

**INTERGRATED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT
FOR THE PTA BANK, EASTERN & SOUTHERN AFRICAN TRADE AND DEVELOPMENT
BANK PROPOSED REGIONAL OFFICE DEVELOPMENT ON L.R NO. 1/184- NAIROBI ALONG
LENANA ROAD IN KILIMANI, NAIROBI COUNTY**



PROPONENT

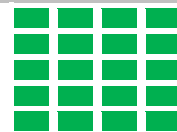


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DECEMBER 2016

SUBMISSION OF DOCUMENTATION

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I, **Prof. Jacob K. Kibwage** on behalf of Africa Waste and Environment Management Centre (AWEMAC) submit the following Environmental and Social Impact Assessment Study Report for the proposed regional office building on L.R No. 1/184- Nairobi along Lenana Road in Kilimani, Nairobi County for PTA Bank, Eastern and Southern African Trade and Development Bank. To my knowledge, all information contained in this report is an accurate and truthful presentation of all findings as relating to the proposed project.

*Signed in **NAIROBI** on this ____ day of December 2016*

Signature: _____

*Designation: **Lead Environmental Consultant. NEMA Firm Reg. No. 0527***

PROJECT PROPONENT

I, _____, on behalf of PTA Bank, Eastern and Southern African Trade and Development Bank – Nairobi Regional Office, submit the following Environmental and Social Impact Assessment Study Report for the proposed PTA Bank regional office building on L.R No. 1/184- Nairobi along Lenana Road in Kilimani, Nairobi County. To my knowledge, all information contained in this report is an accurate and truthful presentation of all findings as relating to the proposed project

*Signed in **NAIROBI** on this ____ day of December 2016*

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ACRONYMS

AWEMAC	Africa Waste & Environment Management Centre
CBD	Central Business District
EMCA	Environmental Management and Co-ordination Act
EMP	Environmental Management/Monitoring Plan
ESIA	Environmental & Social Impact Assessment
Km ²	Kilometres squared
L.R No.	Land Registration/Reference Number
M	Metres
M ²	Metres squared
NCWSC	Nairobi City Water and Sewerage Company
NEAP	National Environmental Action Plan
NEMA	National Environmental Management Authority
NET	National Environment Tribunal
OSHA	Occupational Safety and Health Act
PPE	Personal Protective Equipment
PTA	Preferential Trade Area Bank
TOR	Terms of Reference
WRMA	Water Resource Management Authority

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EXECUTIVE SUMMARY

Introduction

The Eastern and Southern African Trade and Development Bank, commonly known as PTA Bank is an African regional development financial institution established in 1985. It is a corporate body established by charter pursuant to chapter 9 of the Treaty for the establishment of a preferential trade area for the Eastern and Southern African States. The Bank's mandate is to finance and foster trade, socio-economic development and regional economic integration across its Member States. It offers a broad range of products and services, across both the private and public sectors, including debt, equity and quasi-equity as well as guarantees. PTA Bank's investments cut across agriculture, trade, industry, infrastructure, energy and tourism, among others and are made on a commercial basis and sustainability principles. Its headquarters are in Bujumbura (Burundi) with regional hubs in Nairobi (Kenya), Harare (Zimbabwe) and Ebene (Mauritius).

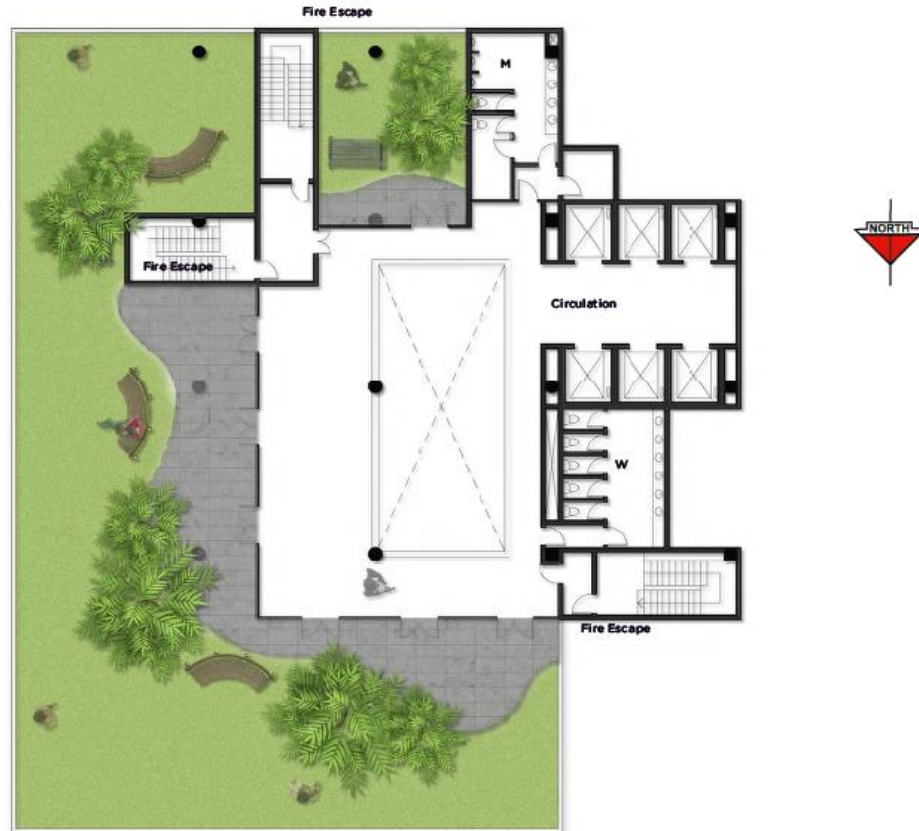
PTA Bank is proposing to construct their regional office building on property on L.R No. 1/184- Nairobi in Kilimani, along Lenana Road in Nairobi County measuring approximately 1.052 acres in Kilimani along Lenana Road approximately 300M from the Ring-road Kilimani and Lenana Road intersection. The project will consist of a nineteen (19) tower floors office block with three (3) basement levels for parking. Key project features that will enhance the projects green space include a well-landscaped plaza, and two sky gardens. The proposed project is also designed in a way that allows for passive cooling as well as natural ventilation. The proponent intends to sink a borehole on site to supplement water supply from the Nairobi City Water and Sewerage Company (NCWSC); hydrogeological studies will be conducted and a separate ESIA done for the borehole.

Upon completion, the development will be PTA Banks' regional office and will have the following features:

- Conferencing Facilities
- Office Space
- Coffee shop/ Restaurant
- A plaza
- Lettable Space
- Retail units
- Sky gardens
- Fire escapes



Figure 1: An artistic impression of the proposed development



Level 4 (Sky Garden)
Scale 1:100

Figure 2: Visual Impression of the Proposed Sky Garden

The property currently has two buildings on it; one bungalow with a detached servant quarters and a three-storey building with an attic, this building once utilized as apartments but is currently being used as office. It also has a paved car park and is connected to NCWSC water and sewage infrastructure as well as to Kenya Power electrical utilities. The vegetation on site includes a few trees and some ornamental plant species. The proposed site is bordered by Applewood Park Suites to the South, Lenana Road to the North, Camden Court to the East, North Star apartments to the West and is directly across the Sri Lankan High Commission to the North. The neighboring area is comprised of commercial premises, restaurants, schools, offices and multi-dwelling residential developments.



Figure 3: The site extents of the proposed development

The gross lettable area for the ground floor will be 617M² and will consist of a main entrance, shops, bathrooms, fire escape etc. The Mezzanine floor will have a gross lettable area of 716M² and will comprise of conference facilities, bathrooms, circulation areas, fire escape etc. There will be two sky gardens at level 3 and level 11 respectively. There will be 3 basement (comprising 6 split levels) levels in total with approximately 300 car parking spaces. The total built up area of the project will be 19,188 square meters with 75% plot coverage and a plot ratio of 2.

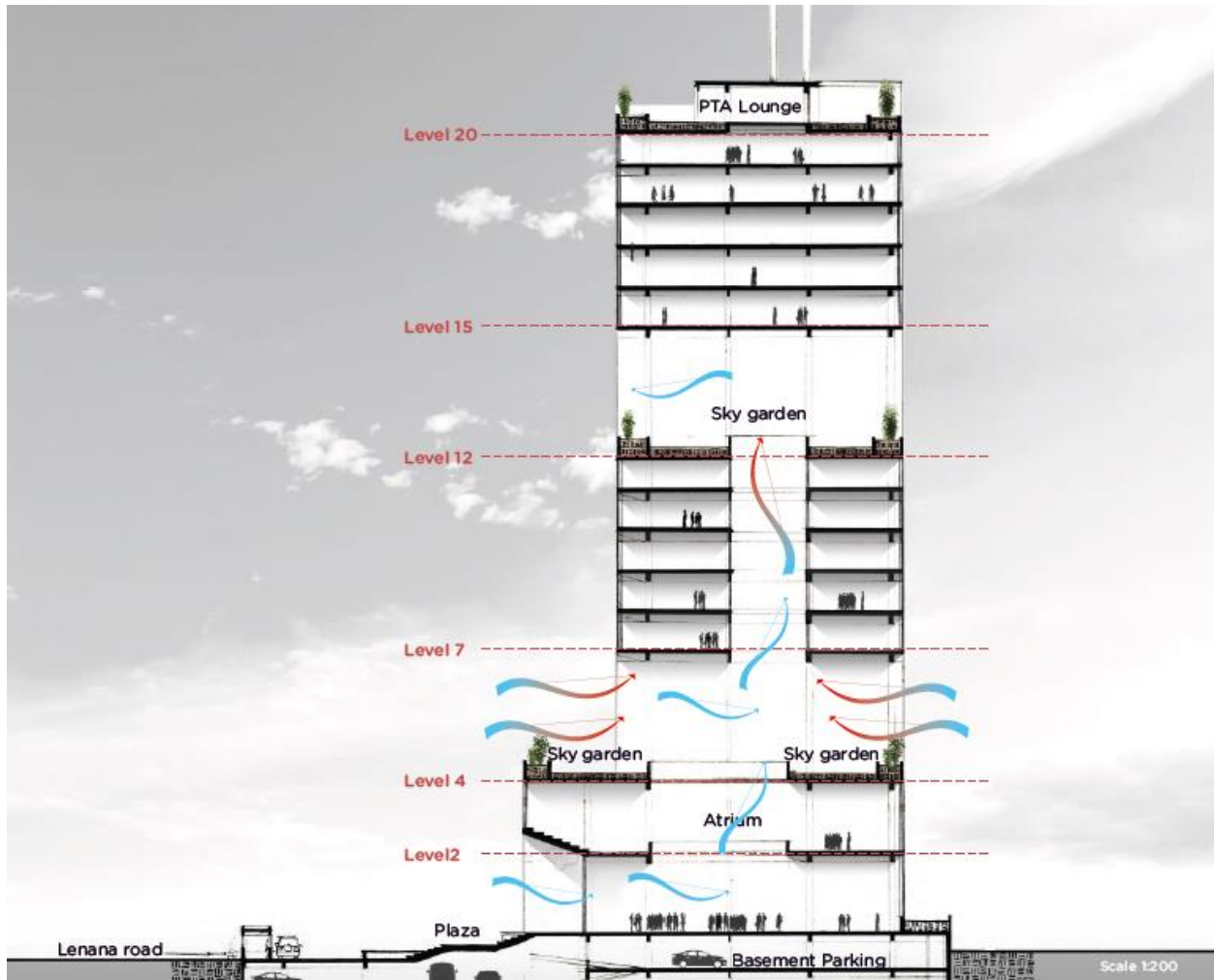


Figure 4: A longitudinal section of the proposed 19-storey building

Environmental Impact Assessment is a tool for environmental conservation and has been identified as a key component in new project implementation. According to section 58 of the Environmental Management and Coordination Act (EMCA) No. 8 of 1999-second schedule 9 (1), and Environmental (Impact Assessment and Audit) regulation, 2003, new projects must undergo Environmental and Social Impact Assessment. The Report of the same must be submitted to National Environment Management Authority (NEMA) for approval and issuance of relevant certificates. This study was undertaken to ensure all potential impacts of the proposed project are identified and appropriate mitigation measures proposed.

Scope, Objective and Criteria of the Environmental and Social Impact Assessment (ESIA)

Africa Waste and Environment Management Centre were appointed as the Consulting Firm to conduct an Environmental and Social Impact Assessment Study for the proposed project. The output of this work was an Environmental and Social Impact Assessment study report for the purposes of applying for an EIA license.

The scope of this Environmental Impact Assessment covered:

- The baseline environmental conditions of the area,
- Description of the proposed project,
- Provisions of the relevant environmental laws,
- Identification and discussion of any adverse impacts to the environment anticipated from the proposed project,
- Appropriate mitigation measures,
- Provision of an environmental management plan outline.

Methodology Outline

The general steps followed during the assessment were as follows:

- Environment screening, in which the project was identified as among those requiring Environmental Impact Assessment under schedule 2 of EMCA, 1999.
- Environmental scoping that provided the key environmental issues.
- Desktop studies and interviews.
- Physical inspection of the site and surrounding areas.
- ESIA Public participation via the use of questionnaires and a public meeting.
- Reporting.

Positive Impacts Anticipated from the Proposed Project

The proposed project will come along with numerous positive impacts including: Employment opportunities, gains in the local and national economy, increased efficiency in

services provided to the people, optimal use of land, increased emergence of social amenities and services in the area, use of best technologies that will ensure environmental and social sustainability in the project area among others.

Negative Impacts Anticipated from the Proposed Project

The proposed project will undoubtedly have some negative impacts which include air and water quality degradation, noise pollution, dust and exhaust emissions, solid waste generation, increased water demand, increased energy consumption, increased storm water flow among others. Pressure on social amenities may also result from the increased number of visitors to the proposed PTA bank regional office. Occupational safety risks associated with the development include accidents, risks of fire out-breaks, and increased vehicular traffic along Lenana Road.

Mitigation Measures for the Identified Negative Impacts

Mitigation measures to address identified negative impacts include landscaping and replanting areas where vegetation has been removed; sprinkling the soils with water if ground clearance is undertaken during the dry season; provision of appropriate Personal Protective Equipment (PPE) to the workers during construction; and, sealing of the area during construction for the safety of passers-by. During the operational phase, both solid and liquid wastes will be generated. Therefore there should be proper strategic management of both solid and liquid wastes to avoid the pollution to the environment. The proposed project is to be developed in an area that is already designated for such developments and hence, no conflict in land use is anticipated.

Conclusion

The proposed project will bring about positive effects in the project area including creation of employment, improving growth of the economy, boosting of the informal sector, optimal use of land, incorporation of collective waste management and increase in revenue among others, this will collectively contribute towards achieving Kenya's Vision 2030. It is also realized that, although the project will come with various positive impacts, some negative impacts are inevitable and the purpose of conducting this ESIA is to chart ways to mitigate them or where possible eradicate them completely. The possible negative impacts that may arise from this project include: Hydrology and water quality degradation, noise pollution, dust and exhaust emissions and generation of solid wastes among others.

Based on the above and taking cognizance of the fact that the proponent has proved financially and environmentally credible, it is our recommendation that the project be allowed to go on provided the mitigation measures outlined in this report are adhered to

and the Environmental Management Plan (EMP) is implemented to the latter. An initial environmental audit will also be carried within a period of 12 months after commencement of the operations to check compliance to the set policies, standards and laws and the proponent will contract a licensed firm to provide Environmental Health and Safety Services for the construction phase of the proposed development.

1. INTRODUCTION

1.1 Background and Rationale for an Environmental and Social Impact Assessment

The proponent PTA Bank owns property measuring approximately 1.052 acres in Kilimani along Lenana Road approximately 300m from the Ring-road Kilimani and Lenana Road crossroad junction. The bank is proposing to construct their regional office building on L.R No. 1/184- Nairobi in Kilimani, along Lenana Road in Nairobi County. The site is 1.052 acres and the project will consist of a nineteen (19) tower floors office block with three (3) basement levels for parking. Key project features that will enhance the projects green space include a well-landscaped plaza, and two sky gardens on level 3 and level 11 respectively. The proposed project is also designed in a way that allows passive cooling as well as natural ventilation. The proponent intends to sink a borehole on site to supplement water supply from the Nairobi City Water and Sewerage Company (NCWSC); hydrogeological studies will be conducted and a separate ESIA done for the borehole.

Upon completion, the proposed development will house the PTA Banks' regional office and will include the following:

- Conferencing Facilities
- Office Space
- Coffee shop/ Restaurant
- A plaza
- Retail units
- Sky gardens
- Water Features
- Fire escapes
- Circulation

The proposed site currently has two buildings on it one bungalow with a detached servant quarters and a three storey building with an attic, this building was once utilized as apartments but is currently being used as an office. It also has a paved car park and is connected to water, sewage and electrical utilities. The vegetation on site includes *Euonymus fortune*, *Casuarinas equisetifoli*, *Lantana Camara*, and *Psidium guajava*.

The proposed site is bordered by Applewood Park Suites to the South, Lenana Road to the North, Camden Court to the East, North Star apartments to the West and is directly across the Sri Lankan High Commission to the North. The area is characterized by: commercial premises, restaurants, schools, offices and multi-dwelling residential developments.

1.2 Terms of Reference (TOR) for the ESIA Process

The consultant on behalf of the proponent conducted the assessment by incorporating the following terms of reference:

- The proposed location of the project
- A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
- The objectives of the project.
- The technology, procedures and processes to be used, in the implementation of the project.
- The materials to be used in the construction and implementation of the project.
- The products, by-products and waste to be generated by the project.
- A description of the potentially affected environment.
- The environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
- Analysis of alternatives including project site, design and technologies.
- 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.
- Provide an action plan for the prevention and management of the foreseeable accidents and hazardous activities in the cause of carrying out development activities.
- Propose measures to prevent health hazards and to ensure security in the working environment for the employees, residents and for the management in case of emergencies.
- An identification of gaps in knowledge and uncertainties, which were encountered in compiling the information.
- An economic and social analysis of the project.
- Such other matters as the Authority may require.

1.3 ESIA Organization and Structure

The Consultant (Lead Expert) coordinated the day-to-day functions and any related institutional support matters. Otherwise, all formal communications were directed to NEMA through PTA Bank.

1.3.1 Responsibilities and Undertaking

The Consultant undertook to meet all logistical costs relating to the assignment, arranged for own transport and travels during the exercise. PTA Bank provided a contact person(s) to provide information required by the Consultant. The proponent also provided site plan(s) showing buildings layout, actual sizes of the site, details of raw materials, operation

permits and conditions, land-ownership documents and site history, and estimated investment costs.

The output from the consultants includes the following:

- An Environmental and Social Impact Assessment Study Report comprising of an executive summary, study approach, baseline conditions, anticipated impacts and proposed mitigation measures,
- An Environmental Management Plan Outline, which also forms part of the report recommendations.

1.3.2 Data Collection Procedures

First, the Consultant undertook environmental screening and scoping to avoid unnecessary data. The data collection was carried out through questionnaires distributed door to door, standard interview schedules, use of checklists, observations and photography, site visits, a public meeting and desktop environmental studies where necessary in the manner specified in Part V (section 31-41) of the Environmental (Impact Assessment and Audit) Regulations, 2003.

1.3.3 Methodology Outline

Due to the scale of the proposed project and in line with guidelines issued by NEMA, an environmental and social impact assessment was deemed to be necessary. The general steps followed during the assessment were as follows:

- Environment screening, in which the project was identified as among those requiring Environmental Impact Assessment under schedule 2 of EMCA, CAP 387
- Environmental scoping that provided the key environmental issues
- Desktop studies and interviews
- Physical inspection of the site and surrounding areas
- ESIA Public Participation Meetings and
- Reporting.

1.3.3.1 Environmental Screening

This step was applied to determine whether an Environmental Impact Assessment was required and what level of assessment was necessary. This was done in reference to requirements of the EMCA, CAP 387, and specifically the second schedule. Issues considered included the physical location, sensitive issues and nature of anticipated impacts.

1.3.3.2 Environmental Scoping

The scoping process helped to narrow down into the most critical issues requiring attention during the assessment. Environmental issues were categorized into physical, natural/ecological and social, economic and cultural aspects.

1.3.3.3 Desktop Study

This included documentary review on the nature of the proposed activities, project documents, designs policy and legislative framework as well as the environmental setting of the area among others. It also included discussions with managers and design engineers as well as interviews with neighbouring communities.

1.3.3.4 Site Assessment

Field visits were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts. It also included further interviews with members of the surrounding community.

1.3.3.5 ESIA Public Participation

The residents/ property owners surrounding the project site were interviewed and they expressed their views towards the upcoming project. In addition to that, questionnaires were administered to solicit for more details and views from the surrounding community. A public meeting was held on 24th November 2016 at the proposed site from 2:30pm to 4:00pm where attendants further aired their views and concerns, which were addressed by the consultants and the client's representatives present. The public notice, minutes of this meeting and attendance sheets are appended to this report.

1.3.3.6 Reporting and Documentation

The Environmental and Social Impacts Assessment Study Report was compiled in accordance with the guidelines issued by NEMA for such works and was prepared and submitted by the proponent for review and approval prior to submission to NEMA. The Consultant took into consideration all the views and concerns that had been raised by interested and/or affected parties and recommended appropriate mitigation measures. The Consultant also ensured constant briefing of the client during the exercise. Architectural drawings, summarized bill of quantities and the PTA bank Charter are appended to this report.

2 DESCRIPTION OF THE PROJECT

2.1 Introduction

The proponent PTA Bank has put forth a proposal to construct their regional office building on L.R No. 1/184- Nairobi in Kilimani, along Lenana Road in Nairobi City County. The site measuring approximately 1.052 acres is in Kilimani along Lenana Road and is 300m from the Ring-road Kilimani and Lenana Road intersection.

2.2 Description of the Project

The gross lettable area for the ground floor will be 617M² and will consist of a main entrance, shops, bathrooms, fire escape etc. The Mezzanine floor will have a gross lettable area of 716m² and will comprise of conference facilities, bathrooms, circulation areas, fire escape etc. There will be two sky gardens at level 3 and level 11 respectively. There will be 3 basement (comprising 6 split levels) levels in total with approximately 300 car parking slots.



Figure 5: Floor plan for the 2nd storey of the proposed 19-storey development

2.3 Location and Size of the Project

The proposed development will be on L.R No. 1/184- Nairobi in Kilimani, along Lenana Road approximately 300m from the Ring-road Kilimani and Lenana Road crossroad junction. It can be accessed from Lenana Road or alternatively from Ring-Road Kilimani Road, onto Lenana Road. Other access roads are Argwings Kodhek road to Galana road onto Lenana road and Argwings Kodhek road to Wood Avenue onto Lenana road. The proposed project will have 75% plot coverage and will consist of:

- 19 above ground floors
- 8,165 M² lettable area*
- 9,720 M² gross floor area
- 300 basement parking spaces

The GPS of coordinates of the property are:

- 1.290059 S, 36.784872 E
- 1.290145 S, 36.784384 E
- 1.289522 S, 36.784303 E
- 1.289484 S, 36.784784 E



Figure 6: Site layout of the proposed development

2.4 Project's Surrounding

The project area has for a long time consisted of mostly single dwelling residential developments but in recent years this has changed to include a blend of both multi-dwelling developments and commercial, recreational and institutional premises. Notable developments, which are similar in nature, include Yaya centre and Sifa Towers along Ring road Kilimani, K-Rep Centre along Wood Avenue, Galana Plaza along Galana road and ACS Plaza along Lenana road. The proposed development will therefore fit into the existing neighborhood with no violation of the physical planning zoning specifications. Further to this, the proponent acquired land that was already changed from residential to commercial use.

There are also other ongoing construction projects within the vicinity.



Plate 1: Similar on-going construction projects along Lenana road

2.5 Description of the Project's Construction Activities

2.5.1 Demolitions

Demolitions of the existing 3-storey structure and a bungalow are expected at the site during construction.



Plate 2: A bungalow on the property set for demolition



Plate 3: A 3-Storey building on the property set to be demolished

2.5.2 Excavation and Foundation Works

Excavation will be carried out to prepare the site for construction of foundations, pavements and drainage systems. The excavation will involve the use of heavy earthmoving machinery such as excavators and bulldozers.

2.5.3 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 quotas. Materials such as cement, paints and glass among others will be stored in temporary storage structures built for this purpose.

2.5.4 Masonry, Concrete Work and Related Activities

The construction of the building walls, foundations, floors, pavements, drainage systems, perimeter fence landscaping among other components of the project involves a lot of masonry work and related activities. General masonry and related activities include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labor intensive and are supplemented by machinery such as concrete mixers, cranes etc.

2.5.5 Structural Steel Works

The development will be reinforced with structural steel for stability. Structural steel works involve steel cutting, welding and erection of formwork.

2.5.6 Roofing Works

Roofing activities will include raising the roofing materials such as tiles and structural steel to the roof and fastening the roofing materials to the roof.

2.5.7 Electrical Works

Electrical work during construction of the premises will include earthing, electrical wiring, installation of lighting fixtures etc. In addition, there will be other activities involving the use of electricity such as welding and metal cutting.

2.5.8 Plumbing

Installation of pipe-work will be done to connect the development to the NCWSC sewer line. Plumbing will also be done for drainage of storm water from the rooftop into the

storm water drainage. Plumbing activities will include metal and plastic pipe cuttings, the use of adhesives, metal grinding and wall drilling among others.

2.6 Description of Project's Operational Activities

2.6.1 The Facility Users

The facilities to be constructed by the proponent, when completed will serve as the regional PTA Bank office. There will be no major restaurants and night clubs in the building.

2.6.2 Landscaping

The site will be landscaped after construction, using plant species available locally. This will include, tree-planting, establishment of flower gardens and grass lawns to improve the visual quality of the site.

2.6.3 Electrical System

The proposed development will be connected to the Kenya Power Company electricity main line of, which will be used in all phases of the project. The necessary guidelines and precautionary measures relating to the use of electricity shall be adhered to.

2.6.4 Water Reticulation System

Water from a borehole supplemented by water from the Nairobi City Water and Sewerage Company (NCWSC) will be used during the construction and operation phases of the project. A separate ESIA will be conducted for this. There will be water storage tanks to increase water capacity at the project site to the required amount.

2.6.5 Solid Waste Management

Solid waste management will consist of collection by segregation of waste by type from the various sources and these will be collected at designated points. The waste will later be collected for disposal by a NEMA registered refuse collector.

2.6.6 General Repairs and Maintenance

The proposed development 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, repair and maintenance of electrical gadgets, painting and replacement of worn out materials among others.

2.7 Description of the Project's Decommissioning Activities

2.7.1 Demolition Works

Upon decommissioning, the project components including buildings, pavements, drainage systems, parking areas and perimeter fence will be demolished. This will produce a lot of solid waste, which will be re-used for other construction works or if not re-usable, disposed of appropriately by a licensed waste disposal company.

2.7.2 Dismantling of Equipment and Fixtures

All equipment including electrical installations, furniture, finishing fixtures 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 these 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.

2.7.3 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 top soil and re-vegetation using indigenous plant species.

2.8 Estimated Project Investment Cost

The project is estimated to cost USD Thirteen Million Eight Hundred and Twenty Two Thousand, Nine Hundred and Eighty One and Ninety Six Cents (USD 13,822,981.96) which is the equivalent of Kshs One Billion, Four Hundred Million, Two Hundred and Sixty Eight Thousand and Seventy Two and Fifty Five Cents (Kshs. 1,400,268,072.55).

This project is categorized as a high risk project in line with legal notice No. 150 of EMCA 1999, second schedule, because the built up area exceeds 10,000 square metres. As provided for in the legal notice No. 149 of EMCA, 1999 on fees and levies, projects within this category are subject to an EIA license fee of 0.1% of the total project cost with a minimum of Kshs. Fifty Thousand and a maximum of Kshs. Forty Million. Therefore, the EIA license fee payable for this project is USD 13,823 (Thirteen Thousand Eight Hundred and Twenty Three Dollars) which is equivalent to Kshs. One Million Four Hundred Thousand, Two Hundred and Sixty Nine and Ninety Cents (Kshs 1,400,269.90) as per the exchange rate of 101.3 as at 24th October 2016 which is the date of payment of the NEMA fee.

3 BASELINE INFORMATION OF THE STUDY AREA

3.1 Introduction

The project site is located in Kilimani, within Nairobi County approximately 5 km from the Nairobi Central Business District (CBD). The property measures approximately 1.052 acres and is located along Lenana Road approximately 300M from the Lenana-Ring Road Kilimani Junction.

The property currently has two buildings on it; a brick clad 3-storeyed office block with an attic built and a bungalow with detached servant's quarters made of concrete and stone bricks and clay roofing tiles. The office block is currently being used for file storage whereas the bungalow is currently unoccupied. It also has a paved car park and there are a few trees and some ornamental plant species. There are two points of entry/exit from the property both located along Lenana road. The Property is bordered by Applewood Park Suites to the Southern end of the property, Lenana Road to the Northern end of the property and Camden Court to the East and North Star apartments to the West. The neighboring area is occupied mainly by human settlement, commercial premises and social amenities; including restaurants, schools, offices and multi-dwelling residential developments.

The GPS of coordinates of the property are:

- 1.290059 S, 36.784872 E
- 1.290145 S, 36.784384 E
- 1.289522 S, 36.784303 E
- 1.289484 S, 36.784784 E



Plate 4: A bungalow on the property set for demolition



Plate 5: A 3-Storey building on the property set to be demolished



Plate 6: A view from the southern end of the property, of the buildings to be demolished



Plate 7: Camden Court, a residential property located east of the proposed project site



Plate 8: Apple Wood Park, an office complex located south of the proposed project site

3.2 Administrative Framework

Kilimani is a 16.1Km² suburb in Nairobi that is developing into a major commercial and economic area outside the Central Business District of Nairobi. Apart from being a commercial center, Kilimani is also one of the five County Assembly wards in Dagoretti North Constituency, one of the 17 electoral constituencies in Nairobi County. The other four County Assembly wards constituting Dagoretti North constituency are Kawangware, Gatina, Kileleshwa and Kabiro. Kilimani is also one of the six subdivisions (locations) in Westlands administrative division.

3.3 Climate

The project area enjoys moderate cool climatic conditions. The altitude makes for some chilly evenings, especially in the June-July season when temperature can drop less than 10°C. The period between December and March is the sunniest and warmest with temperatures averaging the mid-twenties during the day. The mean annual temperature is 17°C and the mean daily maximum and minimum are 24°C and 12°C, respectively, (Chandler, 1971). There are two rainy seasons but rainfall can be moderate. The long rains form the first season and fall in the months of March to May, and the short rains forming the second rainy season, fall between October and December. The cloudiest part of the year is just after the first rainy season, when, until September, conditions are usually overcast

with light drizzles. The mean annual rainfall ranges between 850- 1050mm. As Nairobi is located close to the Equator, the differences between the seasons are minimal.

3.4 Humidity

Because of Nairobi's location just south of the equator in combination with humid air pumped in from the Indian Ocean, the humidity values for each day are generally on the higher end. This is not to say that values are always high, since the easterly winds coming off the Indian Ocean tend to keep the temperatures standard throughout the country; therefore the "warm sticky" feeling is usually not associated with Nairobi as much as one would think. In the summer to autumn months of January to April, relative humidity values have been known to plummet to anywhere from 10% to 20%. The typical day, humidity-wise, starts off with nearly saturated in the morning hours, and steadily decreases throughout the remainder of the day.

3.5 Infrastructure and Transport

The proposed PTA Bank regional office site is accessible from Ring Road Kilimani onto Lenana Road or alternatively from Argwings Kodhek Road via Galana Road or Wood Avenue onto Lenana Road. Lenana Road lies on the Western side of Nairobi and has a 2-lane, 6M carriageway, this might potentially cause traffic increase which may lead to congestion on the road during project construction and operational phases which may in turn affect other roads serving the area. Owing to this and because the proponent upholds the welfare of the general public, it is recommended that a traffic engineer be contracted to design a traffic management plan for the proposed development and to curb as well as devise ways to deal with any future traffic issues that may arise both during construction and the operational phases of the development.

There are footpaths and street lighting on this road along the subject length of this study.

Due to rapid urban growth, provision of basic infrastructure for all has become an important concern of development planners in Nairobi. Basic infrastructural services that have deteriorated due to such rapid increase in population include: Solid Waste Management (SWM) system; Water and Sewerage Systems; Drainage and flood protection; Roads; Mass transportation; Electric Installations; and Telecommunications. Greater environmental pollution, congestion and problems have been the result of under-provision of such basic services.

Nairobi city is well served with good communication and transport network such as air, road, and railway. It is centrally located to serve the Eastern African Countries. Bus and Train stations are within an easy walk of the City centre. The existing metre gauge Railway line runs from Mombasa through Nairobi to Malaba and a Standard Gauge Railway from

Mombasa to Malaba is currently under construction. On air transport, Jomo Kenyatta International Airport makes it easy to transport goods from all over the world into the country and vice versa.

Energy in its various forms is used to varying degrees, but by far the most common is electricity, wood fuel supplemented by fossil fuels is used by relatively few residents. Other sources of energy such as solar, wind and biogas are also used, though rarely.



Plate 9: A section of Lenana road that is adjacent to the proposed project site



Plate 10: Electrical infrastructure passing along Lenana Road

3.6 Water and Sanitation

94% of the piped water supply for Nairobi comes from rivers and reservoirs in the Aberdare Range north of the city, of which the reservoir of the Thika Dam is the most important one. Water distribution losses – technically called non-revenue water are 40%, and only 40% of those with house connections receive water continuously. Slum residents receive water through water kiosks and end up paying much higher water prices than those fortunate enough to have access to piped water at their residence. The major source of water is The Nairobi City Water and Sewerage Company supplemented by water from private boreholes. Kilimani has the potential for underground water use by digging boreholes to substitute other sources of water supply. The proposed project site will utilize water from a borehole but prior to it being sunk, a hydrogeological survey will be conducted and an application made to WRMA after which an Environmental and Social Impact Assessment (ESIA) will be conducted.

3.7 Biological Diversity

a) Flora

Natural vegetation in the area has been highly compromised by human settlement and other anthropogenic activities. The project area is covered with scattered exotic species and ornamental plants. Some of the plant species observed in the project area include the

Euonymus fortunei- Emerald 'n gold, *Casuarinas equisetifolia*- Casuarina, *Cupressus spp*- Cypress, *Lantana Camara*, grass among others. The vegetation within the proposed site does not merit special conservation status since it is of least biological and cultural importance. However, the proponent will implement a landscaping plan upon completion of construction and it is recommended that indigenous tree species be utilized.



Plate 11: Some of the vegetation at the project site

b) Fauna

No animal species were observed at the property.

3.8 Demography

In the year 1901, an estimate of about 8,000 people lived in Nairobi. By 1948, the number had grown to 118,000 and by 1962; the city had a population of 343,500 people. From the 2009 census estimates, recorded city's population had risen to 3.363 million and an overall population density of 3,079 people per square kilometer (Source: KNBS Census). A growing economy and swelling population numbers from both in-migration and natural growth are continually increasing the city's population size.

Kilimani is a middle income neighborhood with a population of about 43,122 persons according to the 2009 national census. It is one of the few neighborhoods in which residents can live, work, school, shop and be entertained. Kilimani is rapidly becoming a high density suburb where utilities are in danger of being overstrained.

Nairobi's large and growing population is one of the main forces driving the city's overwhelming environmental challenges. Ongoing rural to urban migration, high natural birth rates, and poor/inappropriate city planning conspire to continue degrading the city's water and air quality. In turn, environmental degradation has impacts on human health and the economy.

3.9 Economic Activities

The major economic activities in Kilimani include formal and informal businesses. Some of the investments in the city are residential and office complexes. The area also is a home of a number of foreign embassies and high commissions for example the Sri Lankan high commission, Nigerian High Commission, Chinese embassy, Ethiopian embassy and the South Africa High Commission. Due to its location near the Nairobi CBD, Kilimani provides numerous opportunities for trade at various scales. Because of these characteristics, it contributes to Nairobi being considered the commercial centre for Kenya and even East Africa. Owing to its huge economic potential, economic activities within the proposed project site are Insurance brokers, Media, Consultancy, Shopping malls, Estate holdings, and Academic Institutions.



Plate 12: Commercial developments adjacent to the project site

4 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 Introduction

Environmental impact assessment is a tool for environmental conservation and has been identified as a key component in new project implementation. According to section 58 of the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, second schedule 9 (1), and Environmental (Impact Assessment and Audit) regulations, 2003, both new and old projects must undergo Environmental Impact Assessment and Audits. The report of the same must be submitted to the National Environmental Management Authority (NEMA) for approval and issuance of the relevant certificates.

There is a growing concern in Kenya and at global level that many forms of development activities cause damage to the environment. Development activities have the potential to damage the natural resources upon which the economy is based. Environmental Impact Assessment is a useful tool for protection of the environment from the negative effects of developmental activities. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound.

4.2 Relevant Kenya Policies

The policies that are relevant to the proposed development project include:

4.2.1 National Environment Policy (Sessional Paper No. 10 of 2014)

This Policy proposes a broad range of measures and actions responding to key environmental issues and challenges. It seeks to provide the framework for an integrated approach to planning and sustainable management of natural resources in the country. It recognizes the various vulnerable ecosystems and proposes various policy measures not only to mainstream sound environmental management practices in all sectors of society throughout the country but also recommends strong institutional and governance measures to support achievement of desired objectives and goals .

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

This policy was formulated on the basis of the National Environment Action Plan (NEAP) process of 1994. Its major objective is to harmonize environmental and developmental concerns to ensure sustainability. Furthermore, this policy ensures that environmental issues are taken into consideration before the commencement of development policies, programmes, plans and projects. The proposed project is therefore consistent with the Sessional Paper No. 6 of 1999.

4.2.3 Physical Planning Policy

The current policy governs the development and approval of all building plans as provided for in the Physical Planning Act (Cap 286). The proposed project will be subjected to the provisions of this policy and legislation.

4.2.4 Public Health Policy

The prevailing public health policy calls upon the project proponent to ensure that buildings are adequately provided with utilities so that they are fit for human habitation. The proposed development has been designed by competent professionals and as such will have all amenities/utilities that are essential for safeguarding public health for all people using the facilities.

4.2.5 The Kenya National Climate Change Response Strategy

The purpose of this strategy is to put in place robust measures needed to address most of the challenges posed by climate variability and change through thorough impact assessments and monitoring of various projects. According to climate change projections, in Kenya, we are likely to experience hotter drier sunny seasons, warmer wetter rainy seasons, rise in sea levels and an increase in extreme weather events. These climatic changes will impact on our daily lives and the buildings that we work and live in must be adapted to cope with such changes. With time both existing buildings and the construction of new buildings will have to adapt to cope with the conditions climate change may produce. A range of new ways to design, construct, upgrade and occupy buildings so that they are more energy efficient as well as resilient to threats such as flooding and drought is proposed. In the construction sector, priority inclusion areas should include energy efficient innovations and technologies, and utilization low-carbon appliances and tools; the utilization of eco-friendly energy resources such as wind, solar, biogas, etc; as well as possible utilization of biofuels.

4.2.6 Kenya Vision 2030

The Economic Pillar of Vision 2030 seeks to improve the prosperity of all regions of the country and all Kenyans and as such the development blueprint recognizes projects such as the Proposed PTA Bank regional offices building to be a necessary pre-requisite in attaining the Kenya's Vision 2030.

Moreover, Environment cleanliness and security is ensured via protection and conservation of sensitive areas such wetlands, wildlife corridors and migratory routes which can be done by conducting project Environmental and Social Impact Assessments and developing of comprehensive mapping of land use patterns in Kenya.

4.3 Institutional Arrangements

Environmental and Social Impact Assessment (ESIA) is a methodology used to identify the actual and probable impacts of the projects and programmes on the environment and to recommend alternatives and mitigating measures. The assessment is required at all stages of project development with a view to ensuring environmentally sustainable development for both existing and proposed public and private sector development ventures. The National EIA regulations were issued in accordance with the provisions of Environmental Management and Coordination Act (EMCA) of 1999. The EIA Regulations must be administered, taking into cognizance provisions of EMCA 1999 and other relevant national laws. The intention is to approve and license only those projects that take into consideration all aspects of concern to the public as they impact on health and the quality of the environment.

4.4 Institutional Framework

4.4.1 National Environmental Management Authority

The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. A Director- General heads NEMA. The Authority shall:

- Co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plan, programmes and projects with a view to ensuring the proper management and rational utilization of the environmental resources 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 conservation, with the relevant lead agencies.
- Audit and determine the net worth or value of the natural resources in Kenya and their utilization and conservation.
- Make recommendations to the relevant authorities with respect to land use planning.
- Examine land use patterns to determine their impact on the quality and quantity of the natural resources.
- Advise the government on legislative and other measures for the management of the environment or the implementation of relevant international conservation treaties and agreements in the field of environment as the case may be.

- Advise the government on regional and international environmental convention treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements where Kenya is a party.
- Undertake investigation and surveys in the field of environment and collect and disseminate information about the findings of such research, investigation or survey.
- Mobilize and monitor the use of financial and human resources for environmental management.
- Identify projects and programmes or types of projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under EMCA.
- Initiate and evolve procedures and safeguards for the prevention of accidents, which may cause environmental degradation and evolve remedial measures where accidents occur.
- Monitor and assess activities, including activities being carried out by relevant lead agencies in order to ensure that the environment is not degraded by such activities, environmental management objectives are adhered to and adequate early warning on impending environmental emergencies is given.
- Undertake, in co-operation with relevant lead agencies programmes intended to enhance environmental education, public awareness and public participation.
- Develop, publish and disseminate manuals, codes or guidelines relating to environmental management and prevention or abatement of environmental degradation.
- Render advice and technical support, where possible to entities engaged in natural resources management and environmental protection.
- Prepare and submit to the Cabinet Secretary every two years, a report on the state of the environment in Kenya and in this regard may direct any lead agency to prepare and submit to it a report on the state of the sector of the environment under the administration of that lead agency.
- Encourage voluntary environmental conservation practices and natural resource conservancies, easements, leases, payments for ecosystem services and other such instruments and in this regard, develop guidelines.
- Work with other lead agencies to issue guidelines and prescribe measures to achieve and maintain a tree cover of at least ten percent of the land area of Kenya; and
- Perform such other functions as government may assign to the Authority or as are incidental or conducive to the exercise by the authority of any or all of the functions provided under EMCA.

However, NEMA's mandate is designated to the following committees:

4.4.2 National Environmental Complaints Committee

The committee performs the following functions:

- Investigate any allegations or complaints against any person or against the authority in relation to the condition of the environment in Kenya and on its own motion, any suspected case of environmental degradation and to make a report of its findings together with its recommendations thereon to the Council.
- Prepare and submit to the Council periodic reports of its activities which shall form part of the annual report on the state of the environment under section 9 (3).
- Undertake public interest litigation on behalf of the citizens in environmental matters and
- To perform such other functions and exercise such powers as may be assigned to it by the council.

4.4.3 National Environment Tribunal

This tribunal guides the handling of cases related to environmental offences in the Republic of Kenya. If disputes to this project arise, they are supposed to be presented here for hearing and legal direction.

4.4.4 National Environmental Action Plan

The NEAP for Kenya was prepared in mid 1990s. It 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 the conservation of natural resources are an integral part of societal decision-making.

4.5 Legal framework

There are several legal provisions on environmental protection, which touch on and regulate developments like the one under this proposal. A summary of the various legislations relevant to the development is given hereunder. The following pieces of legislation and regulations are applicable to the proposed development.

4.5.1 The Environmental Management and Coordination Act, CAP 387

The Act defines the legal and administrative co-ordination of the diverse sectoral initiatives in the field of environment. The Act harmonizes the sector specific legislations touching on the environment in a manner designed to ensure greater protection of the environment. The day-to-day enforcement falls under the Director General of the National Environmental

Management Authority. Thus (NEMA) enforces the Act on behalf of the Cabinet Secretary responsible for Environment. Its functions include: -

- The coordination of various environmental management activities;
- Initiation of legislative proposals;
- Research, investigations, and surveys on the field of environment;
- Creation of environmental education and awareness programmes;
- Advise the government on regional and international agreements to which Kenya is party to;
- Executing the Environmental Impact Assessment (EIA) under the Environmental Impact (Assessment and Auditing) regulations, 2003, among other duties.

Under EMCA, 1999 there are a number of regulations geared towards sustainable development. The applicable regulations to the PTA bank development project are discussed below.

4.5.1.1 Environmental Management and Coordination of Controlled Substances Regulations, 2007 (Legal Notice No.73 of 2007)

The Controlled Substances Regulations defines controlled substances and provides guidance on how to handle them. This regulation mandates NEMA to monitor the activities of persons handling controlled substances, in consultation with relevant line ministries and departments, to ensure compliance with the set requirements. Under these regulations, NEMA will be publishing a list of controlled substances and the quantities of all controlled substances imported or exported. The list will also indicate all persons holding licenses to import or export controlled substances, with their annual permitted allocations.

The regulations stipulate that controlled substances must be clearly labeled with among other words, "Controlled Substance-Not ozone friendly" to indicate that the substance or product is harmful to the ozone layer. Advertisement of such substances must carry the words, "Warning: Contains chemical materials or substances that deplete or have the potential to deplete the ozone layer."

Producers and/or importers of controlled substances are required to include a material safety data sheet. Persons are prohibited from storing, distributing, transporting or otherwise handling a controlled substance unless the controlled substance is accompanied by a material safety data sheet. Manufacturers, exporters or importers of controlled substances must be licensed by NEMA. Further, any person wishing to dispose of a controlled substance must be authorized by NEMA. The licensee should ensure that the controlled substance is disposed of in an environmentally sound manner. These regulations

also apply to any person transporting such controlled substances through Kenya. Such a person is required to obtain a Prior Informed Consent (PIC) permit from NEMA.

4.5.1.2 Environmental Management and Coordination (Environmental Impact Assessment and Audit) Regulations, 2003

Environmental Impact Assessment (EIA) is a critical examination of the effects of a project on the environment. The goal of an EIA is to ensure that decisions on proposed projects and activities are environmentally sustainable. An EIA is conducted in order to identify impacts of a project on the environment, predict likely changes on the environment as a result of the development, evaluate the impacts of the various alternatives on the project and propose mitigation measures for the significant negative impacts of the project on the environment.

The EMCA, 1999 requires that during the EIA process a proponent shall in consultation with the Authority seek views of persons who may be affected by the project or activity through posters, newspaper, radio and hold at least three public meetings with the affected parties and communities. The Project proponent pays for the entire EIA process. The fee payable to NEMA is 0.1% of the project cost.

Environmental Audit (EA) is the systematic documentation, periodic and objective evaluation of activities and processes of an on-going project. The goal of EA is to establish if proponents are complying with environmental requirements and enforcing legislation. The purpose of EA is to determine the extent to which the activities and programs conform to the approved environmental management plan. A comprehensive EA ensures a safe and healthy environment at all stages of project operations and decommissioning.

An initial environmental audit and a control audit are conducted by a qualified and authorized environmental auditor or environmental inspector who is an expert or a firm of experts registered by the Authority. In the case of an on-going project the Authority requires the proponent to undertake an initial environmental audit study to provide baseline information upon which subsequent environmental audits shall be based.

Self-Audits are carried out after the environmental impact assessment study report has been approved by the Authority or after the initial audit of an on-going project. The proponent shall take all practical measures to ensure the implementation of the environmental management plan by carrying out a self-auditing study on a regular basis.

This Report complies with the requirements of the Environmental Regulations in the coverage of environmental issues, project details, impacts, legislation, mitigation measures, management plans and procedures. The Proponent shall be required to commit to

implementing the environmental management plan laid out in this report and any other conditions laid out by NEMA.

4.5.1.3 Environmental Management and Coordination (Water Quality) Regulations, 2006

Water Quality Regulations apply to water used for domestic, industrial, agricultural, and recreational purposes; water used for fisheries and wildlife purposes, and water used for any other purposes. Different standards apply to different modes of usage. These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources. The objective of the regulations is to protect human health and the environment. The effective enforcement of the water quality regulations will lead to a marked reduction of water-borne diseases and hence a reduction in the health budget.

The regulations also provide guidelines and standards for the discharge of poisons, toxins, noxious, radioactive waste or other pollutants into the aquatic environment in line with the Third Schedule of the regulations. The regulations have standards for discharge of effluent into the sewer and aquatic environment. While it is the responsibility of the sewerage service providers to regulate discharges into sewer lines based on the given specifications, NEMA regulates discharge of all effluent into the aquatic environment.

Everyone is required to refrain from any actions, which directly or indirectly cause water pollution, whether or not the water resource was polluted before the enactment of the Environmental Management and Coordination Act (EMCA) Gazetted in 1999. It is an offence to contravene the provisions of these regulations with a fine not exceeding five hundred thousand shillings.

4.5.1.4 Environmental Management and Coordination (Waste Management) Regulations, 2006

The then Minister for Environment and Natural Resources gazetted these regulations in 2006. These Regulations may be cited as the Environmental Management and Coordination (Waste Management) Regulations, 2006. Waste Management Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to protect human health and the environment. Currently, different types of waste are dumped haphazardly posing serious environmental and health concerns. The regulations place emphasis on waste minimization, cleaner production and segregation of waste at source.

4.5.1.5 Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009

These Regulations determine that no person or activity shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered:

- Time of the day;
- Proximity to residential area;
- Whether the noise is recurrent, intermittent or constant;
- The level and intensity of the noise;
- Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and,
- Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise.

These regulations also relate noise to its vibration effects and seek to ensure no harmful vibrations are caused by controlling the level of noise. Any person(s) intending to undertake activities in which noise is suspected to be injurious or endangers the comfort, repose, health or safety of others and the environment, must make an application to NEMA and acquire a license subject to payment of requisite fees and meeting the license conditions. Failure to comply with these regulations attracts a fine of KES 350,000 or 18 months jail term or both.

4.5.1.6 Environmental Management and Coordination (Air Quality) Regulations, 2008

The objective of this regulation is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources, including as mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, 1999. It also covers any other air pollution source as may be determined by the Cabinet Secretary in consultation with the Authority. Emission limits for various areas and facilities have been set. The regulations provide the procedure for designating controlled areas, and the objectives of air quality management plans for these areas. The following operations (provided they are not used for disposal of refuse), are exempt from these regulations:

- Back-burning to control or suppress wildfires;
- Fire fighting rehearsals or drills conducted by the Fire Service Agencies;

- Traditional and cultural burning of savannah grasslands; and
- Burning for purposes of public health protection.

4.5.2 The Traffic Act, 2012

The Traffic Act, 2012 gives provisions and guidelines that govern the Kenya roads transport sector. These guidelines are essential to private, public and commercial service vehicles in ensuring safety and sanity on the roads hence ensuring the environment; the human being a component is safeguarded. In section 41 The Act demands for installation and certification of speed governors for the commercial vehicles ferrying goods adjusted to the loading condition of such vehicles to a limit of 80 KPH, registration and competence of drivers. Moreover, the owner of commercial vehicles or trailer shall ensure clear markings on their vehicles in English language on the right side of the vehicle showing ownership details, tare weight of vehicle and maximum authorized weight. Section 26 and 27 of the same discourages engines that emit exhaust gases to the atmosphere without passing via a silencer or expansion chamber. In ensuring safety of all the persons in transit, section 56 encourages that every public and commercial vehicle be fitted with inspected and first class first aid box and fire extinguisher. In ensuring compliance to this Act, the contractor and developer shall ensure that all site drivers and all material suppliers to the site satisfy the provisions as stipulated in the Act.

4.5.3 Public Health Act (Cap. 242)

Part IX, section 115, of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires 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 human health. Such nuisance or conditions are defined under section 118 as waste pipes, sewers, drainers 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.

4.5.4 Urban and Cities Act No 13 of 2011

The Act came into function with regard to Article 184 of the Constitution providing regulations on the classification, governance and management of urban areas and cities and further providing the criteria of establishing urban areas. Part III of the Act gives the regulations and functions of every city or municipality with regard to integrated development plans, which shall include but not limited to environmental plans and disaster preparedness, within the area of jurisdiction in achieving objectives of devolved governments under section 174 of the constitution while maintaining the socio-economic rights of the people. Moreover, in the first schedule, the Act enlists the services that any

municipality/ City shall provide to its residents which include but not limited to traffic control and parking, water and sanitation, refuse collection, solid waste management, pollution abatement services among others. The Nairobi City County Planning and Environment Department have been actively involved in the planning of this development from its initial stages.

4.5.5 The Environment and Land Court Act, 2011

This Act is in place to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. This Act shall be of great essence to the proponent, public, interested or affected party that may want to litigate against the development on settlement issues, location of project or even effects of the project to the public.

4.5.6 The National Land Commission Act, 2012(No. 5 Of 2012)

Section 5 of the Act outlines the Functions of the Commission, pursuant to Article 67(2) of the Constitution as follows 5(1):-

- To manage public land on behalf of the national and county governments;
- To recommend a national land policy to the national government;
- To advise the national government on a comprehensive programme for the registration of title in land throughout Kenya;
- To conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities;
- To initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress;
- To encourage the application of traditional dispute resolution mechanisms in land conflicts;
- To assess tax on land and premiums on immovable property in any area designated by law; and
- To monitor and have oversight responsibilities over land use planning throughout the country.

4.5.7 The Land Act, 2012

This is an ACT of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes. The Land Act of 2012 subsection (1) states that 'any land may be converted from one category to another in accordance with the provisions of this Act or any other written law.'

4.5.8 The Land Registration Act, 2012

The Land Registration Act is placed to revise, consolidate and rationalize the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes. This Act applies to Subject to section 4, this Act shall apply to:

- Registration of interests in all public land as declared by Article 62 of the Constitution;
- Registration of interests in all private land as declared by Article 64 of the Constitution; and
- Registration and recording of community interests in land.

Section 24 states that: (a) the registration of a person as the proprietor of land shall vest in that person the absolute ownership of that land together with all rights and privileges belonging or appurtenant thereto; and (b) the registration of a person as the proprietor of a lease shall vest in that person the leasehold interest described in the lease, together with all implied and expressed rights and privileges belonging or appurtenant thereto and subject to all implied or expressed agreements, liabilities or incidents of the lease.

4.5.9 Privileges and Immunities Act (Cap. 179)

The Act is meant to amend and consolidate the law on diplomatic and consular relations by giving effect to certain international conventions and otherwise; to consolidate the law relating to the immunities, privileges and capacities of international organizations of which Kenya is a member and of certain other bodies; and for matters incidental to and connected with the foregoing. Section 7 of the Act gives the Cabinet Secretary power to confer immunities or privileges which are conferred by or may be conferred and any such order may provide for extending, in relation to premises, official archives, communications, documents and personal property of persons on whom immunities and privileges are or may be conferred. Article 22 of the Vienna Convention on Diplomatic Relations which is in the first schedule of the act states the following:

1. The premises of the mission shall be inviolable. The agents of the receiving state may not enter them, except with the consent of the head of the mission.
2. The receiving State is under a special duty to take all appropriate steps to protect the premises of the mission against any intrusion or damage and to prevent any disturbance of the peace of the mission or impairment of its dignity.
3. The premises of the mission, their furnishings and other property thereon and the means of transport of the mission shall be immune from search, requisition, attachment or execution.

The proponent shall undertake appropriate measure to ensure there is no disturbance of the peace of the neighbouring Sri Lankan High Commission located directly opposite the proposed project site.

4.5.10 The Standards Act Cap. 496

The Act is meant to promote the standardization of the specification of commodities, and to provide for the standardization of commodities and codes of practice; to establish a Kenya Bureau of Standards, to define its functions and provide for its management and control. Code of practice is interpreted in the Act as a set of rules relating to the methods to be applied or the procedure to be adopted in connection with the construction, installation, testing, sampling, operation or use of any article, apparatus, instrument, device or process. The developer has to comply with the provisions of the Act to ensure the overall safety of the development by ensuring strict vetting of material to be used in the construction. Thorough scrutiny of these material and frequents monitoring will be done by the construction supervisory staff on site such the Resident Engineers, EHS and Clerk of Works office.

4.5.11 Water Act, 2002

The Water Act, 2002 provides the legal framework for the management, conservation, use and control of water resources and for the acquisition and regulation of right to use water in Kenya. It also provides for the regulation and management of water supply and sewerage services. In general, the Act gives provisions regarding ownership of water, institutional framework, national water resources, management strategy, and requirement for permits, state schemes and community projects. Part IV of the Act addresses the issues of water supply and sewerage. Specifically, section 59 (4) of the Act states that the national water services strategy shall contain details of:

- Existing water services
- The number and location of persons who are not being provided with basic water supply and basic sewerage
- Plans for the extension of water services to underserved areas
- The time frame for the plan; and
- An investment programme

Part II, section 18, of the Water Act 2002 provides for national monitoring and information system on water resources. Following on this, sub-section 3 allows the Water Resources Management Authority (WRMA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may require to be kept by a facility operator and the information thereof furnished to the Authority. The proponent and all the allied stakeholders to the project

shall ensure proper water use, management and conservation. During borehole drilling WRMA shall be consulted by the project hydro geologists for the purpose of attaining permits for borehole sinking.

4.5.12 The Energy Act of 2006

The Energy Act 2006 was enacted on 2nd January 2007. The Act establishes an Energy Regulatory Commission mandated to perform all functions that pertain to energy production, transmission, setting and enforcing of energy policies, Public education and enforcing energy conservation strategies, prescribing the energy licensing process and issuing of licenses that pertain to energy sector in Kenya. Section 30 of the Act provides the factors that shall be taken into consideration prior to issuance of license. It states the need and expression of an entity to conserve and protect the environment and natural resources in accordance to the Environmental and Coordination Act of 1999 (No. 8 of 1999), moreover, the Act gives provisions for the need to protect health and safety of users of energy by providing an enabling environment of operation that protects the health and safety of users of the service for which the license or permit is required and other members of the public affected by the undertaking. The provisions of this Act have and will be enforced by the proponent in consultation with the project EHS experts, planners and electrical consultants in ensuring the best practices are ensured for sustainable energy use while attaining public health and safety.

4.5.13 Physical Planning Act (Cap. 286)

An Act of Parliament to provide for the preparation and implementation of physical development plans and for connected purposes enacted by the Parliament of Kenya Under this Act, no person shall carry out development within the area of a local authority without a development permission granted by the local authority under section 33. The local authority concerned shall require the developer to restore the land on which such development has taken place to its original condition within a period of not more than ninety days. If on the expiry of the ninety days' notice given to the developer such restoration has not been effected the concerned local authority shall restore the site to its original condition and recover the cost incurred thereto from the developer. The developer has ensured this is affected and enforced at the initial stage.

4.5.14 Building Code 2000

Section 194 requires that where sewer exists, the occupants of the nearby premises shall apply to the Local Authority for a permit to connect to the sewer line and all the wastewater must be discharged into sewers. The proponent will dully make the necessary application to the NCWSC for the connection of the sewer to the proposed development.

4.5.15 Employment Act No 11 of 2011

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations and federations. Its purpose is to promote sound labour relations through freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute the protection and promotion of settlement conducive to social justice and economic development for connected purposes. This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the housing sector. The developer, the contractor and the employee relationship during the construction and later phases of this project shall be guided by this Act.

4.5.16 Penal Code Act (Cap. 63)

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

4.5.17 Occupational Safety and Health Act (OSHA 2007)

Before any premises are occupied or used, a certificate of registration must be obtained from the chief inspector. The occupier must keep a general register. The Act covers provisions for health, safety and welfare.

Health

The premise must be kept clean, daily removal of accumulated dust from floors, free from effluvia arising from any drain, sanitary convenience or nuisance and without prejudice to the generality of foregoing provision.

A premise must not be overcrowded, there must be in each room 10 meters of space for each employee, not counting space 14 feet from the floor and a 9 feet floor-roof height. The circulation of fresh air must secure adequate ventilation of workrooms. There must be sufficient and suitable lighting in every part of the premise in which persons are working or passing. There should also be sufficient and suitable sanitary conveniences separate for each sex, must be provided subject to conformity with any standards prescribed by rules. Food and drinks should not be partaken in dangerous places or workrooms.

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 exposure to wet or to any injurious or offensive substances.

Safety

Fencing of premises and dangerous parts of other machinery is mandatory. Training and supervision of inexperienced workers, protection of eyes with goggles or effective screens must be provided in certain specified processes. Floors, passages, gangways, stairs, and ladders must be soundly constructed and properly maintained and handrails must be provided for stairs. Special precaution against gassing is laid down for work in confined spaces where persons are liable to overcome by dangerous fumes. Air receivers and fittings must be of sound construction and properly maintained. Adequate and suitable means for extinguishing fire must be provided in addition to adequate means of escape in case of fire.

Welfare

An adequate supply of quality and wholesome drinking water must be provided. Maintenance of suitable washing facilities, accommodation for clothing not worn during working hours must be provided. Sitting facilities for all female workers whose work is done while standing should be provided to enable them take advantage of any opportunity for resting. Section 42 stipulates that every premise shall be provided with maintenance, readily accessible means for extinguishing fire and person trained in the correct use of such means shall be present during all working periods. Section 45 states that regular individual examination or surveys of health conditions of industrial medicine and hygiene must be performed and the cost will be met by the employer. This will ensure that the examination can take place without any loss of earning for the employees and if possible within normal working hours. Section 55B provides for 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 illness including disabling during working hours, are adhered. The proponent will ensure that safety is put first through by contracting an on-site EHS officer who will ensure adherence to proposed EHS best practices and ESMP recommendations on all sections of the development.

The proposed development shall ensure compliance to all these legal provision throughout the projects lifecycle.

5 PUBLIC PARTICIPATION

5.1 Introduction

Public consultation and participation process is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated by EMCA CAP 387 section 58, on Environmental Impact Assessment for the purpose of achieving the fundamental principles of sustainable development. Therefore, this chapter describes the process of the public consultation and public participation followed to identify the key issues and impacts of the proposed the commercial development in Nairobi County. The objective of the consultation and public participation was to:

- Disseminate and inform the stakeholders about the project with Special reference to its key components and location.
- Gather comments, suggestions and concerns of the interested and affected parties about the project.
- Incorporate the information collected in the ESIA study

In addition, the process enabled,

- 1) The establishment of a communication channel between the general public and the team of consultants, the project proponents and the Government.
- 2) The concerns of the stakeholders be known to the decision-making bodies at an early phase of project development

5.2 Objectives of the Consultation and Public Participation

The objective of the consultation and public participation was to:

- 1) Disseminate and inform the public and stakeholders about the project with Special reference to its key components and location
- 2) Create awareness among the public on the need for the EISA 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

In addition, the process enabled the establishment of a communication channel between the general public and the team of consultants, the project proponents and the Government; and the concerns of the stakeholders to be known to the decision making bodies at an early phase of project development.

5.3 Methodology used in Public Consultation

The exercise was conducted by a team of experienced registered environmental experts. The following process in carrying out the entire process involved:

- Key informant interviews and discussions
- Field surveys, photography and observations
- Completion of the pre-designed questionnaires which captured all the phases of the proposed development

The purpose for such interviews was to identify the positive and negative impacts and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively. It also helped in identifying any other miscellaneous issues, which may bring conflicts in case project implementation proceeds as planned. The information gathered enabled the identification of the specific issues from the stakeholders' response, which provided the basis upon which the aspects of the Environmental Impact and Social Assessment was undertaken.

5.4 Sources of Information

The exercise of public consultation was conducted on 3rd October 2016 and on the 24th November 2016 around the proposed project site. The exercise was conducted via interviews (house to house) under the guidance of questionnaires developed to capture the concerns, comments and issues that the stakeholders, neighbours and business people around the project site have regarding the proposed Commercial Development. The completion of such questionnaires allowed for the synthesis and analysis of issues that arose. The first public participation exercise was conducted on 3rd October 2016 where questionnaires were administered to a total number of thirty seven (37) stakeholders as attached in the annexes. From this process key information on the concerns by local residents was collected. A public meeting was further planned in order to also get the views of the major stakeholders and have the concerns on the local residents addressed. The public meeting was successfully conducted on 24th September 2016 at the proposed project site (a copy of the public notice, attendance sheet for the twenty nine (29) stakeholders present and minutes has been appended to this report). A total of sixty six (66) stakeholders were actively consulted during this study.

The list of participants who were interviewed is shown in the **table 1** below.

Table 1: List of public meeting participants

	NAME	ORGANIZATION/RESIDENCE	PHONE NUMBER/ EMAIL ADRESS
1	ROBERT MOTENDE	CATHOLIC JUSTICE AND PEACE DPI-KENYA	0727733084
2	YVONNE MORAA	LOCAL RESIDENT	0729750804
3	ANAB MOHAMED	LOCAL RESIDENT	0706115218
4	ELPHAS AYIDAYE	A.C.S PLAZA	0721204344
5	MIKE MAKOZI	CIVIL ENGINEERING DESIGN (K) LTD- CONSULTANT	0721669740
6	WANJIRU KANYIHA	INUKA KENYA	wkanyiha@inukakenya.com
7	BERNARD BONUKE	K&M ARCHPLANS LIMITED	0723250003
8	MICHAEL KINYOMU	PLANNING SYSTEMS	michael.kinyumu@planning-kenya.com
9	ERICK LOKI	PLANNING SYSTEMS	Erick.loki@planningkenya.com
10	DAVID GAMBO	LOCAL RESIDENT	0728430611
11	OCHOKO BROHNE	LOCAL RESIDENT	ochakobrohin@gmail.com
12	JOSEPH KYALO	CHESTER COURT	0701523482
13	SHEM OKELO	WOOD AVENUE COURT	0790497847
14	ELIZABETH LAWSON	CAMDEN COURT	0733856396
15	MUKWA WASWA	PENSOFT SYSTEMS	0721528857
16	ALEX LUNGALA	NORTHSTAR DEVELOPERS	0726489953
17	BRIAN KETER	EMROK TEA FACTORY (EPZ) LTD	bryanketer@gmail.com
18	JOSEPH MUTIE	TELLUX AFRICA LIMITED	0723488250
19	AMOS MWAURA	VODA NETWORK SYSTEMS	0725525675

20	WHITNEY OCHIENG	NAIROBI RESIDENT	0702168183
21	SIMON KISAKA	NAIROBI RESIDENT	0713401109
22	TERRY AOKO	SEEDS OF PEACE AFRICA	0720850440
23	KIFLE HAMZA	PTA BANK	0734522894
24	VINCENT OCHIENG	CONSULTANT	0722387997
25	FELIX ONDURU	GEDOX ASSOCIATES	felix@gedox.net
26	CHEGE WAINAINA	CHEGE WAINANA &CO ADVOCATES	chegewainainaadvocates@gmail.com
27	DR.GEORGE KARUTHI	VODA NETWORKS SYSTEMS	0722872966
28	ONYANCHA MONGERI	NAIROBI RESIDENT	0723536281
29	PROF J.K KIBWAGE	AWEMAC ESIA LEAD EXPERT	0722479061
30	JOYCE WANGARI	AWEMAC ESIA FIELD ASSISTANT	0728101868
31	FAITH WAMBUI	NAIROBI RESIDENT	0714293432
32	SAMUEL MACHARIA	NAIROBI RESIDENT	0718725249
33	KABURU EVA	AWEMAC	0728631589

5.5 Stakeholders Public Meetings

Consultative public meeting was held during the field exercise on 24th November 2016 to consolidate the issues affecting the project as well as capturing issues raised by the project affected persons. The local residents, Proponent and Major Stakeholders were in attendance during the meeting (See **Appendix J** for a sample public notice). Various issues were captured and addressed during the meeting as it is reflected in the minutes attached in the report. See **Appendix F and G** for the minutes and attendance lists of public meeting respectively.

From the field work, and the public meeting it was apparent that the proposed development was received with mixed reactions by the interviewed people as they anticipated numerous impacts both negative and positive alike. The local community people, neighbors, and major stakeholders independently gave their views, opinions, and

suggestions as in the best of their interest and in the interest of the factors that affected the circumstances, influences, and conditions under which their organizations exist.



Plate 13: Members of the public asking questions during the public meeting held at the proposed project site



Plate 14: The project proponent answering questions from the public



Plate 15: The project Architect briefing members of the public

5.6 Views Raised

5.6.1 Positive Impacts

5.6.1.1 Employment Opportunities

The respondents interviewed were optimistic that the project will create numerous employment opportunities for both for skilled and unskilled labour alike from the construction phase to the operational phase. Despite the fact that most of the project will need skilled labour force, some of those interviewed expressed hope that they will be able to access employment once the project commences mostly as casual workers. The respondents were optimistic that once the project is complete, a lot of labour will be required for the new development to operate. The contractor for the project was keen to note that they will exclusively be contracting Kenyans to work in the project in all its different faces. This will be a source of income for several individuals and households and hence is expected to boost the GDP and improve the living standards of the local people.

5.6.1.2 Economic Growth

Through the use of locally available materials during the construction phase of the proposed commercial and recreational development, material such as cement, building blocks concrete and ceramic tiles, timber, sand, ballast electrical cables etc., will be bought from the suppliers within Nairobi County thereby contributing towards growth of the economy as well as living conditions of the business enterprises based on these construction materials. The consumption of these materials, fuel oil and others will attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of these raw materials will be payable directly to the producers.

5.6.1.3 Increased Business Opportunities

Those with businesses along and around the area were optimistic that the increased number of visitors and customers in the area will result in an increased customer base to their business enterprises. According to them, the number of customers will increase from the construction workers, the security and maintenance personnel including visitors who will be visiting the Commercial development during its operation phase. Other stakeholders such as Restaurants and commercial apartments expressed their joy since there will be a major increase in the customer base for their products and services.

5.6.1.4 Increased Property Rates

The contractor pointed out that once the project is operational, it will result to increase land rates and property or house rent. These will in turn increase the property values in the area should anyone wish to sell.

5.6.2 Negative Issues

5.6.2.1 Dust Emissions

The people expressed concern over possibility of generation of large amount of dust and exhaust fumes within the project site and surrounding areas as a result of construction works and transportation of construction materials. The proponent shall ensure that dust levels at the site are minimized through implementation of dust abatement techniques on unpaved, un-vegetated surfaces to minimize windblown erosion. Sprinkling water in areas being constructed and along the tracks used by the transport trucks and diversions within the site will be done. Dust nets will also be used all round the site to prevent dust from spreading to the nearby facilities. Additional mitigation measures presented within the EMP will be fully implemented to minimize the impacts of dust generation.

5.6.2.2 Noise and Vibration Pollution

The residents expressed their fears over noise pollution that would come from the construction works and the vehicles during the operation phase.

Residents were informed that maximum permissible noise levels as per the EMCA (Noise and Excessive Vibration Pollution Control) Regulations 2008 would be observed during the construction phase. In addition, vehicles and machinery to be used during the construction phase will be subjected to constant monitoring and servicing to reduce the noise levels.

It is also recommended that quieter construction machines such as jack-in piling machines, which generate about 20 dB (A) less noise than bore piling machines be utilized. It is also recommended that the proponent considers using noise control equipment such perimeter noise barriers, which can reduce noise by 5 dB (A) to 10 dB (A). When used as part of a good noise management system, these measures will be effective in reducing construction noise. Other noise control measures to be employed include:

- Limiting construction to between 8AM to 5PM on Monday to Saturday
 - Sensitize workforce including drivers of construction vehicles
 - Install sound barriers for pile driving activity
 - Install portable barriers to shield compressors and other small stationary equipment where necessary
 - Put up signs to indicate construction activities
 - Maintain all equipment
 - Workers in the vicinity of high level noise to wear safety and protective gear
- Air Pollution would be mitigated by:
- Stockpiles of earth shall be sprayed with water or covered during dry seasons.
 - Dust masks will be provided for the personnel in dust generation areas
 - Construction workers will be sensitized on pollution control measures

5.6.2.3 Traffic Congestion

The local community expressed fear over the access points to Lenana Road, they also asked that pedestrian traffic be considered. They were also concerned over the increase in traffic that the proposed facility would attract which would lead to congestion and possible accidents and traffic jams along Lenana Road due to its two way nature which would be a nuisance during the projects construction and operational phase in case of traffic.

The community was informed that the traffic Engineer had designed a Traffic Management Plan that would address all concerns raised and that pedestrian traffic would be

incorporated in the traffic management plan with safeguards and considerations for crossing points.

In addition, the architects have designed a 60 Meter slip road that will ease traffic off Lenana road to be used when cars are getting into the proposed project during rush hours once it is operational. This will avoid traffic build up along Lenana Road. The car park in the basement is designed to hold 300 cars which is sufficient enough to avoid parking along Lenana Road.

The traffic Engineer has also designed a traffic model to find ways of ensuring the access and security checks at the proposed facility do not result in buildup of traffic such as using automated access cards and car scanners during entry into the facility.

Other recommended measures include:

- Use of convex traffic mirrors
- The communication of the known road hazards through any or all of the following;
 - Information/ warning sign placement,
 - Road safety meetings with residents along Lenana Road,
 - Direct communication with affected users,
 - Advertising through the public media or flag persons.

The final traffic management plan and proposed upgrades are appended to this Environmental and Social Impact Assessment Study Report.

5.6.2.4 Solid Waste Generation

Large amounts of solid waste will be generated during construction of the project. These will include metal cuttings, rejected materials, surplus materials, surplus spoil, excavated materials, paper bags, empty cartons, empty paints and solvent containers, broken glass among others.

Some of the demolition and excavation spoil material will be rendered unusable and thus will have to be disposed of. This also applies to some of the soil/rocks, which may not be reusable after excavation processes are complete. All these materials need to be collected, transported and disposed of appropriately in approved designated areas. It is encouraged that other alternative uses of these materials should be found e.g. filling excavated areas at the site. During construction and the operational phase, designated areas for waste collection will be provided and the solid wastes will be disposed off by a NEMA registered Waste Handler, so as to ensure proper disposal.

5.6.2.5 Waste Water Management

Due to the limitation of a public sewer line and owing to the scale of the proposed development, members of the community expressed their trepidation over handling of sewerage and waste water, they were however informed that the proponent had contracted a leading Waste Water Systems Expert and they conducted exhaustive studies on the site, the proposed building plans and projected waste to be produced and from the data collected, they designed a site specific Decentralized Sewage Treatment (STP).

5.6.2.6 Increased Water and Electricity Demand

It is expected that the workers, the construction works and operation of the development will create an increased demand for water and electricity in addition to the existing demand. Some of the residents were concerned that the existing county government provided water was already limited. Water will be mostly used in the creation of aggregates for construction works and for wetting surfaces for softening or hardening after creating the formworks, watering dusty diversions and active construction sites. Residents were assured that should the contractor want to sink a borehole, he would contract a hydro geologist to conduct hydrogeological studies on how feasible or appropriate it would be to sink a borehole on the site. He would then make apply for a permit to the Water and River Management Authority (WARMA) who would review the application and decide on whether or not to issue a permit. After this process a separate ESIA process would be undertaken and NEMA will then decide on whether or not to issue an ESIA licence for the borehole.

The local community was also informed that an energy consultant would be brought on board to determine the energy requirement of the building and a new transformer shall be installed in the area to ease the power supply.

The proponent shall ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used as well as using energy saving bulbs for the project. In addition, proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. Complementary to these measures, the proponent shall monitor energy use during construction and set targets for reduction of energy use.

5.6.2.7 Health and Safety Concerns

The local residents were concerned that they would face safety issues such as pedestrians falling into excavations, injuries from materials to be used during construction noise and vibration issues. The proponent assured the residents that the area will be properly fenced

off during the construction phase as required by law. In addition there will be a Safety and Health officer present on site throughout the construction phase to address any of their grievances.

An issue on the type of residents to occupy the building was raised by some of the local residents. The proponent assured the residents that only similar businesses will occupy the building upon completion. In addition, they will vet the potential occupants to ensure that the neighborhood remains safe. The proponent also assured them that the restaurants will be quiet as they will not allow loud music and nightclubs in the building.

5.6.2.8 Lighting Issues

Some of the local residents especially the immediate neighbors were concerned that the new building would limit their light reception bringing darkness into their homes and offices. In addition there was concern on the amount of glare that would result from the new building. The Architect informed them that they had taken their concerns into consideration in the design of the building which tappers away from the bordering residential building to its East. In addition the design incorporates 20 meters of space between its neighbors to the east, 9 meters to the south and 9 meters to the west which is more than the 3meters recommended by the County Government. This will ensure that it does not block the neighboring buildings from receiving sufficient sunlight or interfere with the wind flow in the neighborhood.

The Architect also mentioned that the building shall use modern building technology in design, construction, material and equipment hence minimal disturbances such as the amount of glare reflecting onto the neighboring buildings.

5.7 Suggestions to the Proponent

The local community expressed mixed reactions about the project because on the one hand it brings a development to the area that would serve the local well and on the other hand it would change the character of the neighborhood. Those interviewed and consulted, made the following suggestions to the proponent:

- Security, during the construction and the operational phase should be given the utmost level of propriety.
- A proper solid waste management plan to be put in place during the construction and the operational phase.
- Provision of proper protective equipment to workers during construction and operational phases

- Proper waste water management systems and emergency back-ups to these systems to be put in place to ensure no effluents are discharged into the surrounding community.

6 POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES

6.1 Introduction

This section identifies the potential social and environmental impacts of the proposed project in terms of the nature, magnitude, extent and location, timing and duration of the anticipated impacts. These impacts may relate to the project design stage, construction stage or the project operation and decommissioning stage. Based on impact prediction methods, site visits and observations and the results of public consultations, both beneficial and adverse environmental impacts have been identified. Suitable mitigation measures to the negative impacts are discussed in chapter 7. These are then costed and responsibilities for their implementation assigned as appropriate within the Environmental and Social Management Plan (ESMP). Both potential negative and positive impacts have been considered during the Sitting and Construction phase, Operational Phase and Decommissioning phase.

6.2 Sitting and Construction Phase

During the sitting and construction period, there is a likelihood of having the following impacts.

6.2.1 Positive Impacts

6.2.1.1 Employment Opportunities

There will be job opportunities especially to casual workers. Employment opportunities are a benefit both in the economic and social sense. In the economic sense it means abundant unskilled labour will be used in economic production. In the social sense these young and energetic otherwise poor people will be engaged in productive employment other than remaining idle. Remaining idle may attract them into social ills like drug abuse and other criminal activities like robberies. Several workers including casual laborers, masons, carpenters, joiners, electricians and plumbers are expected to work on the site for a period that the project will start to the end. Apart from casual labour, semi-skilled and unskilled labour and formal employees are also expected to obtain gainful employment during the construction period. The proposed project, during construction phase will directly employ as a minimum the following groups:

- Supervising engineering team;
- Contractor's staff (managerial, skilled and unskilled labour force);
- Suppliers of plant, machinery, materials and essential services;
- Construction monitoring personnel from the various Government agencies.

6.2.1.2 Provision of Market for Supply of Building Materials

The project will require supply of large quantities of project materials some of which will be sourced locally in the surrounding areas. This shall provide ready market for construction material suppliers such as quarrying companies, hardware shops and individuals with such materials.

6.2.1.3 Increased Business Opportunities

The large number of project staff required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as food vendors around the project site. The project shall also attract more investments in the area such as recyclable material collection, catering and cleaning business as well as security service companies from the local community.

6.2.1.4 Increased revenue to suppliers of construction materials and utilities

This will be an opportunity for the suppliers of construction materials and other utility suppliers to create market and sell their goods. In turn this will boost their profit margin which is an advantage to their businesses. Companies such as Kenya Power Company, Nairobi City Water and Sewerage Company, Internet service providing companies will gain revenue from supply of services for construction activities. Other small businesses will also be boosted by the construction activities such as small eating cafes that will provide meals to the local construction staff.

6.2.1.5 Economic Growth

Through the use of locally available materials during the construction phase e.g. cement, steel and others; the project will contribute towards growth of the country's economy by contributing to the gross domestic product. The consumption of these materials, oil, fuel and others will attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of these raw materials will be payable directly to the producers.

6.2.2 Potential Negative Impacts

The key negative impacts identified during the construction phase of the project include:

6.2.2.1 Soil Erosion

Stripping of the vegetation will expose the top soil to agents of erosion and the movement of vehicles and machinery in the area may aggravate the problem. Soil erosion is an important problem both at its source and downstream of the development site. Lost soil

will be deposited somewhere, and the location of the deposition could alter downstream hydrology and increase flooding. It may also pose a water quality issue directly as a result of siltation and indirectly from contaminants carried with or attached to soil particles and it may also negatively affect the soil fertility of the affected land. The eroded soil particles may also clog the drainage system and increase maintenance costs.

6.2.2.2 Waste Generation (Solid and Liquid Wastes)

Sources of this waste will be rejected materials, surplus materials, surplus spoil, excavated materials, domestic waste from the site, and general waste from the offices. Poor waste management may lead to health effects, un-aesthetic appearance of the place and even increase project cost. Generated waste should be appropriately managed through: identification of the waste types; segregation into the various categories; and the establishment of suitable mechanisms for collection, storage, transfer, and final disposal.

It is recommended that demolition and construction waste be recycled or reused to ensure that materials that would otherwise be disposed of as waste are diverted for productive uses. In this regard, where possible, the proponent shall ensure that construction materials left over at the end of construction will be used in other projects rather than being disposed of. In addition, upon completion of the project, damaged or wasted construction materials including cabinets, doors, plumbing and lighting fixtures, marble and glass will be recovered for refurbishing and use in other projects. Such measures will involve the sale or donation of such recyclable/reusable materials to construction companies, local community groups, institutions and individual residents or homeowners.

6.2.2.3 Water Demand for Construction Activities

Both the workers and the construction operations will create additional demand for water in addition to the existing demand. Water will be mostly used for domestic use by the workforce, concrete mixing, curing of concrete works inter alia.

6.2.2.4 Impacts on Vegetation (Vegetation Clearing)

Removal of the vegetation within the project site environs will inadvertently result in loss of existing habitat that is established. The proponent will undertake to re-plant some of the trees and landscape the site upon decommissioning of the project.

Construction earthworks for foundation laying (for building facilities) will release dust particles into the ambient air. When a lot of dust settles on the leaves, it is bound to have negative effects on flora as it covers leaf stomata thus reducing their photosynthetic activity. Limited vegetation removal and clearing will complement the efforts on screen

planting and landscaping through re-vegetation, which will lead to improved visual quality of the area.

6.2.2.5 Air Quality

Emissions in forms of dust, particulate matter, fugitive emission and, exhaustion from project machines and equipment are anticipated during the project construction phases. These emissions emanating from trucks and construction equipment are known to have adverse impact on the environment, plant and human health including effect on the upper to lower respiratory infections and silicosis condition.

- Activities likely to generate dust include speeding of vehicles on earth surface not palliated with water, excavation of earth materials in dry sections;
- Activities likely to generate particulate matter include loose material transportation, vehicle and machines exhaust emissions, operations at the batching plant, stone crushing machines, fire among others.
- Some of the particulate matter to be generated include sand, soot, cement, gravel and murram, among others; and
- Exhaust emissions likely to be generated include smoke, hydrocarbons and nitrogenous gases among others pollutants from vehicles, machinery and equipment exhausts.

6.2.2.6 Risk of Leaks and Spills

The project equipment and vehicles will use fossil fuels and thus will require protection from leaks and spillage. Fossil fuel presents both environmental and fire risks. Release of hydrocarbons to the environment has several impacts including sub-soil and groundwater contamination; air pollution, fire and effects on human health due to dermal contact, inhalation or ingestion. However, the risks of major oil spillages occurring in the project area are minimal.

6.2.2.7 Occupational Health and Safety Issues

Potential impacts during construction include: exposure to physical hazards from the use of equipment; trips and fall hazards; rock falls/slides at high elevations and exposure to dust and noise. The uncontrolled proximity to high vehicular traffic during transportation of construction materials and equipment may be a hazard to vehicular and non-vehicular movement in and out of the access road to the site while working along the Lenana road may lead to injuries or fatalities due to traffic accidents. Other injuries or fatalities may result from workers operating equipment without adequate training or with lack of PPE or extended exposure to outdoor weather resulting in heat related lethargy.

6.2.2.8 Excessive Noise and Vibration

Levels of noise and vibrations typical of construction works will be generated at the project site during the construction phase. This noise impact is expected to be negative in the long and short-term. The major sources of noises and vibration will be construction equipment, vehicles and workers. Elevated noise and vibration levels within the site are adverse to the health and safety of the project workers, the residents, passers-by and, other persons and animal within the vicinity of the project site. The major receptors exposed to the noise are expected to be at a minimum and will include mainly the construction workers.

6.2.2.9 HIV/AIDS

The project will attract new people to the project area and increase the amount of disposable cash of the construction workers. This may lead to several repercussions leading to the spread of HIV/AIDS and/or other sexually transmitted diseases (STDs). Influx of new people to the project area especially construction workers can affect the number of new cases of HIV, because they often interfere with an otherwise stable situation but the contrary can also happen where the newcomers find themselves at higher risk.

6.2.2.10 Increased Energy Consumption

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

6.2.2.11 Surface and Ground Water Hydrology and Water Quality Degradation

Changes in surface hydrology alter the flow of water through the landscape. Construction of impervious surfaces such as parking lots, roads and buildings increase the volume and rate of runoff, resulting in habitat destruction, increased pollutant loads, and flooding. Built or paved areas and changes in the shape of the land also influence groundwater hydrology (i.e. recharge rates, flow, conditions). Project related excavation could lead to surface and ground water quality degradation. Contaminated soil or ground water in the path of the project could be disturbed by excavation resulting in a potential transfer of the contamination to surface waters. The excavated area, if linear could act as a conduit to extend groundwater contamination to new areas. Spills of hazardous materials in excavated areas could introduce contaminants to ground water. Material borrowing

activities as well as the spillover effects of such projects, which include increased demand for drinking water and increased water use, can impact water quality by contributing sediment, nutrients, and other pollutants to limit water supplies, increasing the temperature of the water, and increasing the rate and volume of runoff.

6.2.2.12 Increased Storm Water Volume

There is a likelihood of interference with the percolation and flow of storm water from the excavations, stockpiling of both spoil and construction material.

6.3 Operational Phase

Some of the impacts both positive and negative that may be as a result of the proposed project during the operation stage will include;

6.3.1 Positive Impacts

It is anticipated that the operations phase of this project will result in the following positive impacts:

6.3.1.1 Employment Opportunities

This is one of the long-term major impacts of the proposed development that will be realized after construction and during the operation and maintenance of the facility. These will involve working crew such as housekeepers, receptionist, cooks, and security guards among other ancillary staff as may be required.

6.3.1.2 Ease of Access to Facilities

The proposed development will give access to facilities like shops, banking halls, parking spaces, conference facilities and restaurants which will improve the accessibility to the required services in the area.

6.3.1.3 Optimal use of the Land

The proposed development will ensure that the land available is fully optimized through the 3 basements and the 19 floors development.

6.3.1.4 Increased Business Opportunities for Goods and Service Providers

During the operation phase of the project, it will create opportunities for provision of goods and services that will be needed by the clientele and to ensure smooth operation and

maintenance of the project. Services will include telecommunication services, internet provision and cleaning services.

6.3.2 Negative Impacts

The potential negative impacts likely to occur during the operations and maintenance phase of the project include:

6.3.2.1 Solid Waste Generation

The quantities of solid waste to be generated by the users of the offices and other facilities provided within the complex are expected to be significant. Such waste will include foodstuffs, empty plastic containers, cartons, waste papers, plastic bags, etc. Improper management of solid waste will result to aesthetic degradation and breeding of disease vectors. The occupants will be responsible for proper management of solid waste generated from their units during operation phase. In this regard, they are required to contract a private waste handler who is licensed by NEMA.

6.3.2.2 Occupational Health and Safety Issues

Occupation health and safety hazards during the operation and maintenance phases shall result from various sources and have adverse effects if not controlled within recommended limits. Some of the risk sources are proximity to Lenana road, use of electricity and fuel storage among others.

6.3.2.3 Increase in Water Abstraction from Underground Sources for Various Uses

The proponent proposes to source water from a proposed borehole to be dug within the project site to supplement the supply from NCWSC. The additional water sourcing from the proposed borehole would be likely to contribute to increased abstraction of ground water.

6.3.2.4 Liquid Waste Pollution

Liquid wastes from domestic waste water can result in pollution of water sources around the site, especially storm water drainage across the proposed development plot during the wet/ rainy season. Waste water will be generated from the offices, shops and the wet areas.

6.3.2.5 Air Pollution from Vehicles

Emissions from the vehicles on the roads around the project site may increase as a result of an increase in the number of vehicles accessing the completed facilities of the proposed development. The proposed basement parking may have elevated levels of vehicular emissions if design and operational controls are not put in place.

6.3.2.6 Increased Traffic Congestion

There is potential increase in road traffic on Lenana Road, Galana Road, Ring-Road Kilimani and Argwings Kodhek roads since additional vehicles for visitors and occupiers to the proposed development will be using these roads. This may aggravate the problem of traffic jams in the area.

6.3.2.7 Increased Storm Water Flow

The increased surface area of impermeable surfaces e.g. roads, pavements and roofs will increase the volume of runoff. The other potential negative impacts that may arise from the operational activities of the proposed development include;

- Water pollution
- Increased electricity consumption

6.3.2.8 Increased Pressure on Existing Infrastructure

It is recommended that the proponent liaise closely with other development partners and Government/County Departments to upgrade the existing shared facilities including roads, water distribution systems, etc. The proponent should as well explore alternative means which are environmentally sound like employing the Green Energy Technologies when and where applicable like the use of Solar Panels in water heating, among others. This will rather reduce the over dependence on fossils based energy sources which are presently threatened.

6.3.2.9 Increased Water Utilization

The proponent will install water-conserving automatic taps or push type taps. Moreover, any water leaks resulting from damaged pipes and/or faulty taps will be promptly fixed by qualified staff. In addition, the proposed development clientele will be sensitized on efficiently water utilization.

6.4 Decommissioning Phase

In the event that the property developed will be decommissioned, the primary activity is expected to be demolition and rehabilitation of the site. The following key activities should be considered:

- Noise pollution;
- Air/dust pollution;
- Liquid waste;
- Landscape design;

- Solid waste material;
- Social impacts;
- Occupational health & safety hazards

Some of the anticipated impacts during the decommissioning phase of the proposed project include;

6.4.1 Positive Impacts

The potential positive impacts during the decommissioning phase include;

6.4.1.1 Rehabilitation and Restoration of the Site

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

6.4.1.2 Employment Opportunities

Several employment opportunities will be created for the construction staff.

6.4.2 Negative Impacts

The following are the potential negative impacts;

6.4.2.1 Noise Pollution

Activities likely to produce noise during decommissioning include cutting and demolition of structures, machine operations. Mitigation measures include:

- Schedule noisy activities during the day time period;
- Use silencers on machines where possible;
- Ensure machinery is well maintained to reduce noise emitted.

6.4.2.2 Air/dust Pollution

This is expected to result from demolishing of structures at the site and the transport of demolition debris to the disposal site.

6.4.2.3 Solid Waste Material

It is expected that large amounts of solid waste material arising during demolition will include stone, wood, glass, metal, paper, plastic, equipment, vegetation, etc. The proper disposal of these materials is critical.

6.4.2.4 Occupational Health and Safety Hazards

Occupational Health and Safety hazards such as falling objects, open pits, sharp objects lying around, and dust may all be a health risk to construction workers. Risk of accidents and incidents will be heightened during the decommissioning activities as the workers will be in direct contact with heavy machinery and equipment. Health, safety and security are important aspects through all the stages of the proposed project. Excavation activities associated with the project works may lead to health and safety hazards attributed to:

- Unidentified or misidentified utilities: Workers may be exposed to hazards such as electric shock, suffocation, or explosions if they unexpectedly come in contact with utility lines such as underground HV cables.
- Hazardous atmospheres: Workers may be exposed to hazards such as suffocation, chemical exposure, or explosions, if they enter excavations with hazardous atmospheres;
- Structural instability: Structures may become unstable if excavation occurs below the base of a building or equipment pad foundations, or below retaining wall footings. This may be fatal to the workers;
- Water accumulation: Water accumulation in excavations can cause sloughing of excavation sidewalls, resulting in unsafe conditions for those entering the excavation, particularly if the use of electrical equipment is required;
- Falls: Workers or passers-by may accidentally fall into open, unprotected excavations, or vehicles may accidentally be driven into uncovered or inadequately barricaded pits.

7. ANALYSIS OF PROJECT ALTERNATIVES

This section analyses the project alternatives in terms of site, technology scale and waste management options.

7.1 Relocation Option

Relocation option to a different site is an option that is not available for the project. At present the PTA bank does not have an alternative site. This means that with no other location to relocate the project at the moment, the developer has to look for the land. Looking for the land to accommodate the scale and size of the project and completing official transaction on it may take more than three years although there is no guarantee that the land would be available.

The developer will spend another two years on design and approvals since design and planning has to be according to site conditions. Project design and planning before the stage of implementation will cost the developer billions of Kenya shillings. Whatever has been done and paid to date will be counted as a loss to the developer. Assuming the project will be given a positive response by the relevant authorities including NEMA, this project would have been delayed for about a three year period before implementation. This is a delay that our economy can ill afford. The other consequence of this is that it would be a discouragement for private/local investors. In consideration of the above concerns and assessment of the current proposed site, relocation of the project is not a viable option.

7.2 No Project Alternative

The No Project option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. The No Project Option is the least preferred from the socio-economic and partly environmental perspective due to the following factors:

- The economic status of the Kenyans and the local people would remain unchanged.
- The local skills would remain under-utilized.
- Reduced interaction both at local, national and international levels.
- No employment opportunities will be created for thousands of Kenyans who will work in the proposed development plans.
- Increased poverty and crime in Kenya.
- No hospitality services provided to alleviate the current critical shortage.
- It will discourage investors from coming up with similar developments to the area.

From the analysis above, it becomes apparent that the No Project alternative is not an option.

7.3 The proposed development alternative

Under the proposed development alternative, the developer of the proposed project would be issued with an EIA License. In issuing the license, NEMA would approve the proponent's proposed PTA bank's regional offices, provided all environmental measures are complied with during the construction period and operational phases. This alternative consists of the applicants' final proposal with the inclusion of the NEMA regulations and procedures as stipulated in the environmental impacts to the maximum extent practicable.

7.4 Analysis of Alternative Construction Materials and Technology

The proposed project will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment that saves energy and water will be given first priority without compromising on cost or availability factors. The concrete pillars and walls will be made using locally sourced stones, cement, sand (washed and clean), metal bars and fittings that meet the Kenya Bureau of Standards (KEBS) requirements.

7.5 Waste Water Management Alternatives

Five locally available technologies are discussed below:-

7.5.1 Alternative One - Use of Stabilization Ponds/Lagoons

This refers to the use of a series of ponds/lagoons which allow several biological processes to take place, before the water is released to the environment. The lagoons can be used for aquaculture purposes and irrigation. However, they occupy a lot of space and are exposed to weather and are less costly. No chemicals are used and heavy metals usually sink to the bottom and decomposition processes take place. They are usually a nuisance to the public because of smell from the lagoons. This option is not preferable in the area because it requires a lot of space which is lacking in this case and also the local community is not likely to accept the option.

7.5.2 Alternative Two - Use of Constructed/Artificial Wetland

This is one of the best methods that can be used in raising the quality of life and health standards of local communities in the area. Constructed wetland plants act as filters for toxins. The advantages of the system are that it is a simple technology with low capital and maintenance costs. However, they require space and a relatively longer time to function.

Long term studies on plant species on the site will also be required to avoid weed invasion. Hence it is not the best alternative for this kind of project. It is however possible to design very efficient constructed sub-surface wetland systems that requires very little space.

7.5.3 Alternative Three - Connection to the Sewer Line System

Connection to the sewer line option is the most viable for the proposed project since there is an existing sewer line within the vicinity of the proposed project site.

7.5.4 Alternative Four - Use of Communal Septic Tanks

This involves the construction of underground concrete-made tanks to store the sludge. The wastewater from the septic tanks is then channeled to soak pits. It is not expensive to construct septic tanks. However, septic tanks will require regular emptying in large discharge points with possibility of polluting water bodies. Given the size and magnitude of the project, this is not a viable option since the proponent will need to construct several septic tanks at different locations. This will mean use of more space and higher project cost. Hence this option is considered not viable and economical to such a big project. It is also not friendly to the environment.

7.5.5 Alternative Five - Waste Water Treatment Plant

This involves the construction of a wastewater treatment plant that uses chemicals to treat the effluents to acceptable standards. While it is expensive in the short term to construct and maintain a wastewater treatment plant, it is reliable, efficient and cost-effective in the long term. The sludge from the treatment plant can be composted and used for gardening. This is however not justified given that there is an existing sewer line near the project site. Water analysis will need to be undertaken periodically in order to ensure effectiveness of the treatment plant.

7.6 Solid Waste Management Alternatives

A lot of solid wastes will be generated from the proposed Project. An integrated solid waste management system is recommended. First, the proponent will give priority to Reduction at Source of the materials and secondly demand a solid waste management awareness program in the management and the clientele; recycling, reuse and compositing of the waste will be the second alternative in priority. This will call for a source separation program to be put in place. The recyclables will be sold to authorized waste buyers. The third priority in the hierarchy of options is combustion of the waste that is not recyclable. Finally, sanitary land filling will be the last option for the proponent to consider.

7.7 Water Supply

Water is becoming a scarce resource day by day in most parts of the country. Therefore, the proponent looked into methods of sustaining water supply.

7.7.1 Alternative one - Rain Water Harvesting

Rain water flowing into drainage systems during wet seasons will be harvested and used for various purposes. In addition, a lot of water can also be harvested from the roof of the building that will be put up on the project site. This water can be used for watering flower gardens and grass lawns, flushing toilets and general cleaning.

7.7.2 Alternative two - Tanker/Bowers Water Supply

Several commercial water supply companies operate in Nairobi. These are usually licensed by Water Resources Management Authority (WRMA) to supply water to clients when normal NCWSC water supply system is cut-off. The proponent can use these services as a supply option. However, this option is not sustainable since it's expensive and there is no guarantee of being supplied with clean water.

7.7.3 Alternative three - Drilling of a Borehole

The proponent will undertake hydro-geological studies of the proposed project site and obtain permits from the Water Resource Management Authority (WRMA). An ESIA will be conducted for purposes of obtaining a NEMA license to sink a borehole within the development. Water supply from the borehole will cover the water supply deficits experienced from other water supply sources.

7.7.4 Alternative four - Combined Water Supply

This is the option preferred by the proponent. A dedicated mains water infrastructure system is to be provided for the development. It is proposed that there will be a new water main connection to serve the development from the existing Nairobi City Water and Sewerage Company (NCWSC) main. Additional water sources to supplement that from NCWSC will comprise one borehole. The water will be conveyed to a central storage comprising of elevated and ground storage tanks to balance the fluctuating water supply and for emergencies. Nairobi Water and Sewerage Company water supply will be supplemented by a borehole.

7.8 ESIA With/Without EMP

7.8.1 Without

This scenario was based upon the assumption that the proposed development would go ahead without any environmental management plan/options being implemented. The total project impact for the scenario is on the appreciably adverse side. This shows that if the project goes ahead without EMP, the adverse impact on the existing environment would be several times that of the impact without the project. Thus, this assumption is disqualified and not applicable since the greatest challenge worldwide presently is geared towards sustainable development and sustainable use of natural resources.

7.8.2 With

If the environmental management strategies discussed in Chapter 8 is fully implemented, the adverse impact of the project would be reduced, and there will be an overall improvement in physical, chemical, biological and socioeconomic environment of the region. Therefore, the proposed activity will be beneficial for the environment of the area, provided the EMP is in place. It is clear from the above, that the proposed project would have negative effects without implementing certain environmental management strategies. If an EMP, as discussed in Chapter 8, is adopted and implemented, the adverse impacts will be reduced and the overall environmental quality of the area would improve hence this remains a preferred option.

8. ENVIRONMENTAL MANAGEMENT/MONITORING PLAN

8.1 Introduction

The proponent of the proposed project acknowledges the fact that the proposed project activities will have some impacts on the biophysical environment, health and safety of its employees and members of the public, and socio economic well-being of the local residents. Thus, the main focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a program of continuous 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.

8.2 Construction Phase Environmental Management Plan

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the construction phase the proposed project are outlined in **Table 2 below**.

Table 2: Environmental Management Plan for the Construction Phase of the proposed project

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
1. Minimize extraction site impacts and ensure efficient use of raw materials in construction				
High Demand of construction raw materials	Source building materials from local suppliers who use environmentally friendly processes in their operations	Project Management Team & Contractor	Throughout construction period	0
	Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered	Project Management Team & Contractor	Throughout construction period	500,000
	Ensure that damage or loss of materials at the construction site is kept minimal through proper storage.	Project Management Team & Contractor	Throughout construction period	200,000
	Use at least 5%-10% recycled, refurbished or salvaged materials to reduce the use of raw materials and divert material from landfills	Project Management Team & Contractor	Throughout construction period	0

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
2. Minimize vegetation and landscaped gardens disturbance at and or around construction site				
Vegetation/biodiversity disturbance	Ensure proper demarcation and delineation of the project area to be affected by construction works.	Contractor, Civil engineer & Project Management Team	1 month	400,000
	Specify locations for trailers and equipment, and areas of the site which should be kept free of traffic, equipment, and storage	Contractor	1 month	40,000
	Designate access routes and parking within the site	Civil Engineer, Architect and Project Manager	1 month	80,000
3. Reduce storm-water, runoff and soil erosion				
Increased storm water, runoff and soil erosion	Consider harvesting and recycling storm water for utilization within the project site. Disposal of storm water that will not be harvested will be via surface drain off.	The Civil Engineer, Mechanical Engineer and Project Manager	1 month	400,000

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Ensure that construction vehicles are restricted to existing graded roads to avoid soil compaction within the project site	Contractor	Throughout construction period	
	Ensure that any compacted areas are ripped to reduce run-off.	Contractor	2 months	
	Open drains all interconnected will be provided on site	Civil Engineer	Throughout construction period	70,000 per unit
4. Minimize solid waste generation and ensure efficient solid waste management during construction				
	Private waste disposal company to be contracted to transport and dispose the solid waste from site	Project Management Team, Mechanical Engineer & Contractor	Throughout construction period	

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Running an educational campaigns amongst employees, e.g. through use of posters, to encourage reuse or recycling of the solid waste	Contractor	Throughout construction period	
5. Reduce dust emissions				
Dust emission	Ensure strict enforcement of on-site speed limit regulations	Project Management Team & Contractor	Throughout construction period	7,800
	When working in in extremely dry weather ensure adequate dust mitigation measures are in place	Project Management Team & Contractor	Throughout construction period	
	Sprinkle water on graded access routes when necessary to reduce dust generation by construction vehicles	Contractor	Throughout construction period	
6. Minimization of exhaust emissions				

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
Exhaust emission	Vehicle idling time shall be minimized	Contractor	Throughout construction period	0
	Sensitize truck drivers to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas, and to switch off or keep vehicle engines at these points	Contractor	Throughout construction period	0
7. Minimization of noise and vibration				
Noise and vibration	Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used.	Contractor	Throughout construction period	5,000
	The noisy construction works to be planned to be during daytime when most of the neighbours will be at work		Throughout construction period	0

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Comply with the provisions of Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding noise limits at the workplace	Project Management Contractor	Throughout construction period	0
8. Minimization of energy consumption				
Increased energy consumption	Ensure electrical equipment, appliances and lights are switched off when not being used	Project Management Team & Contractor	Throughout construction period	0
	Install energy saving fluorescent tubes at all lighting points instead of bulbs which consume higher electric energy	Contractor	Throughout construction period	3,800

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Monitor energy use during construction and set targets for reduction of energy use.	Project Management Team & Contractor	Throughout construction period	2,400
9. Minimize water consumption and ensure more efficient and safe water use				
High water demand	Install water conserving taps that turn-off automatically when water is not being used	Contractor	One-off	10-40 % higher
	Promote recycling and reuse of water as much as possible	Contractor	Throughout construction period	5,500
	Install a discharge meter at water outlets to determine and monitor total water usage	Contractor	One-off	30,000
	Ensure taps are not running when not in use	Contractor	Throughout construction period	0

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
10. Minimize release of liquid effluent				
Generation of wastewater	Provide means for handling sewage generated by construction workers	Contractor	One-off	5,000 per Month
	Conduct regular checks for pipe blockages or damages since such vices can lead to release of the effluent onto land and water bodies	Mechanical Engineer, Contractor & Project Management Team	Throughout construction period	4,000/month
	Monitor effluent quality regularly to ensure that the stipulated discharge rules and standards are not violated	Contractor ,Mechanical Engineer & Project Management Team	Throughout construction period	4,000/month
11. Minimize occupational health and safety risks				
Approval of building plans	Ensure that all building plans are approved by the Local Authority and the local Occupational Health and Safety Office	Developer	One-off	5,000

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
Registration of the premises	Registration of the premises under the Occupational Safety and Health Act, 2007 Laws of Kenya is mandatory	Developer	One-off	5,000
General register	A general register should be kept within the facility as stipulated in Sec 122&123 of the Occupational Safety and Health Act, 2007.	Project Management Team & Contractor	One-off	1,500
Posting of abstract of Act, rules and notices	There shall be displayed at prominent places within the site the prescribed abstract of the OSHA and the relevant notices as stipulated in section 121 of the OSHA, 2007.	Project Management Team & Contractor	One-off	2,500
Incidents, accidents and dangerous occurrences.	Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction using prescribed forms obtainable from the local Occupational Health and Safety Office (OHSO) are in place.	Project Management Team Developer & Contractor	Continuous	2000/month

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Enforcing adherence to safety procedures and preparing contingency plan for accident response in addition safety education and training shall be emphasized.	The Contractor, Project Manager & Site Safety Officer	Continuous	14,400
Insurance	Ensure that the premises are insured as per statutory requirements (third party and workman's compensation)	Developer/ Contractor	Annually	-
Safety, health and environment (SHE) policy	Develop, document and display prominently an appropriate SHE policy for construction works	Project Management Team, Developer & Contractor	One-off	2,500
Health and safety committee	Provisions must be put in place for the formation of a Health and Safety Committee, in which the employer and the workers are represented	Contractor & Project Management Team	One-off	5,500
Sanitary conveniences	Suitable, efficient, clean, well-lit and adequate sanitary conveniences should be provided for construction workers	Contractor	One-off	5,000

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
Medical examination	Arrangements must be in place for the medical examination of all construction employees before, during and after termination of employment	Contractor	Continuous	500 per examination
Machinery/equipment safety	Ensure that machinery, equipment, personal protective equipment, appliances and hand tools used in construction do comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded	Project Manager, & Contractor	One-off	-
	Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain	Project Management Team & Contractor	Continuous	-
	All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury	Contractor	One-off	-

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures/operations	Contractor	Continuous	5,000 per training
	Equipment such as fire extinguishers must be examined by a government authorized person. The equipment may only be used if a certificate of examination has been issued	Contractor	Continuous	5,000 per examination
Storage of materials	Ensure that materials are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse	Contractor	Continuous	8,000
	Ensure that items are not stored/stacked against weak walls and partitions	Contractor	Continuous	-
Safe means of access and safe place of employment	All floors, steps, stairs and passages of the premises must be of sound construction and properly maintained	Project Management Team & Contractor	Continuous	-

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Securely fence or cover all openings in floors	Project Management Team & Contractor	One-off	-
	Provide all staircases within the premises with suitable handrails on both sides	Project Management Team & Contractor	One-off	-
	Ensure that construction workers are not locked up such that they would not escape in case of an emergency	Project Management Team & Contractor	Continuous	-
	All ladders used in construction works must be of good construction and sound material of adequate strength and be properly maintained	Project Management Team & Contractor	One-off	-
Emergency preparedness and evacuation procedures	Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency	Project Management Team & Contractor	One-off	5,000
	Such procedures must be tested at regular intervals	Project Management Team & Contractor	Every 3 months	5,000

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Provide measures to deal with emergencies and accidents including adequate first aid arrangements	Project Management Team & Contractor	Continuous	2,500
	Provision must be made for persons to be trained in first aid, with a certificate issued by a recognized body.	Project Management Team & Contractor	One-off	5,000
12. Ensure the general safety and security of the site and surrounding areas				
Increased Pressure on Infrastructure	Coordinate with other planning goals and objectives for the region	Architect, Project Manager, Contactor and the Developer	Continuous	5,000
	Upgrade existing infrastructure and services, if and where feasible.	Architect, Project Manager, Contactor and the Developer	Continuous	

Insecurity	Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the construction site.	Contractor & Police	Continuous	5,000
	Body-search the workers on entry, to avoid getting weapons on site, and leaving site to ensure nothing is stolen.	Contractor	Continuous	
	Ensure only authorized personnel get to the site	Contractor	Continuous	
	Security alarms will be installed	Contractor	Continuous	
13. Environmental monitoring of the project				
Environmental concern during the construction phase	Due to the magnitude of the project the proponent will liaise with the environmental consultants throughout the construction phase and ensure that the conditions of approval are adhered to.	Proponent, Contractor and AWEMAC	Throughout construction phase	-

8.3 Operational Phase EMP

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the operational phase of the project are outlined in **Table 3**.

Table 3: EMP for the Operational Phase of the proposed project

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
1 Minimization of solid waste generation and ensuring more efficient solid waste management				
Solid waste generation	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary land filling.	Proponent/Property Managers	One-off	10,000/Month
	Provide solid waste handling facilities such as waste bins and skips	Proponent/Property Managers	One-off	3,000
	Ensure that solid waste generated is regularly disposed of appropriately at authorized dumping sites	Proponent/Property Managers	Continuous	5,000/month

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Donate redundant but serviceable equipment to charities and institutions	Proponent/Property Managers	Continuous	0
	Comply with the provisions of Environmental Management and Co-ordination (Solid Waste) Regulations 2006	Proponent/Property Managers	Continuous	0
Hazardous Waste	Design and Implement a Hazardous substance control and emergency response plan	Proponent/ Environmental Consultants.	Continuous	70,000
	Adhere to Waste Management Regulations, 2006 (Legal Notice No. 121)	Proponent/ Property Managers.	Continuous	-
2 Minimize risks of liquid waste release into environment				

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
Waste water release into the environment	Provide adequate and safe means of handling liquid waste at the premises	Proponent/Property Managers	One-off	-
	Conduct regular inspections for pipe blockages or damages and fix appropriately	Proponent/Property Managers	Continuous	1000 per inspection
	Ensure regular monitoring of the sewage discharged from the project to ensure that the stipulated sewage/effluent discharge rules and standards are not violated	Proponent/Property Managers	Continuous	5000
	Comply with the provisions of Environmental Management and Co-ordination (Water Quality) Regulations 2006	Proponent/Property Managers	Continuous	0
3 Minimize energy consumption				

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
Energy Use	Switch off electrical equipment, appliances and lights when not being used	Proponent/Property Managers	Continuous	-
	Install occupation sensing lighting at various locations such as the parking areas which are not in use all the time	Proponent/Property Managers	One-off	10-40 % higher than ordinary lighting
	Install energy saving fluorescent tubes at all lighting points within the building instead of bulbs which consume higher electric energy	Proponent/Property Managers	One-off	10-40 % higher than ordinary lighting
	Monitor energy use during the operation of the project and set targets for efficient energy use	Proponent/Property Managers	Continuous	3,000/month
	Sensitize workers and the clientele to use energy efficiently	Proponent/Property Managers	Continuous	500/month

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
4 Minimize water consumption and ensure more efficient and safe water use				
Water management	Promptly detect and repair of water pipe and tank leaks	Proponent/Property Managers	Continuous	2,000/month
	Clientele and employees to conserve water.	Proponent/Property Managers	Continuous	500/month
	Ensure taps are not running when not in use	Proponent/Property Managers	Continuous	500/month
	Install water conserving taps that turn-off automatically when water is not being used	Proponent/Property Managers	One-off	10-40 % higher than ordinary taps
	Install a discharge meters at water outlets to determine and monitor total water usage	Proponent/Property Managers	One-off	Already captured.
5 Minimization of health and safety impacts				

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Kshs)
	Implement all necessary measures to ensure health and safety of workers, proposed development clientele and the general public during operation of the development as stipulated in the Occupational Safety and Health Act, 2007	Proponent/Property Managers1	Continuous	-
6 Ensure the general safety and security of the premises and surrounding areas				
	Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises	Proponent/Property Managers	Continuous	100,000/month
7 Ensure environmental compliance				
	Undertake an environmental audit within 12 months after operation commences as required by law	Africa Waste and Environment Management Centre Firm of Experts	12 months after operation commences	100,000

8.4 Decommissioning Phase

In addition to the mitigation measures provided in **Tables 2** and **3**, it is necessary to outline some basic mitigation measures that will be required to be undertaken once all operational activities of the project have ceased. The necessary objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the project are outlined in **Table 4** below.

Table 4: EMP for the Decommissioning Phase

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (KShs)
1. Demolition waste management				
Demolition waste	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3.Composting and reuse 4. Combustion 5. Sanitary land filling.	Project Management Team & Contractor	Once-off	10,000
	All buildings, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible	Project Management Team & Contractor	Once-off	10,000
	All foundations must be removed and recycled, reused or disposed of at a licensed disposal site	Project Management Team & Contractor	Once-off	5,000

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (KShs)
	Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site	Project Management Team & Contractor	Once-off	0
	Donate reusable demolition waste to charitable organizations, individuals and institutions	Project Management Team & Contractor	Once-off	0
2. Rehabilitation of project site				
Site degradation	Implement an appropriate re-vegetation program to restore the site to its original status	Project Management Team & Contractor	Once-off	0
	Consider use of indigenous plant species in re-vegetation	Project Management Team & Contractor	Once-off	0

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (KShs)
	Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent area and the development.	Project Management Team & Contractor	Once-off	0

9. CONCLUSION AND RECOMMENDATION

The ESIA study has established that the proposed PTA Bank regional office development is a worthwhile investment by the proponent and will contribute significantly to the improvement of living standards among the investors and by extension spur economic development. This will be achieved through the prior discussed positive impacts namely; growth of the economy, boosting of the informal sector during the construction phase, provision of market for supply of building materials, employment generation, increase in government revenue and optimal use of land.

The proponent of the proposed project shall be committed to putting in place several measures to mitigate the potential negative environmental, safety, health and social impacts associated with the life cycle of the proposed project. It is recommended that in addition to this commitment, the proponent shall focus on implementing the 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. It is expected that the potential positive impacts arising from the proposed development shall be maximized as much as possible. These measures will go a long way in ensuring the best possible environmental compliance and performance standards. It is our recommendation that the project be allowed to proceed provided the mitigation measures outlined in the report are adhered to, the Environmental Management Plan (EMP) is implemented and the developer adheres to the conditions of approval of the project that will be given by NEMA.

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APPENDICES

Appendix A	Copy of Land Ownership Documents
Appendix B	PTA Bank KRA PIN Certificate
Appendix C	PTA Bank Charter
Appendix D	Approved Architectural Drawings
Appendix E	Bill of quantities for the proposed project
Appendix F	Minutes of the Consultative Public Meeting
Appendix G	List of attendants for the public meeting
Appendix H	Sample of Public Consultation Questionnaires
Appendix I	AWEMAC Practicing License – 2016
Appendix J	Sample Public Meeting Notice