose of achieving the fundamental principles of sustainable development. Views from the local residents, stakeholders and development partners who in one way or another would be affected or rather interested in the proposed project were sought through administering of questionnaires, print media Radio adverts and public meetings as stipulated the Environment Management and Coordination Act, 1999.

### *5.2 Objectives of the Public Participation*

The objectives of the Public participation exercise were to:

1. Disseminate and inform the stakeholders about the project with special reference to its key components and location.
2. Create awareness among the public on the need for the EIA for the proposed project.
3. Gather comments, suggestions and concerns of the interested and affected parties.
4. Incorporate the information collected in the EIA study.

This process involved mapping of the key stakeholders. Stakeholder mapping is the process of identifying and categorizing key stakeholders. The following stakeholders were identified

#### **a. Nairobi City County- Physical Planning Department**

They play key role in ensuring compatibility of land uses ie the proposed project and the neighborhood character. They will also issue change of user approval, architectural and structural drawings approval

#### **b. National Construction Authority**

This is the body that is oversees all construction works and therefore they are key stakeholders during construction phase

**c. National Environment Management Authority**

NEMA is responsible for issuing license before construction

**d. Parklands and Ngara Local Residents**

These are the immediate neighbors who are likely to be affected by the proposed project.

**e. General Public**

The general members of the public will be notified about the proposed project through print media and radio advert.

Parklands and Ngara local residents were consulted and the were requested to fill in some structured questionnaires while having a discussion about the proposed mixed apartment. A total of 30 local residents filled the questionnaires during this exercise which involved questionnaire administration as well as oral interviews. This consultation process dealt more with the project's anticipated impacts on the local environment.

Most of the local residents who were interviewed did not anticipate any negative impacts of the proposed project on the area environment, health and safety. The consultants informed them that mitigation measures will be put in place during construction to ensure minimization of any possible impact of the project on the environment. All of the local residents who were interviewed welcomed the project.

**5.3. Comments Raised by the respondents**

**5.3.1. Increased number of housing units**

Adequate housing is one of the major challenges experienced by most city residents resulting to development of several informal settlements that are seen within the city. With the development of the proposed development, the proponents shall contribute towards trying to solve the problem.

**5.3.2. Employment opportunities**

Most of the respondents indicated that within the proposed project site, several young people from the local area shall benefit positively through the jobs that shall be created once construction activities begin on site. The proponents shall require various professionals but specifically masons

and construction labourers who shall benefit directly from the project. The respondents however suggested that the proponents consider sourcing for labour force locally before seeking elsewhere.

### **5.3.3. Opening up the place to other investors**

Within the proposed project area there are several plots that have not been developed yet and the respondents indicated that with construction of such a modern residential village, several other absentee landowners may consider developing their properties hence improving the value of the project area. With the ever increasing value for land in the area, the land owners may also opt to sell their land to other serious investors who are more than willing to put up ventures in the area creating employment opportunities and business ventures hence improved living standards of the people in the area.

### **5.3.4. Increased Market/business opportunities**

Throughout the construction period, the proposed project shall provide a sustained market for the supply of various building materials by local businessmen and women from the area such as ballast, sand, building blocks, cement and steel metals among others. Most respondents were of the opinion that the proponents/contractor considers sourcing construction materials locally before sourcing them from other areas. This is to help improve local businesses first before promoting other areas.

### **5.3.5. Air pollution**

Some respondents expressed concern over the possibility of generation of large amount of dust from the construction activities which shall negatively impact on the local environment. The proponents were requested to keep dust levels within the required limits and be mindful of the neighbourhood through sprinkling of water along the access road, construction of a hoarding and provision of dust nets to prevent the spread of dust to neighbouring homesteads.

### **5.3.6. Noise pollution**

There was concern over the possibility high noise levels in the project site as a result of excavation and construction works. The sources of noise pollution will include transport vehicles, construction machinery, construction workers and metal grinding and cutting equipment among other sources. The respondents suggested that all construction activities must be limited to between 8am and 5pm during weekdays and 8am and 3pm during Saturdays. Some suggested that no construction

activities should be carried out on site on Sundays and during any public holidays. Plastering if any that may required on site especially during ground preparation stage must be communicated to the neighbours in advance.

#### **5.3.7. Waste generation and disposal**

Some of the respondents were concerned on the unsightly scenarios associated with construction sites where solid waste is usually scattered all over the project area e.g. empty cement bags, rejected metals, wrappings, glass among others affecting negatively the scenic beauty of various project areas. Suggestions were made to the proponents to manage all the waste resulting from the project in an environmentally accepted manner to ensure that no wastes spills over to the neighbourhood

The respondents were also concerned in the manner in which the proponents shall be disposing off excavated soils from the ground preparation stage considering the location and condition of the proposed site. They suggested that the proponents/contractor must consider disposing off the excavated soils in a more environmentally friendly way to avoid inconveniencing other residents.

#### **5.3.8. Increased population in the project area**

As a result of the project taking place, there shall be automatic increase in the number of people visiting the project area especially during construction and operational phases. With the increase in the number of people in a particular area comes with different vices as well as increased pressure on the available infrastructural facilities. The respondents urged the proponents through contractor to ensure workers onsite uphold integrity and decent behavior at all times within and without the site.



## CHAPTER 6: ANALYSIS OF PROJECT ALTERNATIVES

### 6.1. *Overview*

A thorough assessment shows that the negative impacts likely to be caused by the project can be mitigated successfully. Various alternatives of the proposed development are appraised in the sections below.

### 6.2. *No project alternative*

Without the proposed development, the subject plot would remain in its current underutilized state. Advantage associated with this are that there would be no negative implications on the environment brought about by implementing the project.

However, the disadvantages of a “no project alternative” outweigh the advantages. This are;

- a) The proponent would be at loss financially since they have already invested a lot of resources in terms of professional
- b) The professional’s firms engaged in the project would lose out on potential revenue.
- c) The proponent would lose out on the opportunity to invest and increase his income.
- d) Potential job opportunities would be missed.
- e) The government would lose out on taxes and the opportunity to encourage investment in the private sector.
- f) The value of land would remain underutilized.

### 6.3. *Relocation alternative*

The other option available for the project implementation is for the proponent to relocate it to an alternative site. At the moment, the proponent does not have an alternative site. This implies that they have to buy another piece of land elsewhere. Looking for land of the similar size and market location and completing official transactions might take over one year, with no guarantee that the land would be available, and if such land is available, its cost might be beyond affordable for the proponent. The proponents will spend another six months to one year on design and approvals/licensing since design and planning has to be according to site conditions. Project design

and planning before the stage of implementation will cost the proponents additional millions of shillings besides what they have already spent.

Assuming the project will be given a positive response by all the relevant authorities at the new alternative site, this project would have been delayed for about two or three years before implementation. This is a delay that both the proponents and the Kenya economy can't 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/local investors especially in the housing sector that has been shunned by many public and private investors.

In consideration of the above concerns and assessment of the current proposed site, relocation of the project is not a viable option.

#### **6.4. *Alternative land uses***

Alternative land uses such as; agricultural or recreational may be considered for the site. However, the project proponent has settled on this project because of the anticipated high net return and also due to high demand of affordable residential units in the area. Furthermore, proposed development will best meet the needs of the proponent.

#### **6.5. *Technology & Procedures***

The project team comprising of various consultants and professionals will make use of recommended technology in the design, construction and operation phases of the project. The team will ensure that the project complies with all stipulated specifications and standards. The procedures used will ensure that the project conforms to the principle of best practice. The building will be designed in a way to ensure comfort within existing climatic conditions and to ensure no need of air conditioning which is expensive to run and maintain.

#### **6.6. *Alternative Design***

The design that was selected proved to be the most feasible. It provides sufficient space requirements and facilities to meet the objectives of the project. The design also ensures compatibility of the new building with the existing buildings in the vicinity. The proponent settled on this design as a unique design that best meets the objectives of the project.

**6.7. *Alternative Materials and Inputs***

The choice of materials and inputs selected for the project was based on the stipulated laws, standards and specifications as commonly applied in a project of such nature.

**6.8. *Scale and Extent***

The scale and extent of the project will ensure maximum utility of land as well as satisfaction of the project objectives. The chosen scale and extent is the most feasible given the context and operational time frame of the project.

## **CHAPTER 7: ENVIROMENTAL IMPACTS FOR THE PROPOSED PROJECT**

### ***7.1 Introduction***

This Section identifies and discusses both positive and negative impacts associated with the proposed project. The potential impacts from the proposed project area are identified and assessed based on the nature, magnitude and merits/or demerits of the various activities associated with the project.

This Chapter therefore describes the anticipated positive and negative impacts of the proposed project due to project location and during construction, operation and decommissioning phases.

### ***7.2 Positive impacts during Construction phase***

#### **7.2.1 Employment Creation**

During the construction phase, several employment opportunities will be created not only for construction workers but also for those providing professional works and consultancy services. This will in turn ease on the burden of unemployment in the country.

#### **7.2.2 Aesthetic value**

The proposed development will enhance the site aesthetic value. The designs of the proposed facilities will ensure visual attractiveness which will thus add beauty to the site. The proponent has put in place, elaborate mechanism to improve the landscape of the area after construction.

#### **7.2.3 Increase in the number of residential units**

Once construction of the proposed project is complete, the proponents shall have added a total of 205 units to the county/country's housing stock. All the proposed units shall be constructed using modern construction technology which shall allow construction of modern facilities.

#### **7.2.4 Creation of business opportunities**

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

#### **7.2.5 Improved land utilization**

Land is a scarce resource in Kenya and through construction of the proposed project will ensure optimal use of land to the great benefit of the country and its people. Development of the under-utilized land for housing that complements economic activities hence improving the economy. The proposed project shall fully utilize the idle land and positively gain from the land.

### **7.2.6 Market for Building Materials**

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

## ***7.3 Negative impacts during Construction phase***

### **7.3.1 Noise Pollution**

This impact is anticipated due to the use of common construction machinery during the implementation of the project. Exposure to high noise levels above 85 db can affect project workers, residents, passers-by and among other persons within the vicinity of the project site. Regardless, all construction activity will be carried out during the day and sound attenuated equipment will be used.

### **7.3.2 Air Pollution**

Potential impacts on the air quality during the construction stage will be due to the dust and the exhaust gases generated in and around the construction site. Sources of air pollution will include vehicles entering the site to deliver building materials and the machinery used for construction generate hazardous exhaust fumes such as Carbon Oxides (CO<sub>x</sub>), Sulphur Oxides (SO<sub>x</sub>) and Nitrogen Oxides (NO<sub>x</sub>). Dust particles are caused by excavation works, vibration of machinery and movement of vehicles. Such dust and gases have direct negative impact to the quality of air hence animal/human health.

### **7.3.3 Sanitation and Health Hazards**

There is likely to be littering during loading of refuse and uncontrolled human waste from workers on site. This can affect human and animal health, and will be appropriately mitigated.

### **7.3.4 Accidents and Safety Risks**

On any construction site, the risk of accidents and other related safety concerns is high. This danger is posed to the workers on site as well as the adjacent residents and passers-by. Thus, there is need to put in place measures to protect them against falling.

### **7.3.5 Visual Intrusion**

During construction, the main visual impacts would occur during earthworks for the foundation of the building. This impact would be generally be confined to the site.

### **7.3.6 Soil Disruption**

Since the proposed project development involves digging up of trenches (earthwork) for laying out the foundation and hard landscaping, this is likely to disrupt the soil compaction and layout leading to poor water infiltration and seepage. It might also lead to poor drainage.

### **7.3.7 Water Use**

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

## ***7.4 Positive Environmental impacts during Operational Phase***

### **7.4.1 Provision of Housing Facilities**

The project will provide modern houses with new and state of the art infrastructure to residents of Nairobi County. The impact will be significant in easing shortages of houses in and around the neighboring County.

### **7.4.2 Employment Opportunities**

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

### **7.4.3 Revenue to National and County Governments**

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

### **7.4.4 Improved Security**

Security will be ensured around the Houses through distribution of suitable security lights and presence of 24-hour security guards. Additionally, CCTV cameras shall be used in monitoring security.

## ***7.5 Negative Environmental Impacts during Operational Phase***

### **7.5.1 Solid Waste Generation**

The project is expected to generate enormous amounts of solid waste during its operation phase. The bulk of the solid waste generated during the operation of the project will consist of paper, plastic, glass, metal, textile and organic wastes. Such wastes can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on animal and human health.

### **7.5.2 Energy Consumption**

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

### **7.5.3 Pressure on Existing Facilities**

The proposed development is also likely to increase pressure on existing infrastructure such as roads and water supply.

## ***7.6 Positive Impacts during decommissioning phase***

### **7.6.1 Rehabilitation**

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

### **7.6.2 Employment Opportunities**

Several employment opportunities will be created for demolition and construction staff

## ***7.7 Negative Impacts during decommissioning phase***

### **7.7.1 Solid Waste**

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

### **7.7.2 Noise and Vibration**

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



## **CHAPTER 8: IMPACT MITIGATION MEASURES**

### ***8.1 Introduction***

This chapter highlights the necessary mitigation measures that will be adopted to prevent or minimize significant negative environmental, health and safety impacts associated with the activities of the project during its construction, operation and decommissioning phases.

### ***8.2 MITIGATION OF CONSTRUCTION PHASE IMPACTS***

#### **8.2.1 Minimization of Noise and Vibration**

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

#### **8.2.3 Reduction of Dust and Emissions**

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

#### **8.2.4 Minimization of risks of accidents and injuries to workers**

To reduce the construction workers accidents and hazards during the construction phase of the proposed project, the Proponent shall be committed to adherence to the occupational health and safety rules and regulations stipulated in Occupational, Safety and Health Act, 2007. In this regard, the Proponent shall be committed to provision of appropriate personal protective equipment, as well as ensuring a safe and healthy environment for construction workers as outlined in the EMP.

#### **8.2.5 Ensuring Efficient Solid Waste Management**

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

### **8.2.6 Visual Intrusion**

To mitigate visual impacts as a result of earthworks during the laying foundations for the development project, the developer shall be required to restore the site through backfilling, leveling and planting of vegetation. Additionally, all solid waste and debris from the construction site must be cleared on completion. The general scheme should be such that the development blend or rather improve the quality of the surrounding

### **8.2.7 Water Use and Management**

The construction activities will require large quantities of water mainly for concrete mixing, curing, sanitary and washing purposes.

#### ***Potential Mitigation Measures***

- Provide notices and information signs within the project area to notify on the need to conserve water resources.
- Encourage re-use/recycling of water during construction.

### **8.2.8 Efficient sourcing and use of raw materials**

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

## ***8.3 MITIGATION OF OPERATIONAL PHASE IMPACTS***

### **8.3.1 Ensuring Efficient Solid Waste Management**

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

### **8.3.2 Minimization of Sewage Release**

The proponent will ensure that there are adequate means for handling the large quantities of sewage generated by the Houses being directed to the existing sewer line.

### **8.3.3 Ensure Efficient Energy Consumption**

The proponent plans to install an energy-efficient lighting system for the project. This will contribute immensely to energy saving during the operational phase of the project. In addition, occupants of the Houses will be sensitized to ensure energy efficiency in their domestic operations.

### **8.3.4 Ensure Efficient Water Use**

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

## ***8.4 Mitigation of Decommissioning Phase Impacts***

### **8.4.1 Efficient Solid Waste Management**

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

### **8.4.2 Reduction of Dust Concentration**

High levels of dust concentration resulting from demolition or dismantling works will be minimized as described in Section 7.2.3.

### **8.4.3 Minimization of Noise and Vibration**

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

## CHAPTER 9: ENVIRONMENT MANAGEMENT PLAN

### *9.1 Introduction*

The proponent of the proposed project acknowledges the fact that the proposed project activities will have some impacts on safety and socio-economic environment. The main focus therefore will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a program, which overtime will need continuously improvement.

An environmental management/monitoring plan has been developed to assist the proponent in mitigating and managing environmental impacts associated with the life cycle of the project. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the EMP. As such, the EMP will be subject to a regular review.

The table below provides the Environmental Management Plan (EMP) for the construction, operational and decommissioning phases of the proposed project. In general, the table outline potential safety, health and environmental risks associated with the proposed intervention and at the same time details all the necessary mitigation measures, their financial costs, as well as the persons responsible for their implementation and monitoring.

Table 1 Environmental Management and Monitoring Plan during construction phase

<b>Environmental/ Social Impact</b>	<b>Proposed Mitigation Measures</b>	<b>Actors</b>	<b>Monitoring Frequency</b>	<b>Estimated Cost (KShS)</b>
<b>Site clearance</b>	<ul style="list-style-type: none"> <li>• Ensure proper demarcation and delineation of the project area to be affected by construction works</li> </ul>	Proponent Contractor Engineer Architect Workers	Routine inspection	150, 000
<b>Soil Erosion</b>	<ul style="list-style-type: none"> <li>• Ensure management of excavation activities</li> <li>• Control activities especially during rainy seasons</li> <li>• Provide soil erosion control and conservation structures where necessary.</li> <li>• Compact loose soils to minimize wind erosion</li> </ul>	Proponent Contractor NEMA Inspectors Workers	Routine inspection	350, 000
<b>Air Pollution</b>	<ul style="list-style-type: none"> <li>• Dust suppression with water-sprays during the construction phase on dusty areas</li> <li>• Careful screening of construction site to contain and arrest construction-related dust.</li> <li>• Exposed stockpiles of e.g. sand, will be enclosed, covered, and watered daily.</li> </ul>	Proponent  Contractor  County Public Health Officer	Daily inspection Routine maintenance	300,000

	<ul style="list-style-type: none"> <li>• Ensure construction machinery and equipment are well maintained to reduce exhaust gas emission</li> <li>• All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction.</li> <li>• Drivers of construction including bulldozers, earth-movers etc. will be under strict instructions to minimize unnecessary trips and minimize idling of engines.</li> </ul>	<p>Workers</p> <p>NEMA Inspectors</p>		
<b>Noise Pollution</b>	<ul style="list-style-type: none"> <li>• Construction activities to be restricted to daytime i.e. 8am to 5pm</li> <li>• Use of Suppressors on noisy equipment or noise shields for instance corrugated iron sheet structures</li> <li>• Sensitize drivers of construction machinery on effects of noise</li> <li>• Trucks used at construction site shall be routed away from noise sensitive areas where feasible.</li> </ul>	<p>Proponent</p> <p>Contractor</p> <p>County Public Health Officer</p> <p>Workers</p>	<p>Random inspection</p> <p>Routine maintenance</p>	100, 000

	<ul style="list-style-type: none"> <li>• Maintain plant equipment to suppress frictional noise</li> <li>• Workers in the vicinity or involved in high-level noise to wear PPE</li> <li>• Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009</li> </ul>	NEMA Inspectors		
<b>Oil Pollution</b>	<ul style="list-style-type: none"> <li>• Proper storage, handling and disposal of new oil and used oil and related wastes</li> <li>• Maintain construction machinery and equipment to avoid leaks</li> <li>• Maintenance of construction vehicles to be carried out in the contractors yard (off the site)</li> <li>• Provide oil interceptors along the drains leading from car wash and service bays</li> </ul>	Contractor  Worker	Daily inspection  Routine maintenance	50,000
<b>Solid waste and liquid waste</b>	<ul style="list-style-type: none"> <li>• Segregate the waste at the site</li> <li>• Ensure proper disposal of construction waste in the contractor's yard (off the site).</li> <li>• Engage services of a registered NEMA waste handler to dispose the waste at designated disposal sites</li> </ul>	Contractor  Proponent  Workers	Weekly Checks	250,000



	<ul style="list-style-type: none"> <li>• During transportation of building materials and waste, trucks should be covered to prevent them from falling along the roads</li> <li>• Sensitize workers on the reuse of materials where appropriate.</li> <li>• As provided for by the Building Code, a portable toilet will be provided on site to be used by construction workers</li> </ul>			
<b>Increased water demand</b>	<ul style="list-style-type: none"> <li>• Drill a borehole (all necessary approvals from WRMA and NEMA have been sought and granted)</li> <li>• Employ services of waters vendors to supplement water supply</li> <li>• Sensitize workers to reduce water wastage</li> </ul>	<p>Contractor</p> <p>Proponent</p> <p>WRMA</p> <p>Workers</p>	Daily Inspection	300,000

<p><b>Health and safety of workers</b></p>	<ul style="list-style-type: none"> <li>• All workers will be sensitized before construction begins, on how to control accidents related to construction.</li> <li>• A comprehensive contingency plan will be prepared before construction begins, on accident response.</li> <li>• Keep record of the public emergency service telephone numbers including: Police, Fire brigade, Ambulance</li> <li>• Adherence to safety procedures will be enforced.</li> <li>• Provide first aid kits at strategic places in the site</li> <li>• All workers to wear protective gear during construction e.g. helmets.</li> <li>• Provide clean water and food to the workers.</li> <li>• Construction work will be limited to daytime only</li> <li>• Workers to be adequately insured against accidents.</li> </ul>	<p>Contractor</p> <p>County Public Health Officer</p> <p>Workers</p> <p>Proponent</p> <p>NEMA Inspectors</p>	<p>Random Checks</p>	<p>100,000</p>
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<b>Insecurity</b>	<ul style="list-style-type: none"> <li>• Provide security guards during construction period for both day and night</li> <li>• Construct temporary barrier (iron sheet) around the site before commencement of construction</li> <li>• Keep records of all movement in and out of the construction site.</li> <li>• Strategic installation of lighting as well as security alarms and backup systems</li> </ul>	Contractor  Proponent	Daily Observation	100,000
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*Table 2 Environmental Management and Monitoring Plan during Operational phase*

<b>Environmental/ Social Impact</b>	<b>Proposed Mitigation Measures</b>	<b>Actor</b>	<b>Monitoring Frequency</b>	<b>Estimated Cost (KShS)</b>
<b>Solid waste generation</b>	<ul style="list-style-type: none"> <li>• Ensure that wastes generated are efficiently managed through recycling, reuse and proper disposal procedures</li> <li>• Encourage segregation of waste (organic and inorganic) and provide for</li> </ul>	Proponent Estate Managers Occupants County Public Health Officer	Periodic Checks	150,000

	<p>clearly marked dustbins to serve the specified use.</p> <ul style="list-style-type: none"> <li>• A private NEMA licensed company to be contracted to handle solid waste</li> </ul>			
<b>Liquid Waste Generation and Management</b>	<ul style="list-style-type: none"> <li>• Regular inspection and maintenance of the waste disposal systems during the operation phase</li> <li>• Connection to Sewer system/septic tank</li> </ul>	<p>Proponent Estate Managers Occupants County Public Health Officer</p>	<p>Periodic Checks</p>	<p>800,000</p>
<b>Air pollution</b>	<ul style="list-style-type: none"> <li>• Cabro-paving on exposed areas</li> <li>• Gardening of landscaped areas</li> <li>• Watering of uncovered area</li> </ul>	<p>Proponent NEMA Inspectors</p>	<p>Weekly checks Routine Maintenance</p>	<p>250 000</p>
<b>Noise and vibration Pollution</b>	<ul style="list-style-type: none"> <li>• Do annual noise measurements.</li> <li>• Sensitize residents on minimal permissible noise levels</li> <li>• Comply with L.N. 25:Noise prevention and control rules, 2005 and L.N. 61:</li> </ul>	<p>Proponent  Workers NEMA Inspectors Occupants</p>	<p>Periodic Checks</p>	<p>200 000</p>

	Noise and vibration pollution regulation, 2009			
<b>Storm Water impacts</b>	<ul style="list-style-type: none"> <li>• Proper maintenance of drainage structures</li> <li>• Inspection and maintenance of water harvesting gutters and storage tanks</li> </ul>	Proponent	Routine inspection and maintenance	700,000
<b>Increased water use</b>	<ul style="list-style-type: none"> <li>• Harvest rain-water</li> <li>• Install water conserving taps that turn off automatically when not in use</li> <li>• Educate residents on optimal water use</li> </ul>	Proponent Estate Managers Occupants	Daily Inspection  Routine maintenance	150,000
<b>Increased energy use</b>	<ul style="list-style-type: none"> <li>• Switch off electrical appliances when not in use.</li> <li>• Switch off all lights immediately when not in use or are not needed.</li> <li>• Use energy conserving bulbs e.g. LED bulbs for general lighting.</li> <li>• Maintenance of electrical components.</li> </ul>	Proponent  Occupants	Routine Inspection	100,000
<b>Insecurity</b>	<ul style="list-style-type: none"> <li>• Engage services of security guards</li> <li>• Install CCTV cameras</li> <li>• Place hotline numbers on strategic places</li> </ul>	Proponent	Periodic and surprise checks	350,000

	<ul style="list-style-type: none"><li>• Sensitize residents on security precautions</li></ul>			
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**Table 3 Environmental Management and Monitoring Plan during Decommissioning phase**

<b>Environmental/ Social Impact</b>	<b>Proposed Mitigation Measures</b>	<b>Actor</b>	<b>Monitoring Means</b>	<b>Recommended frequency of monitoring</b>	<b>Estimated Cost (KShS)</b>
<b>Demolition of existing structures</b>	<ul style="list-style-type: none"> <li>▪ Apply for demolition permit from relevant authorities before commencing the demolition</li> <li>▪ Engage a registered private contractor to carry out the demolition</li> <li>▪ Provide workers with Personal Protective Equipment (PPEs)</li> <li>▪ The demolition exercise to be limited at day time only</li> <li>▪ Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009</li> </ul>	Project proponent  Contractor  NEMA inspectors	Inspection	Daily during the demolition process	<b>900,000</b>
<b>Solid and Liquid waste</b>	<ul style="list-style-type: none"> <li>▪ Ensure proper solid waste disposal and collection facilities</li> <li>▪ Refuse collection vehicles will be covered to prevent scatter of wastes by wind.</li> </ul>	Contractor  Proponent NEMA inspectors	Routine Activities checks	Daily	550,000

	<ul style="list-style-type: none"> <li>▪ Demolition wastes to be collected by a licensed operator to avoid illegal final dumping at unauthorized sites.</li> <li>▪ All persons involved in refuse collection shall be in full protective attire</li> </ul>	Registered/licensed waste management company			
<b>Air pollution</b>	<ul style="list-style-type: none"> <li>▪ Dust suppression with water sprays on dusty areas.</li> <li>▪ Careful screening of construction site to contain and arrest construction related dust</li> <li>▪ Ensure demolition machinery and equipment are well maintained to reduce exhaust gas emission</li> </ul>	Proponent Contractor NEMA Inspectors	Inspections Routine Maintenance	Daily	600 000
<b>Noise Pollution</b>	<ul style="list-style-type: none"> <li>▪ Demolition activities to be restricted to daytime i.e. 8am to 5pm</li> <li>▪ Use of Suppressors on noisy equipment or use of noise shields for instance corrugated iron sheet structures</li> <li>▪ Workers in the vicinity or involved in high level noise to wear respective safety &amp; protective gear.</li> </ul>	Proponent  Contractor  Workers  NEMA Inspectors	Inspection  Observation  Routine maintenance	Random	800 000



	<ul style="list-style-type: none"> <li>▪ Comply with EMCA (Noise and excessive vibration pollution control) Regulations 2009</li> </ul>				
<b>Health and safety of workers</b>	<ul style="list-style-type: none"> <li>▪ All workers to wear PPEs e.g. helmets</li> <li>▪ All workers will be sensitized before demolition begins, on how to control accidents related to construction.</li> <li>▪ Accordingly, adherence to safety procedures will be enforced.</li> <li>▪ All workers will be adequately insured against accidents.</li> </ul>	<p>Proponent</p> <p>Workers</p> <p>NEMA Inspectors</p>	<p>Activities checks</p>	<p>Daily</p>	<p>450,000</p>
<b>Re-vegetation and comprehensive landscaping</b>	<ul style="list-style-type: none"> <li>▪ Implement an appropriate re-vegetation Programme to restore the site to its original status</li> <li>▪ During the re-vegetation period, appropriate surface water run off controls will be taken to prevent surface erosion;</li> <li>▪ Fencing and signs restricting access will be posted to minimize disturbance to newly-vegetated areas;</li> </ul>	<p>Contractor</p> <p>Proponent</p>	<p>Inspection</p>	<p>Random</p>	<p>550,000</p>

## **CHAPTER 10: ENVIRONMENTAL HEALTH AND SAFETY**

### ***10.1 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 so as to enhance maximum output
- Control of losses and damages to plants, machines, equipment and other products.
- Enhance environmental sustainability through developing sound conservation measures

### ***10.2 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 neighborhood 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 checklist by the contracted engineers in planning and development of the construction of this project.

### ***10.3 Organization and implementation of 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 who shall enforce its provision throughout the life of the project.

### ***10.4 The Guiding Principles to be adopted by the contractor***

- The company will be guided by the following principles: -.

- It will be a conscious organization committed to the promotion and maintenance of high standards of health and safety for its employees, the neighboring 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, neighbors of the project and the environment, with the 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.

#### ***10.5 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, reward and support employees to take personal initiatives and commitment on EHS.

#### ***10.6 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. It shall be incorporated into the contract to perform work. 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 and where applicable as per the EHS management plan for the whole project.
- Responsibilities as it relates to contracting an EHS consultant in liaison with the proponent
- 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

***10.7 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 of work 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 as the work progresses
- A safety harness must be worn before entry into all confined spaces
- An EHS consultant must be posted at the entrance of the project site to monitor progress and safety of the persons working at the construction site.

**(b)The 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 hazards 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

***10.8 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 and conduct current without arcing at the point of contact.
- Ensure that welding clamps are free from any contact with explosive vapors i.e. Oil spillage, Fuel tanks, Coal dusts and miscellaneous combustible material (e.g. Cotton rags filter bags, rubber belting, and wood shavings)
- Ensure that any slag or molten metal arising from welding activities does not start up fires by:
  - ✓ Clearing combustible material to a distance of at least 3 meters away from the working area
  - ✓ Appropriate fire extinguisher is to be kept available for immediate use at all times

### ***10.9 Emergency procedure during construction and operation***

An emergency situation means:

- Unforeseen happening resulting in serious or fatal injury to employed persons or the neighboring communities.
- 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, When emergency is over the EHS coordinator shall notify the workers by putting a message: “ALL CLEAR”

## CHAPTER 11: CONCLUSION AND RECOMMENDATIONS

### *11.1 Conclusions*

From the foregoing analysis, the social and economic rating for the proposed project during occupation/operation is highly positive. Some of these benefits include creation of additional employment, quality shelter, improved businesses in the project area especially for various suppliers, increase in national/local housing stock, increased utility of land and increase in revenue to both the county and national governments among others has outlined in the report. Despite the outlined positive impacts, the proposed development will bring-in some negative impacts such as increased pressure on existing infrastructure (i.e. water, electricity), pollution (to Air, Water, soil) mostly during construction phase.

However, the negative effects on the environment will be mitigated through implementation of design integrated measures outlined in the EMP as well as adhering to all relevant national and international environmental, health and safety standards, policies and regulations that govern establishment and operation of such projects. Additionally, 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.

### *11.2 Recommendations*

Having successfully undertaken the study as documented in this report in accordance to the Environmental (Impact Assessment and Audit) Regulations 2003, it is recommended:

1. That the National Environment Management Authority does consider, approve and grant the required Environmental Impact Assessment License to the proponent of the proposed development.
2. That the Nairobi City County Government and the relevant sectoral agencies support this application for the Environmental impact assessment license in respect to the proposed project.

## REFERENCES

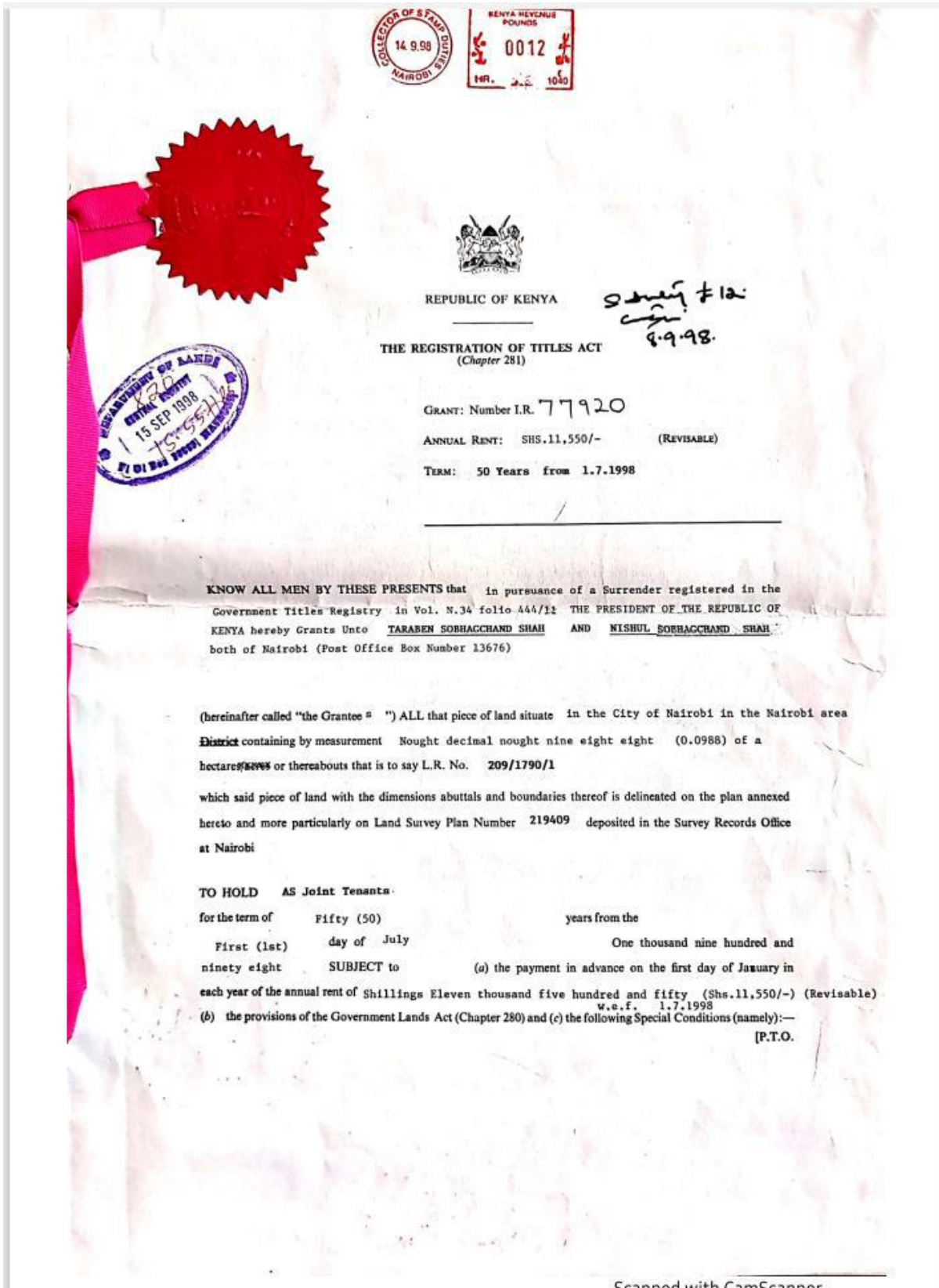
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## **ANNEXES**

1. Copy of ownership documents
2. Change of user Approval
3. Copy of building plans
4. Evidence of Public Participation
5. Experts license

1. Copy Of Ownership Documents



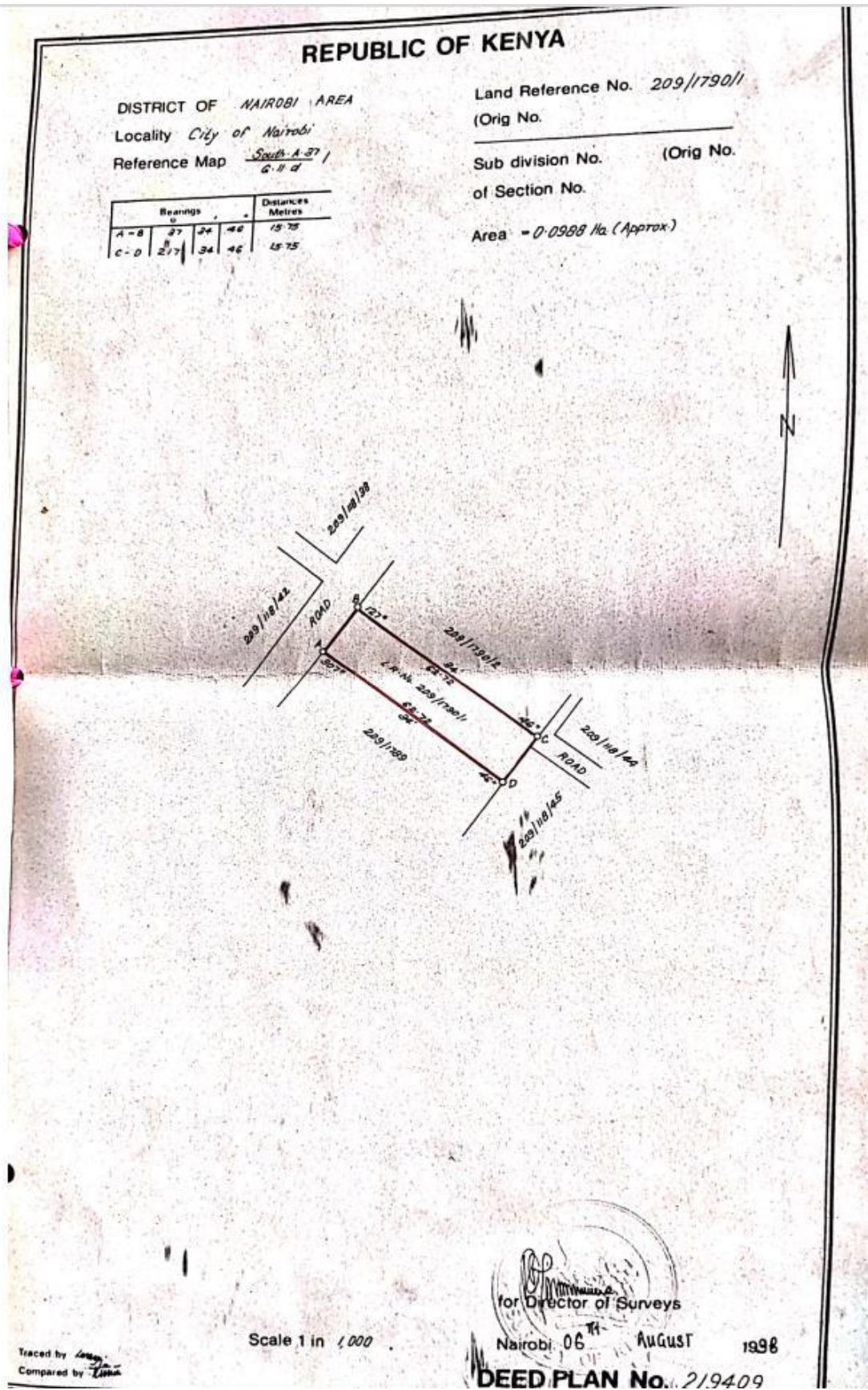
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FORM I ~~XXX~~

### SPECIAL CONDITIONS

1. No further buildings shall be erected on the land nor shall additions or external alterations be made to any buildings otherwise than in conformity with plans and specifications previously approved in writing by the Commissioner of Lands and the Local Authority. The Commissioner shall not give his approval unless he is satisfied that the proposals are such as to develop the land adequately and satisfactorily.
2. The Grantee ~~s~~ shall maintain in good and substantial repair and condition all buildings at any time erected on the land.
3. The land shall be used for residential purposes ~~and not more than one private dwelling house with the necessary fixtures and fittings, or for any other purpose of a residential character, or for any other purpose of the nature of a business or industry.~~
4. The buildings shall not cover more than **fifty** per cent of the land or such lesser area as may be laid down by the Local Authority in its by-laws.
5. The Grantee ~~s~~ shall not subdivide any of the approved subdivisions of the land without the prior consent in writing of the Commissioner of Lands.
6. The Grantees shall not sell transfer sublet charge or part with the possession of the land or any part thereof or any buildings thereon except with the prior consent in writing of the Commissioner of Lands.
7. The Grantee ~~s~~ shall pay to the Commissioner of Lands on demand such sum as the Commissioner may estimate to be the proportionate cost of constructing all roads and drains and sewers serving or adjoining the land and the proportionate cost for the supply of both the water and the electric power to the land and shall on completion of such construction and the ascertainment of the actual proportionate cost either pay (within thirty days of demand) or be refunded the amount by which the actual proportionate cost exceeds or falls short of the amount paid as aforesaid.
8. The Grantee ~~s~~ shall from time to time pay to the Commissioner of Lands on demand such proportion of the cost of maintaining all roads and drains serving or adjoining the land as the Commissioner may assess.
9. Should the Commissioner of Lands at any time require the said roads to be constructed to a higher standard the Grantee ~~s~~ shall pay to the Commissioner on demand such proportion of the cost of such construction as the Commissioner may assess.
10. The Grantee ~~s~~ shall pay such rates taxes charges duties assessments or outgoing of whatever description as may be imposed, charged or assessed by any Government or Local Authority upon the land or the buildings erected thereon including any contribution or other sum paid by the President in lieu thereof.
11. The President or such person or authority as may be appointed for the purpose shall have the right to enter upon the land and lay and have access to water mains service pipes and drains telephone or telegraph wires and electric mains of all descriptions whether overhead or underground and the Grantee ~~s~~ shall not erect any building in such a way as to cover or interfere with any existing alignments of main or service pipes or telephone or telegraph wires and electric mains.
12. The Commissioner of Lands reserves the right to ~~revis~~ ~~the~~ annual ground rental payable hereunder after the expiration of the thirty-third and sixty ~~year~~ ~~years~~ of the term hereby granted. Such rental will be at the rate of ~~per cent~~ per cent of the unimproved freehold value of the land as assessed by the Commissioner of Lands.
12. The Commissioner of Lands reserves the right to revise the annual ground rent payable hereunder on 31st December, 1998 and thereafter at the expiration of every ten years of the term.

GPK 1822-1a-973



IN WITNESS WHEREOF I, WILSON GACANJA )  
the Commissioner of Lands have by )  
order of the President hereunto set )  
my hand this 8<sup>th</sup> day of September )  
One thousand nine hundred and ninety )  
eight in the presence of: )

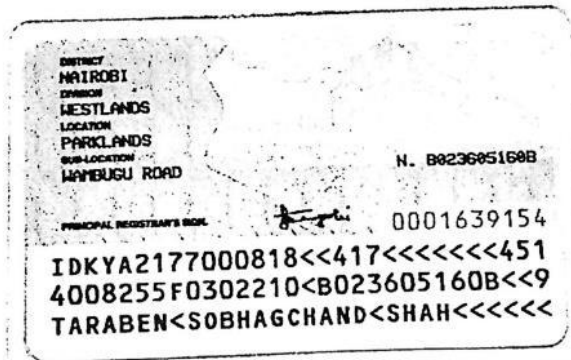
*Wilson Gacanja*



LAND TITLE REGISTRY - NAIROBI HQ  
REGISTRATION OF TITLES ACT  
REGISTERED AS No. LR 77920/1  
PRESENTED 15<sup>th</sup> September 1998  
T.M. 155/98 *W. Gacanja*  
Registrar of Titles



CERTIFIED TRUE COPY  
OF THE ORIGINAL  
P. J. KAKAD  
ADVOCATE / COMMISSIONER  
FOR OATHS / NOTARY PUBLIC



**INCOME TAX DEPARTMENT**  
PERSONAL IDENTIFICATION NUMBER CERTIFICATE

**PIN :** A002544669E

**NAME :** SHAH TARABEN SOBHAGCHAND

**DATE OF BIRTH :** 25/08/40

**PLACE OF BIRTH :** MOMBASA

**Date :** 04/11/97

**FORM PIN 1**

**COMMISSIONER OF INCOME TAX  
MOMBASA**

**CERTIFIED TRUE COPY  
OF THE ORIGINAL**

**P. J. KAKAD**  
ADVOCATE / COMMISSIONER  
FOR OATHS / NOTARY PUBLIC





**INCOME TAX DEPARTMENT**  
PERSONAL IDENTIFICATION NUMBER CERTIFICATE



**PIN:** A002483797H  
**NAME:** SHAH NISHUL SOBHAGCHAND  
**DATE OF BIRTH:** 13/03/74  
**PLACE OF BIRTH:** NAIROBI

**Date:** 23/10/96



FORM PIN 1


GPK (L)

CERTIFIED TRUE COPY  
OF THE ORIGINAL

P. J. KAKAD  
ADVOCATE / COMMISSIONER  
FOR OATHS / NOTARY PUBLIC

2.Change of User Approval

Invoice Number: INV-CU-AAE778 PRN: PPA-CU-AAE778



**FORM P.P.A. 2**

**THE PHYSICAL PLANNING ACT (NO. 6 OF 1996)**

**NOTIFICATION OF APPROVAL OF DEVELOPMENT PERMISSION**

To Christopher Nicholas Omare,  
59541-00200 nrb.

Your application, PPA-CU-AAE778 , submitted on 21 September 2021

Seeking permission for **Change of use (New)** from **Single dwelling unit** to **Commercial cum residential (Apartments)** on L.R/Plot no **209/1790/1**

Situated in **Parklands ,Road Off Kipkabus Road**

Was approved by the County Planning Committee held on **2021-10-08** .

Under **Item 59** Subject to the following/appended conditions:


- i.) Submission of satisfactory building plans within three years otherwise the approval lapses.
- ii) Payment of revised ground rent as will be determined by the Director of Valuation,Ministry of Lands and Physical Planning
- iii) Payment of revised rates as will be determined by the Director Valuation & Property Management - Nairobi City County
- iv) Subject to the plot not constituting part of the disputed public/private utility land/allocations
- v) Subject to compliance with Sections 36, 41 and 52 of the Physical Planning Act
- vi) Subject to compliance with the approved zoning policy
- vii) Subject to provision of appropriate setback(s) as per the rezoning plan
- viii) Subject to provision of adequate and functional on site parking to the satisfaction of Director of Roads, Public Works & Transport
- x.) Subject to commercial development being limited to ground floor only
- xv) Subject to the proposed development maintaining the requisite of 3m, 6m, 9m building line as per the statutes
- xxvi) Subject to the development maintaining the residential character and densities of the area

Date of Issue 02 November 2021	Signed
	Name
	For: Chief Officer - Urban Planning
cc:	<i>The Chairman National Land Commission , Nairobi</i>
	<i>The Director of Physical Planning, Nairobi</i>
	<i>The Director of Surveys, Nairobi</i>



(r.15(2))

FORM 7

  
**nema**  
mazingira yetu | ubali wetu | wajibu wetu

**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)**  
**THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

**ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE**

License No : NEMA/EIA/ERPL/14748  
Application Reference No: NEMA/EIA/EL/19016

M/S **LUCY WANGARI**  
(individual or firm) of address  
P.O. Box 2167, Thika

is licensed to practice in the


capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Associate Expert**  
registration number **9675**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **4/20/2021**      Expiry Date: **12/31/2021**

  
Signature.....  
(Seal)  
**Director General**  
**The National Environment Management Authority**

P.T.O.

  
ISO 9001: 2015 Certified

2020/11/16 10:00:00 AM

FORM 7 (r.15(2))

  
**nema**  
nema.go.ke | info@nema.go.ke | www.nema.go.ke

**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)**  
**THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

**ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE**

License No : NEMA/EIA/ERPL/14578  
Application Reference No: NEMA/EIA/EL/18794

M/S **Beth Wangui Gitonga**  
(individual or firm) of address  
P.O. Box 1364 - 00502,Nairobi

is licensed to practice in the  
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Associate Expert**  
registration number **8219**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **3/24/2021** Expiry Date: **12/31/2021**

Signature.....  


(Seal)  
Director General  
The National Environment Management  
Authority

P.T.O.

  
ISO 9001: 2015 Certified

FORM 7

(r.15(2))



**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)  
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

**ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE**

License No : NEMA/EIA/ERPL/15930

Application Reference No: NEMA/EIA/EL/20713

M/S **JONATHAN VUNDI JOSEPH**  
(individual or firm) of address

P.O Box 17875-00100, Nairobi.

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**  
registration number **7197**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **7/29/2021**

Expiry Date: **12/31/2021**

Signature.....

(Seal)  
Director General  
The National Environment Management  
Authority

